Underground Injection Control – Class VI Permit Application for Rose Carbon Capture and Sequestration Project Injection Wells No. 01, No. 02, and No. 03

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore LLC
Spring, TX

May 2025

FOREWORD

ExxonMobil Low Carbon Solutions Onshore LLC (ExxonMobil) submits this Underground Injection Control Class VI Permit Application (Application) to develop the Rose Carbon Capture and Sequestration (CCS) Project (Project) in Jefferson County, Texas. The Project will collect concentrated carbon dioxide (CO2) streams from third-party atmospheric emission points and route them to the Project site where three injection wells will sequester the CO2.

In accordance with the requirements of the Code of Federal Regulations, Title 40, Sections 146.82 through 146.95 [40 CFR 146.82–146.95], ExxonMobil is providing in this Application the necessary site-specific information and required evaluations to characterize the geology and predict how the CO2 plume and brine pressure front will move in the injection zone, between upper and lower shale confining zones. The information submitted in this Application also provides details on the operating strategy and design of the injection wells, testing and monitoring plan, injection well plugging and abandonment, post-injection site care and site closure, emergency and remedial response, financial assurance, and environmental justice sections of the Application.

The information and evaluations performed for the Application demonstrated that the injection zone has sufficient storage potential and a high level of certainty for protection of underground sources of drinking water. The most-significant geology features contributing to these projections are the porosity and permeability of the injection zone sands.

For these reasons and more, the Project site is ideally suited for the sequestration of CO2 within the proposed injection zone in the Fleming and Upper Frio Formations. The selected injection intervals within these formations exhibit high porosity and permeability that are ideal for CO2 storage and are “of sufficient areal extent, thickness, porosity, and permeability to receive the total anticipated volume of carbon dioxide stream” [40 CFR 146.83(a)(2)]. The upper confining zone is a thick, muddy interval in the Miocene Formation that encompasses the Amphistegina ‘B’ marker shale. The upper confining zone was measured to be 400 to 500 feet thick near the injection wells and 538 feet thick at the Project’s stratigraphic well. The Anahuac Shale is an additional confining zone within the injection zone and has proven hydrocarbon trapping characteristics.

ExxonMobil plans to cease operation of the injection wells after the CO2 storage target of 53 million metric tonnes has been achieved over a 13 year period of injection. The post-closure site care phase of the project continues the testing and monitoring plan throughout the proposed 50-year period to provide the data necessary for demonstrating no endangerment of underground sources of drinking water (USDWs). The extent of the CO2 plume is expected to stabilize by year 39 after the start of injection, at which time the rate of CO2 plume growth was predicted to be less than Claimed as PBI. Routine AoR reevaluations will occur during the active and post-closure phases of the Project to compare measured CO2 plume migration rates with model-predicted migration rates.

The strength of ExxonMobil’s financial assurance demonstration means funding for the Project will be secure throughout its lifecycle. In the rare event that underground sources of drinking water are threatened, an emergency and remedial response plan outlines the steps to be taken in accordance with the requirements for a timely response.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.



CONFIDENTIAL BUSINESS INFORMATION

CERTIFICATION OF PROFESSIONAL GEOSCIENTIST:

Claimed as PBI

ACRONYMS AND ABBREVIATIONS

Note: All terms are written as used in the text.

Acronym, Abbreviation, or Term	Definition / Meaning
°C	degrees Celsius
°F	degrees Fahrenheit
µD	microdarcy
µg/m3	micrograms per meters cubed
µmhos/cm	micromhos per centimeter
µsips	micro square inches per pound
2D	two-dimensional
3D	three-dimensional
ACS	American Community Survey
AMPP	Association for Materials Protection and Performance
AMSL	above mean sea level
AoR	Area of Review
API	American Petroleum Institute
ASTM	American Society for Testing and Materials
AZMI	above-zone monitoring interval
BGL	measured depth below ground level
BHP	bottomhole pressure
BMSL	below mean sea level
BUQW	Base of Usable-Quality Water
CBG	Census Block Group
CBL	cement bond log
CCS	Carbon Capture and Storage
CEQ	U.S. Council on Environmental Quality
CFR	Code of Federal Regulations
CGM	Community Grievance Mechanism
CIL	casing inspection log
cm	centimeter
CO	carbon monoxide
CO2	carbon dioxide
COC	Chain-of-Custody
DHPT	downhole pressure temperature
DSA	double-studded adapter
DTS	distributed temperature sensing
EEHC	Exxon Equity Holding Company
EJ	environmental justice
EMC	Exxon Mobil Corporation
EOR	enhanced oil recovery

Acronym, Abbreviation, or Term	Definition / Meaning
EPA	U.S. Environmental Protection Agency
ERR	emergency or remedial response
ERRP	emergency and remedial response plan
ESD	Emergency Service Districts
ExxonMobil	ExxonMobil Low Carbon Solutions Onshore Storage LLC
°F/100 ft	Fahrenheit per 100 feet
ft	foot
GIS	Geographic Information System
GPa	gigapascal
GPRS	Ground Penetrating Radar Services, Inc.
GS	geologic sequestration
GSDT	Geologic Sequestration Data Tool
GWB	Geochemist's Workbench
HI	hazard index
HNBR	hydrogenated nitrile rubber
in	inch
Injection Unit	Fleming Sand and Upper Frio stratigraphic injection formations
Injection Interval	Specific injection zone that includes Flemming 1, 2, and 3 and the Upper Frio.
KB	Kelly Bushing
km	kilometer
LCZ	lower confining zone
LEDP	Local Economic Development Plan
m	**meter**
mD	millidarcy
mg	milligram
mg/L	milligram per liter
mi	mile(s)
MICP	mercury injection capillary pressure
MIT	mechanical integrity test
mm	millimeter
MMt	million metric tonne
MMta	million metric tonne per annum (year)
nD	nanodarcy
nm	nanometer
NMR	nuclear magnetic resonance
NTG	Net-to-Gross
OA	oxygen activation
OD	outer diameter

Acronym, Abbreviation, or Term	Definition / Meaning
P&A	plug and abandon
PISC	post-injection site care
PM2.5	particulate matter 2.5
ppb	parts per billion
ppf	pound per foot
ppg	pound per gallon
ppm	part per million
Project	Rose Carbon Capture and Storage Project
psi	pound per square inch
psia	pounds per square inch absolute
psi/ft	pound per square inch per foot
QASP	Quality Assurance Surveillance Plan
QC	quality control
RRC	Railroad Commission of Texas
SC	specific conductance
SF	safety factor
SGR	shale gouge ratio
SP	spontaneous potential
SRT	step rate test
TAC	Texas Administrative Code
TD	total depth
TDS	total dissolved solids
TR	[comment to define]
TVD	true vertical depth
TVDSS	true vertical depth subsea
TWDB	Texas Water Development Board
UCCZ	upper composite confining zone
UIC	underground injection control
Upper Confining Layer	Miocene-age UCCZ belonging to the Fleming Formation and includes the Amphistegina 'B'. Interchangeable with Top Seal or Upper Confining Unit or Upper Confining Zone
USDW	underground source of drinking water
USGS	U.S. Geological Survey
wt	weight
XRD	x-ray diffraction

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REQUIREMENTS MATRIX

The following requirements are for submittal of a Class VI Underground Injection Control application to the Railroad Commission of Texas. Additional submittals of the application to other regulatory agencies are indicated in this requirement matrix.

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.82	Required Class VI permit information		
146.91(e)	Regardless of whether a State has primary enforcement responsibility, owners or operators must submit all required reports, submittals, and notifications under subpart H of this part to EPA in an electronic format approved by EPA.	5.203(a)(1)(A) Form and filing. Each applicant for a permit to construct and operate a geologic storage facility must file an application with the division in Austin on a form prescribed by the Commission. The applicant must file the application and all attachments with the division and with EPA Region 6 in an electronic format approved by EPA. On the same date, the applicant must file one copy with each appropriate district office and one copy with the Executive Director of the Texas Commission on Environmental Quality. 5.207(b)(2) The operator must submit all required reports, submittals, and notifications under this subchapter to the director and to the EPA in an electronic format approved by the director and the Regional Administrator, respectively.	Class VI Application

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
Section 1 – Introduction			
146.82(a)(1)	Information required in 144.31(e)(1) through (6) of this chapter;	5.203(a)(2) General information. (A) On the application, the applicant must include the name, mailing address, and location of the facility for which the application is being submitted and the operator's name, address, telephone number, Commission Organization Report number, and ownership of the facility. (B) When a geologic storage facility is owned by one person but is operated by another person, it is the operator's duty to file an application for a permit. (C) The application must include a listing of all required permits or construction approvals for the facility received or applied for under federal or state environmental programs; (D) A person making an application to the director for a permit under this subchapter must submit a copy of the application to the Texas Commission on Environmental Quality (TCEQ) and must submit to the director a letter of determination from TCEQ concluding that drilling and operating an anthropogenic CO2 injection well for geologic storage or constructing or operating a geologic storage facility will not impact or interfere with any previous or existing Class I injection well, including any associated waste plume, or any other injection well authorized or permitted by TCEQ. The letter must be submitted to the director before any permit under this subchapter may be issued.	Section 1 – Introduction

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
144.31(e)(8)	A brief description of the nature of the business.		Section 1.0 – Project Introduction
144.31(e)(1)	The activities conducted by the applicant which require it to obtain permits under RCRA, UIC, the National Pollution Discharge Elimination system (NPDES) program under the Clean Water Act, or the Prevention of Significant Deterioration (PSD) program under the Clean Air Act.	5.203(a)(2)(C) General information. The application must include a listing of all required permits or construction approvals for the facility received or applied for under federal or state environmental programs;	Section 1.15 – Permits and Construction Approvals for Rose CCS Project
146.82(a)(7)(iii)	The source(s) of the carbon dioxide stream; and	5.203(i)(1)(C) the sources of the CO2 stream and the volume and/or mass of CO2 from each source; and	Section 1.0 – Project Introduction and 1.8 Well Operations
146.82(a)(7)(iv)	An analysis of the chemical and physical characteristics of the carbon dioxide stream.	5.203(i)(1)(D) an analysis of the chemical and physical characteristics of the CO2 stream prior to injection.	1.8 Well Operations
144.31(e)(2)	Name, mailing address, and location of the facility for which the application is submitted.	5.203(a)(2)(A) General information. On the application, the applicant must include the name, mailing address, and location of the facility for which the application is being submitted and the operator's name, address, telephone number, Commission Organization Report number, and ownership of the facility.	Section 1.2 – Contact Information
144.31(e)(3)	Up to four SIC codes which best reflect the principal products or services provided by the facility.	Not Addressed.	Section 1.2 – Contact Information

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
144.31(e)(4)	The operator's name, address, telephone number, ownership status, and status as Federal, State, private, public, or other entity.	5.203(a)(2)(A) General information. On the application, the applicant must include the name, mailing address, and location of the facility for which the application is being submitted and the operator's name, address, telephone number, Commission Organization Report number, and ownership of the facility.	Section 1.2 – Contact Information
144.31(e)(5)	Whether the facility is located on Indian lands.	Refer to 5.203(a)(2)(E)and(F). 5.203(a)(2)(E) The application must indicate whether the geologic storage project is located on Indian lands. (F) The application must include a list of contacts for those States, Tribes, and Territories any portion of which is identified to be within the AOR of the geologic storage project based on the map showing the injection well and the AOR	Section 1.2 – Contact Information
144.31(e)(1)	The activities conducted by the applicant which require it to obtain permits under RCRA, UIC, the National Pollution Discharge Elimination system (NPDES) program under the Clean Water Act, or the Prevention of Significant Deterioration (PSD) program under the Clean Air Act.	5.203(a)(2)(C) General information. The application must include a listing of all required permits or construction approvals for the facility received or applied for under federal or state environmental programs;	Section 1.15 – Permits and Construction Approvals for Rose CCS Project
144.31(e)(6)	A listing of all permits or construction approvals received or applied for under any of the following programs:	5.203(a)(2)(C) General information. The application must include a listing of all required permits or construction approvals for the facility received or applied for under federal or state environmental programs;	Section 1.15 – Permits and Construction Approvals for Rose CCS Project
144.31(e)(6)(i)	Hazardous Waste Management program under RCRA.		Section 1.15 – Permits and Construction Approvals for Rose CCS Project

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
144.31(e)(6)(ii)	UIC program under SDWA.		Section 1.15 – Permits and Construction Approvals for Rose CCS Project
144.31(e)(6)(iii)	NPDES program under CWA.		Section 1.15 – Permits and Construction Approvals for Rose CCS Project
144.31(e)(6)(iv)	Prevention of Significant Deterioration (PSD) program under the Clean Air Act.		Section 1.15 – Permits and Construction Approvals for Rose CCS Project
144.31(e)(6)(v)	Nonattainment program under the Clean Air Act.		Section 1.15 – Permits and Construction Approvals for Rose CCS Project
144.31(e)(6)(vi)	National Emission Standards for Hazardous Pollutants (NESHAPS) preconstruction approval under the Clean Air Act.		Section 1.15 – Permits and Construction Approvals for Rose CCS Project
144.31(e)(6)(vii)	Ocean dumping permits under the Marine Protection Research and Sanctuaries Act.		Section 1.15 – Permits and Construction Approvals for Rose CCS Project
144.31(e)(6)(viii)	Dredge and fill permits under section 404 of CWA.		Section 1.15 – Permits and Construction Approvals for Rose CCS Project
144.31(e)(6)(ix)	Other relevant environmental permits, including State permits.		Section 1.15 – Permits and Construction Approvals for Rose CCS Project

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
Section 2 – Site Characterization			
146.82(a)(3)	Information on the geologic structure and hydrogeologic properties of the proposed storage site and overlying formations, including:	5.203(c) Geologic, geochemical, and hydrologic information. (1) The applicant must submit a descriptive report prepared by a knowledgeable person that includes an interpretation of the results of appropriate logs, surveys, sampling, and testing sufficient to determine the depth, thickness, porosity, permeability, and lithology of, and the geochemistry of any formation fluids in, all relevant geologic formations. (2) The applicant must submit information on the geologic structure and reservoir properties of the proposed storage reservoir and overlying formations, including the following information:	Section 2.5 – Site Geology Section 2.9 – Assessment of Injection Interval and Confining Zone Geochemical Reactions Section 2.10 – Hydrogeology
146.82(a)(3)(ii)	The location, orientation, and properties of known or suspected faults and fractures that may transect the confining zone(s) in the area of review and a determination that they would not interfere with containment;	5.203(c)(2)(C) the location, orientation, and properties of known or suspected transmissive faults or fractures that may transect the confining zone within the AOR and a determination that such faults or fractures would not compromise containment;	Section 2.5.9 – Seismic Data
146.82(a)(3)(iii)	Data on the depth, areal extent, thickness, mineralogy, porosity, permeability, and	5.203(c)(2)(B) the depth, areal extent, thickness, mineralogy, porosity, permeability,	Section 2.3 – Major Stratigraphic Units:

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	capillary pressure of the injection and confining zone(s); including geology/facies changes based on field data which may include geologic cores, outcrop data, seismic surveys, well logs, and names and lithologic descriptions;	and capillary pressure of, and the geochemistry of any formation fluids in, the storage reservoir and confining zone and any other relevant geologic formations, including geology/facies changes based on field data, which may include geologic cores, outcrop data, seismic surveys, well logs, and lithologic descriptions, and the analyses of logging, sampling, and testing results used to make such determinations;	Confining and Injection Zones; Section 2.9 – Assessment of Injection Interval and Confining Zone Geochemical Reactions
146.82(a)(3)(iv)	Geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within the confining zone(s);	5.203(c)(2)(E) geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within the confining zone;	Section 2.6 – Geomechanics and Petrophysics
146.82(a)(3)(v)	Information on the seismic history including the presence and depth of seismic sources and a determination that the seismicity would not interfere with containment; and	5.203(c)(2)(D) the seismic history, including the presence and depth of seismic sources, and a determination that the seismicity would not compromise containment;	Section 2.11 – Seismic Risk and Fault-Slip Potential for AoR
146.82(a)(3)(vi)	Geologic and topographic maps and cross sections illustrating regional geology, hydrogeology, and the geologic structure of the local area.	5.203(c)(2)(A) geologic and topographic maps and cross sections illustrating regional geology, hydrogeology, and the geologic structure of the area from the ground surface to the base of the injection zone within the AOR that indicate the general vertical and lateral limits of all USDWs within the AOR, their positions relative to the storage reservoir and the direction of water movement, where known;	Appendix B

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.82(a)(5)	Maps and stratigraphic cross sections indicating the general vertical and lateral limits of all USDWs, water wells and springs within the area of review, their positions relative to the injection zone(s), and the direction of water movement, where known;	5.203(c)(2)(A) geologic and topographic maps and cross sections illustrating regional geology, hydrogeology, and the geologic structure of the area from the ground surface to the base of the injection zone within the AOR that indicate the general vertical and lateral limits of all USDWs within the AOR, their positions relative to the storage reservoir and the direction of water movement, where known;	Appendix B
146.82(a)(6)	Baseline geochemical data on subsurface formations, including all USDWs in the area of review;	5.203(c)(2)(G) baseline geochemical data for subsurface formations that will be used for monitoring purposes, including all formations containing USDWs within the AOR.	Section 2.9 – Assessment of Injection Interval and Confining Zone Geochemical Reactions
146.83(a)	Owners or operators of Class VI wells must demonstrate to the satisfaction of the Director that the wells will be sited in areas with a suitable geologic system. The owners or operators must demonstrate that the geologic system comprises:	5.206 (b) General criteria. The director may issue a permit under this subchapter if the applicant demonstrates and the director finds that: (6) the geologic storage facility will be sited in an area with suitable geology, which at a minimum must include: (A) an injection zone of sufficient areal extent, thickness, porosity, and permeability to receive the total anticipated volume of the CO2 stream	Section 2.5.6. Geologic Characteristics of the Injection Zone; Section 2.12 Site Suitability
146.83(a)(1)	An injection zone(s) of sufficient areal extent, thickness, porosity, and permeability to receive the total anticipated volume of the carbon dioxide stream;	5.206 (b) (6)(A) General criteria. The director may issue a permit under this subchapter if the applicant demonstrates and the director finds that: (6) the geologic storage facility will be sited in an area with suitable geology, which at a minimum must include: (A) an injection zone of sufficient areal extent, thickness, porosity,	Section 2.5.6. Geologic Characteristics of the Injection Zone; Section 2.12 Site Suitability

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		and permeability to receive the total anticipated volume of the CO2 stream;	
146.83(a)(2)	Confining zone(s) free of transmissive faults or fractures and of sufficient areal extent and integrity to contain the injected carbon dioxide stream and displaced formation fluids and allow injection at proposed maximum pressures and volumes without initiating or propagating fractures in the confining zone(s).	5.206 (b) (6)(B) a confining zone that is laterally continuous and free of known transecting transmissive faults or fractures over an area sufficient to contain the injected CO2 stream and displaced formation fluids and allow injection at proposed maximum pressures and volumes without compromising the confining zone or causing the movement of fluids that endangers USDWs	Section 2.3 – Major Stratigraphic Units: Confining and Injection Zones; Section 2.9 – Assessment of Injection Interval and Confining Zone Geochemical Reactions; Section 2.5.5 – Top and Bottom Elevations of Injection and Confining Zones
146.83(b)	The Director may require owners or operators of Class VI wells to identify and characterize additional zones that will impede vertical fluid movement, are free of faults and fractures that may interfere with containment, allow for pressure dissipation, and provide additional opportunities for monitoring, mitigation, and remediation.		Not Applicable
146.84(c)	Owners or operators of Class VI wells must perform the following actions to delineate the area of review and identify all wells that require corrective action:	5.203(d) (1) Initial delineation of the AOR and initial corrective action. The applicant must delineate the AOR, identify all wells that require corrective action, and perform corrective action on those wells. Corrective action may be phased.	Section 3.9 Corrective Action Plan and Schedule

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.84(c)(1)	Predict, using existing site characterization, monitoring and operational data, and computational modeling, the projected lateral and vertical migration of the carbon dioxide plume and formation fluids in the subsurface from the commencement of injection activities until the plume movement ceases, until pressure differentials sufficient to cause the movement of injected fluids or formation fluids into a USDW are no longer present, or until the end of a fixed time period as determined by the Director. The model must:	5.203(d)(1)(A) (i) Delineation of AOR. (i) Using computational modeling that considers the volumes and/or mass and the physical and chemical properties of the injected CO2 stream, the physical properties of the formation into which the CO2 stream is to be injected, and available data including data available from logging, testing, or operation of wells, the applicant must predict the lateral and vertical extent of migration for the CO2 plume and formation fluids and the pressure differentials required to cause movement of injected fluids or formation fluids into a USDW in the subsurface for the following time periods: (I) five years after initiation of injection; (II) from initiation of injection to the end of the injection period proposed by the applicant; and (III) from initiation of injection until the movement of the CO2 plume and associated pressure front stabilizes.	Section 2.8.1 Geologic Model of the AoR Appendix B
146.84(c)(1)(i)	Be based on detailed geologic data collected to characterize the injection zone(s), confining zone(s) and any additional zones; and anticipated operating data, including injection pressures, rates, and total volumes over the proposed life of the geologic sequestration project;	5.203(d)(1)(A) (ii) (I) and (II) (ii) The applicant must use a computational model that: (I) is based on geologic and reservoir engineering information collected to characterize the injection zone and the confining zone; (II) is based on anticipated operating data, including injection pressures, rates, temperatures, and total volumes and/or mass over the proposed duration of injection;	Section 2.1 – Reservoir Characterization and 3D Geologic Modeling

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.84(c)(1)(ii)	Take into account any geologic heterogeneities, other discontinuities, data quality, and their possible impact on model predictions; and	5.203(d)(1)(A) (ii) (III) (ii) The applicant must use a computational model that: (III) takes into account relevant geologic heterogeneities and data quality, and their possible impact on model predictions;	3.6 Model Design and Input Parameters
146.86(b)(1)(vii)	Lithology of injection and confining zone(s);	5.203(e)(2)(H) lithology of injection and confining zones;	Section 2.3 – Major Stratigraphic Units: Confining and Injection Zones Section 2.5 – Site Geology
146.93(c)(1)(vii)	A characterization of the confining zone(s) including a demonstration that it is free of transmissive faults, fractures, and micro-fractures and of appropriate thickness, permeability, and integrity to impede fluid (e.g., carbon dioxide, formation fluids) movement;	5.203(m)(7)(G) a characterization of the confining zone(s) including a demonstration that it is free of transmissive faults, fractures, and micro-fractures and of appropriate thickness, permeability, and integrity to impede fluid (e.g., CO2, formation fluids) movement;	Section 2.3 – Major Stratigraphic Units: Confining and Injection Zones Appendix B
146.93(c)(1)(x)	The distance between the injection zone and the nearest USDWs above and/or below the injection zone; and	5.203(m)(7)(J) the distance between the injection zone and the nearest USDWs above and/or below the injection zone; and	Section 2.10 – Hydrogeology

Section 3 – AoR and Corrective Action			
146.84(a)	The area of review is the region surrounding the geologic sequestration project where USDWs may be endangered by the injection activity. The area of review is delineated using computational modeling that accounts for the physical and chemical properties of all phases of the injected carbon dioxide stream and is based on available site	5.102(5) Area of review (AOR)--The subsurface three dimensional extent of the CO2 stream plume and the associated pressure front, as well as the overlying formations, any underground sources of drinking water overlying an injection zone along with any intervening formations, and	Sections 3.3, 3.4, 3.5, 3.6, and 3.7

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	characterization, monitoring, and operational data.	the surface area above that delineated region.	
146.84(c)	Owners or operators of Class VI wells must perform the following actions to delineate the area of review and identify all wells that require corrective action:	5.203(d) (1) Initial delineation of the AOR and initial corrective action. The applicant must delineate the AOR, identify all wells that require corrective action, and perform corrective action on those wells. Corrective action may be phased.	Section 3.7 – AoR Delineation Based on Model Results Section 3.9 – Corrective Action Plan and Schedule
146.84(c)(1)	Predict, using existing site characterization, monitoring and operational data, and computational modeling, the projected lateral and vertical migration of the carbon dioxide plume and formation fluids in the subsurface from the commencement of injection activities until the plume movement ceases, until pressure differentials sufficient to cause the movement of injected fluids or formation fluids into a USDW are no longer present, or until the end of a fixed time period as determined by the Director. The model must:	5.203(d)(1)(A) (i) Delineation of AOR. (i) Using computational modeling that considers the volumes and/or mass and the physical and chemical properties of the injected CO2 stream, the physical properties of the formation into which the CO2 stream is to be injected, and available data including data available from logging, testing, or operation of wells, the applicant must predict the lateral and vertical extent of migration for the CO2 plume and formation fluids and the pressure differentials required to cause movement of injected fluids or formation fluids into a USDW in the subsurface for the following time periods: (I) five years after initiation of injection; (II) from initiation of injection to the end of the injection period proposed by the applicant; and (III) from initiation of injection until the movement of the CO2 plume and associated pressure front stabilizes.	Section 3.7 – AoR Delineation Based on Model Results Section 3.10 – AoR Reevaluation Plan and Schedule

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.84(c)(1)(i)	Be based on detailed geologic data collected to characterize the injection zone(s), confining zone(s) and any additional zones; and anticipated operating data, including injection pressures, rates, and total volumes over the proposed life of the geologic sequestration project;	5.203(d)(1)(A) (ii) (I) and (II) (ii) The applicant must use a computational model that: (I) is based on geologic and reservoir engineering information collected to characterize the injection zone and the confining zone; (II) is based on anticipated operating data, including injection pressures, rates, temperatures, and total volumes and/or mass over the proposed duration of injection;	Sections 3.3, 3.4, 3.5, 3.6, and 3.7
146.84(c)(1)(ii)	Take into account any geologic heterogeneities, other discontinuities, data quality, and their possible impact on model predictions; and	5.203(d)(1)(A) (ii) (III) (ii) The applicant must use a computational model that: (III) takes into account relevant geologic heterogeneities and data quality, and their possible impact on model predictions;	Section 3.8 – Model Calibration and Validation
146.93(c)(1)(iii)	The predicted rate of carbon dioxide plume migration within the injection zone, and the predicted timeframe for the cessation of migration;	5.203(m)(7)(C) the predicted rate of CO2 plume migration within the injection zone, and the predicted timeframe for the stabilization of the CO2 plume and associated pressure front;	Section 3.7 – AoR Delineation Based on Model Results
146.93(c)(1)(iv)	A description of the site-specific processes that will result in carbon dioxide trapping including immobilization by capillary trapping, dissolution, and mineralization at the site;	5.203(m)(7)(D) a description of the site-specific processes that will result in CO2 trapping including immobilization by capillary trapping, dissolution, and mineralization at the site;	Section 3.6 – Model Design and Input Parameters
146.93(c)(1)(v)	The predicted rate of carbon dioxide trapping in the immobile capillary phase, dissolved phase, and/or mineral phase;	5.203(m)(7)(E) the predicted rate of CO2 trapping in the immobile capillary phase, dissolved phase, and/or mineral phase;	Section 3.6 – Model Design and Input Parameters
146.82(a)(7)(ii)	Average and maximum injection pressure;	5.203(i)(1)(B) the average and maximum surface injection pressure;	Section 3.6.3 – Fluid Injection Rates

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.82(a)(1)	Information required in 144.31(e)(1) through (6) of this chapter;	5.203(a)(2) General information. (A) On the application, the applicant must include the name, mailing address, and location of the facility for which the application is being submitted and the operator's name, address, telephone number, Commission Organization Report number, and ownership of the facility. (B) When a geologic storage facility is owned by one person but is operated by another person, it is the operator's duty to file an application for a permit. (C) The application must include a listing of all required permits or construction approvals for the facility received or applied for under federal or state environmental programs; (D) A person making an application to the director for a permit under this subchapter must submit a copy of the application to the Texas Commission on Environmental Quality (TCEQ) and must submit to the director a letter of determination from TCEQ concluding that drilling and operating an anthropogenic CO2 injection well for geologic storage or constructing or operating a geologic storage facility will not impact or interfere with any previous or existing Class I injection well, including any associated waste plume, or any other injection well authorized or permitted by TCEQ. The letter must be submitted to the director before any permit under this subchapter may be issued. (E) The application must indicate whether the geologic storage project is located on Indian lands. (F) The	Section 1 – Introduction

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		application must include a list of contacts for those States, Tribes, and Territories any portion of which is identified to be within the AOR of the geologic storage project based on the map showing the injection well and the AOR.	
146.82(a)(2)	A map showing the injection well for which a permit is sought and the applicable area of review consistent with 146.84. Within the area of review, the map must show the number or name, and location of all injection wells, producing wells, abandoned wells, plugged wells or dry holes, deep stratigraphic boreholes, State- or EPA-approved subsurface cleanup sites, surface bodies of water, springs, mines (surface and subsurface), quarries, water wells, other pertinent surface features including structures intended for human occupancy, State, Tribal, and Territory boundaries, and roads. The map should also show faults, if known or suspected. Only information of public record is required to be included on this map;	5.203 (b) Surface map and information. Only information of public record is required to be included on this map. (1) The applicant must file with the director a surface map delineating the proposed location and geographic coordinates of any injection wells, any proposed monitoring wells, and the boundary of the geologic storage facility for which a permit is sought and the applicable AOR. The applicant must indicate the coordinate system used. (2) The applicant must show within the AOR on the map the number or name and the location of: (A) all known artificial penetrations through the confining zone, including stratigraphic boreholes, injection wells, producing wells, inactive wells, plugged wells, or dry holes; (B) the locations of cathodic protection holes, subsurface cleanup sites, bodies of surface water, springs, surface and subsurface mines, quarries, and water wells; and (C) other pertinent surface features, including pipelines, roads, and structures intended for human occupancy. (3) The applicant must identify on the map any known or suspected faults expressed at the surface.	Appendix B – Site Characterization Files

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.82(a)(3)(i)	Maps and cross sections of the area of review;	5.203(c)(2)(A) geologic and topographic maps and cross sections illustrating regional geology, hydrogeology, and the geologic structure of the area from the ground surface to the base of the injection zone within the AOR that indicate the general vertical and lateral limits of all USDWs within the AOR, their positions relative to the storage reservoir and the direction of water movement, where known;	Appendix B – Site Characterization Files
146.82(a)(4)	A tabulation of all wells within the area of review which penetrate the injection or confining zone(s). Such data must include a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Director may require;	5.203(d)(1)(B) Identification and table of penetrations. The applicant must identify, compile, and submit a table listing all penetrations, including active, inactive, plugged, and unplugged wells and underground mines in the AOR that may penetrate the confining zone, that are known or reasonably discoverable through specialized knowledge or experience. The applicant must provide a description of each penetration's type, construction, date drilled or excavated, location, depth, and record of plugging and/or completion or closure. Examples of specialized knowledge or experience may include reviews of federal, state, and local government records, interviews with past and present owners, operators, and occupants, reviews of historical information (including aerial photographs, chain of title documents, and land use records), and visual inspections of the facility and adjoining properties	Section 3.9 – Corrective Action Plan and Schedule

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.82(a)(13)	Proposed area of review and corrective action plan that meets the requirements under 146.84;	5.203(d)(2) AOR and corrective action plan. As part of an application, the applicant must submit an AOR and corrective action plan that includes the following information: (A) the method for delineating the AOR, including the model to be used, assumptions that will be made, and the site characterization data on which the model will be based; (B) for the AOR, a description of: (i) the minimum fixed frequency, not to exceed five years, at which the applicant proposes to reevaluate the AOR during the life of the geologic storage facility; (ii) how monitoring and operational data will be used to re-evaluate the AOR; and (iii) the monitoring and operational conditions that would warrant a re-evaluation of the AOR prior to the next scheduled re-evaluation; and (C) a corrective action plan that describes: (i) how the corrective action will be conducted; (ii) how corrective action will be adjusted if there are changes in the AOR; (iii) if a phased corrective action is planned, how the phasing will be determined; and (iv) how site access will be secured for future corrective action.	Section 3.9 – Corrective Action Plan and Schedule
146.82(a)(20)	A list of contacts, submitted to the Director, for those States, Tribes, and Territories identified to be within the area of review of the Class VI project based on information provided in paragraph (a)(2) of this section; and		Section 1 – Introduction

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.84(a)	The area of review is the region surrounding the geologic sequestration project where USDWs may be endangered by the injection activity. The area of review is delineated using computational modeling that accounts for the physical and chemical properties of all phases of the injected carbon dioxide stream and is based on available site characterization, monitoring, and operational data.	5.102(5) Area of review (AOR)--The subsurface three dimensional extent of the CO2 stream plume and the associated pressure front, as well as the overlying formations, any underground sources of drinking water overlying an injection zone along with any intervening formations, and the surface area above that delineated region.	Sections 3.3, 3.4, 3.5, 3.6, and 3.7
146.84(b)	The owner or operator of a Class VI well must prepare, maintain, and comply with a plan to delineate the area of review for a proposed geologic sequestration project, periodically reevaluate the delineation, and perform corrective action that meets the requirements of this section and is acceptable to the Director. The requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit. As a part of the permit application for approval by the Director, the owner or operator must submit an area of review and corrective action plan that includes the following information:	5.203(d) AOR and corrective action. This subsection describes the standards for the information regarding the delineation of the AOR, the identification of penetrations, and corrective action that an applicant must include in an application. (1) Initial delineation of the AOR and initial corrective action. The applicant must delineate the AOR, identify all wells that require corrective action, and perform corrective action on those wells. Corrective action may be phased. (A) Delineation of AOR. (i) Using computational modeling that considers the volumes and/or mass and the physical and chemical properties of the injected CO2 stream, the physical properties of the formation into which the CO2 stream is to be injected, and available data including data available from logging, testing, or operation of wells, the applicant must predict the lateral and vertical extent of migration for the CO2 plume and formation fluids and the	Sections 3.3, 3.4, 3.5, 3.6, 3.7, and 3.9

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		pressure differentials required to cause movement of injected fluids or formation fluids into a USDW in the subsurface for the following time periods: (I) five years after initiation of injection; (II) from initiation of injection to the end of the injection period proposed by the applicant; and (III) from initiation of injection until the movement of the CO2 plume and associated pressure front stabilizes. (ii) The applicant must use a computational model that: (I) is based on geologic and reservoir engineering information collected to characterize the injection zone and the confining zone; (II) is based on anticipated operating data, including injection pressures, rates, temperatures, and total volumes and/or mass over the proposed duration of injection; (III) takes into account relevant geologic heterogeneities and data quality, and their possible impact on model predictions; (IV) considers the physical and chemical properties of injected and formation fluids; and (V) considers potential migration through known faults, fractures, and artificial penetrations and beyond lateral spill points. (iii) The applicant must provide the name and a description of the model, software, the assumptions used to determine the AOR, and the equations solved.	

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.84(b)(1)	The method for delineating the area of review that meets the requirements of paragraph (c) of this section, including the model to be used, assumptions that will be made, and the site characterization data on which the model will be based;	5.203(d)(2) (A) AOR and corrective action plan. As part of an application, the applicant must submit an AOR and corrective action plan that includes the following information: (A) the method for delineating the AOR, including the model to be used, assumptions that will be made, and the site characterization data on which the model will be based;	Sections 3.3, 3.4, 3.5, 3.6, and 3.7
146.84(b)(2)	A description of:	5.203(d)(2)(B) for the AOR, a description of:	See Below
146.84(b)(2)(i)	The minimum fixed frequency, not to exceed five years, at which the owner or operator proposes to reevaluate the area of review;	5.203(d)(2)(B)(i) the minimum fixed frequency, not to exceed five years, at which the applicant proposes to reevaluate the AOR during the life of the geologic storage facility;	Section 3.10 – AoR Reevaluation Plan and Schedule
146.84(b)(2)(ii)	The monitoring and operational conditions that would warrant a reevaluation of the area of review prior to the next scheduled reevaluation as determined by the minimum fixed frequency established in paragraph (b)(2)(i) of this section.	5.203(d)(2)(B)(iii) the monitoring and operational conditions that would warrant a re-evaluation of the AOR prior to the next scheduled re-evaluation; and	Section 3.10 – AoR Reevaluation Plan and Schedule
146.84(b)(2)(iii)	How monitoring and operational data (e.g., injection rate and pressure) will be used to inform an area of review reevaluation; and	5.203(d)(2)(B)(ii) how monitoring and operational data will be used to re-evaluate the AOR;	Section 3.10 – AoR Reevaluation Plan and Schedule
146.84(b)(2)(iv)	How corrective action will be conducted to meet the requirements of paragraph (d) of this section, including what corrective action will be performed prior to injection and what, if any, portions of the area of review will have corrective action addressed on a phased basis and how the phasing will be determined; how corrective action will be adjusted if there are	5.203(d)(2)(C) a corrective action plan that describes: (i) how the corrective action will be conducted; (ii) how corrective action will be adjusted if there are changes in the AOR; (iii) if a phased corrective action is planned, how the phasing will be determined; and	Section 3.9 – Corrective Action Plan and Schedule Section 3.10 – AoR Reevaluation Plan and Schedule

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	changes in the area of review; and how site access will be guaranteed for future corrective action.	(iv) how site access will be secured for future corrective action.	
146.84(c)	Owners or operators of Class VI wells must perform the following actions to delineate the area of review and identify all wells that require corrective action:	5.203(d)(1) Initial delineation of the AOR and initial corrective action. The applicant must delineate the AOR, identify all wells that require corrective action, and perform corrective action on those wells. Corrective action may be phased.	See Below
146.84(c)(1)	Predict, using existing site characterization, monitoring and operational data, and computational modeling, the projected lateral and vertical migration of the carbon dioxide plume and formation fluids in the subsurface from the commencement of injection activities until the plume movement ceases, until pressure differentials sufficient to cause the movement of injected fluids or formation fluids into a USDW are no longer present, or until the end of a fixed time period as determined by the Director. The model must:	5.203(d)(1)(A) (i) Delineation of AOR. (i) Using computational modeling that considers the volumes and/or mass and the physical and chemical properties of the injected CO2 stream, the physical properties of the formation into which the CO2 stream is to be injected, and available data including data available from logging, testing, or operation of wells, the applicant must predict the lateral and vertical extent of migration for the CO2 plume and formation fluids and the pressure differentials required to cause movement of injected fluids or formation fluids into a USDW in the subsurface for the following time periods: (I) five years after initiation of injection; (II) from initiation of injection to the end of the injection period proposed by the applicant; and (III) from initiation of injection until the movement of the CO2 plume and associated pressure front stabilizes.	Section 3.7 – AoR Delineation Based on Model Results Appendix B

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.84(c)(1)(i)	Be based on detailed geologic data collected to characterize the injection zone(s), confining zone(s) and any additional zones; and anticipated operating data, including injection pressures, rates, and total volumes over the proposed life of the geologic sequestration project;	5.203(d)(1)(A) (ii) (I) and (II) (ii) The applicant must use a computational model that: (I) is based on geologic and reservoir engineering information collected to characterize the injection zone and the confining zone; (II) is based on anticipated operating data, including injection pressures, rates, temperatures, and total volumes and/or mass over the proposed duration of injection;	Sections 3.3, 3.4, 3.5, 3.6, and 3.7
146.84(c)(1)(ii)	Take into account any geologic heterogeneities, other discontinuities, data quality, and their possible impact on model predictions; and	5.203(d)(1)(A) (ii) (III) (ii) The applicant must use a computational model that: (III) takes into account relevant geologic heterogeneities and data quality, and their possible impact on model predictions;	3.6 Model Design and Input Parameters
146.84(c)(1)(iii)	Consider potential migration through faults, fractures, and artificial penetrations	5.203(d)(1)(A) (ii) (V) (V) considers potential migration through known faults, fractures, and artificial penetrations and beyond lateral spill points.	Section 3.6.4 – Fracture Pressure and Fracture Gradient Section 3.9 – Corrective Action Plan and Schedule
146.84(c)(2)	Using methods approved by the Director, identify all penetrations, including active and abandoned wells and underground mines, in the area of review that may penetrate the confining zone(s). Provide a description of each well's type, construction, date drilled, location, depth, record of plugging and/or completion, and any additional information the Director may require; and	5.203(d)(1)(B) Identification and table of penetrations. The applicant must identify, compile, and submit a table listing all penetrations, including active, inactive, plugged, and unplugged wells and underground mines in the AOR that may penetrate the confining zone, that are known or reasonably discoverable through specialized knowledge or experience. The applicant must provide a description of each	Section 3.9 – Corrective Action Plan and Schedule

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		penetration's type, construction, date drilled or excavated, location, depth, and record of plugging and/or completion or closure. Examples of specialized knowledge or experience may include reviews of federal, state, and local government records, interviews with past and present owners, operators, and occupants, reviews of historical information (including aerial photographs, chain of title documents, and land use records), and visual inspections of the facility and adjoining properties.	
146.84(c)(3)	Determine which abandoned wells in the area of review have been plugged in a manner that prevents the movement of carbon dioxide or other fluids that may endanger USDWs, including use of materials compatible with the carbon dioxide stream.	5.203(d)(1)(C) Corrective action. The applicant must demonstrate whether each of the wells on the table of penetrations has or has not been plugged and whether each of the underground mines (if any) on the table of penetrations has or has not been closed in a manner that prevents the movement of injected fluids or displaced formation fluids that may endanger USDWs or allow the injected fluids or formation fluids to escape the permitted injection zone. The demonstration shall include evidence that the materials used are compatible with the carbon dioxide stream. The applicant must perform corrective action on all wells and underground mines in the AOR that are determined to need corrective action. The operator must perform corrective action using materials suitable for use with the CO2 stream. Corrective action may be phased	Section 3.9 – Corrective Action Plan and Schedule

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.84(d)	Owners or operators of Class VI wells must perform corrective action on all wells in the area of review that are determined to need corrective action, using methods designed to prevent the movement of fluid into or between USDWs, including use of materials compatible with the carbon dioxide stream, where appropriate.	5.203(d)(1)(C) Corrective action. The applicant must demonstrate whether each of the wells on the table of penetrations has or has not been plugged and whether each of the underground mines (if any) on the table of penetrations has or has not been closed in a manner that prevents the movement of injected fluids or displaced formation fluids that may endanger USDWs or allow the injected fluids or formation fluids to escape the permitted injection zone. The demonstration shall include evidence that the materials used are compatible with the carbon dioxide stream. The applicant must perform corrective action on all wells and underground mines in the AOR that are determined to need corrective action. The operator must perform corrective action using materials suitable for use with the CO2 stream. Corrective action may be phased	Section 3.9 – Corrective Action Plan and Schedule
146.84(e)	At the minimum fixed frequency, not to exceed five years, as specified in the area of review and corrective action plan, or when monitoring and operational conditions warrant, owners or operators must:	5.206(g) Permit conditions for AOR and corrective action. At the frequency specified in the approved AOR and corrective action plan or permit, and whenever warranted by a material change in the monitoring and/or operational data or in the evaluation of the monitoring and operational data by the operator, but no less frequently than every five years, the operator of a geologic storage facility also must:	See Below
146.84(e)(1)	Reevaluate the area of review in the same manner specified in paragraph (c)(1) of this section;	5.206(g) (1) perform a re-evaluation of the AOR by performing all of the actions specified in 5.203(d)(1)(A) – (C) of this title to delineate	3.10 – AoR Reevaluation Plan and Schedule

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		the AOR and identify all wells that require corrective action;	
146.84(e)(2)	Identify all wells in the reevaluated area of review that require corrective action in the same manner specified in paragraph (c) of this section;	5.206(g) (2) identify all wells in the re-evaluated AOR that require corrective action;	3.10 – AoR Reevaluation Plan and Schedule
146.84(e)(3)	Perform corrective action on wells requiring corrective action in the reevaluated area of review in the same manner specified in paragraph (d) of this section; and	5.206(g)(3) perform corrective action on wells requiring corrective action in the re-evaluated AOR in the same manner specified in 5.203(d)(1)(C) of this title;	3.10 – AoR Reevaluation Plan and Schedule
146.84(e)(4)	Submit an amended area of review and corrective action plan or demonstrate to the Director through monitoring data and modeling results that no amendment to the area of review and corrective action plan is needed. Any amendments to the area of review and corrective action plan must be approved by the Director, must be incorporated into the permit, and are subject to the permit modification requirements at 144.39 or 144.41 of this chapter, as appropriate.	5.206(g)(4) submit an amended AOR and corrective action plan or demonstrate to the director through monitoring data and modeling results that no change to the AOR and corrective action plan is needed. Any amendments to the AOR and corrective action plan must be approved by the director, must be incorporated into the permit, and are subject to the permit modification requirements at 5.202 of this title (relating to Permit Required, and Draft Permit and Fact Sheet), as applicable; and	3.10 – AoR Reevaluation Plan and Schedule
146.84(g)	All modeling inputs and data used to support area of review reevaluations under paragraph (e) of this section shall be retained for 10 years.	5.207 (e) (5) Record retention. The operator must retain all documentation of good faith claim to necessary and sufficient property rights to operate the geologic storage facility until the director issues the final certificate of closure in accordance with 5.206(k)(7) of this title.	3.10 – AoR Reevaluation Plan and Schedule

Section 4 – Engineering Design and Operations

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.82(c)(5)	Final injection well construction procedures that meet the requirements of 146.86;	5.206(c) Permit conditions for injection well construction. (1) Construction of anthropogenic CO2 injection wells must meet the criteria in 5.203(e) of this title. (2) Within 30 days after the completion or conversion of an injection well subject to this subchapter, the operator must file with the division a complete record of the well on Commission Form W-2, Oil Well Potential Test, Completion or Recompletion Report and Log showing the current completion. (3) Except in the case of an emergency repair, the operator of a geologic storage facility must notify the director in writing at least 30 days prior to conducting any well workover that involves running tubing and setting packers, beginning any workover or remedial operation, or conducting any required pressure tests or surveys. Such activities shall not commence before the end of the 30 days unless authorized by the director. In the case of an emergency repair, the operator must notify the director of such emergency repair as soon as reasonably practical	Section 4.0 – Well Construction Plan and Operating Conditions
146.86	Injection well construction requirements.	5.203(e)Injection well construction.	Section 4.0 – Well Construction Plan and Operating Conditions
146.86(a)	General. The owner or operator must ensure that all Class VI wells are constructed and completed to:	5.203(e)(1)(A) General. The operator of a geologic storage facility must ensure that all anthropogenic CO2 injection wells are constructed and completed in a manner that will:	See Below

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.86(a)(1)	Prevent the movement of fluids into or between USDWs or into any unauthorized zones;	5.203(e)(1)(A)(i) prevent the movement of injected CO2 or displaced formation fluids into any unauthorized zones or into any areas where they could endanger USDWs;	Section 4.1 – Objectives, Section 4.2 – Engineering Design
146.86(a)(2)	Permit the use of appropriate testing devices and workover tools; and	5.203(e)(1)(A)(ii) allow the use of appropriate testing devices and workover tools; and	Section 4.1 – Objectives, Section 4.2 – Engineering Design
146.86(a)(3)	Permit continuous monitoring of the annulus space between the injection tubing and long string casing.	5.203(e)(1)(A)(iii)allow continuous monitoring of the annulus space between the injection tubing and long string casing	Section 4.1 – Objectives, Section 4.2 – Engineering Design
146.86(b)	Casing and cementing of Class VI wells.	5.203(e)(1)(B) Casing and cementing of anthropogenic CO2 injection wells.	See Below

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.86(b)(1)	Casing and cement or other materials used in the construction of each Class VI well must have sufficient structural strength and be designed for the life of the geologic sequestration project. All well materials must be compatible with fluids with which the materials may be expected to come into contact and must meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the Director. The casing and cementing program must be designed to prevent the movement of fluids into or between USDWs. In order to allow the Director to determine and specify casing and cementing requirements, the owner or operator must provide the following information:	5.203(e)(1)(B)(i) The operator must ensure that injection wells are cased and the casing cemented in compliance with3.13 of this title (relating to Casing, Cementing, Drilling, Well Control, and Completion Requirements), in addition to the requirements of this section.5.203(e)(1)(B)(ii) Casing, cement, cement additives, and/or other materials used in the construction of each injection well must have sufficient structural strength and must be of sufficient quality and quantity to maintain integrity over the design life of the injection well. All well materials must be suitable for use with fluids with which the well materials may be expected to come into contact and must meet or exceed test standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards as approved by the director5.203(e)(2)Construction information. The applicant must provide the following information for each well to allow the director to determine whether the proposed well construction and completion design will meet the general performance criteria in paragraph (1) of this subsection:	Section 4.1 – Objectives Section 4.2 – Engineering Design
146.86(b)(1)(i)	Depth to the injection zone(s);	5.203(e)(2)(A) depth to the injection zone;	Section 4.3.4 – Injection Well Completion Stage and Injection Interval, Appendix D

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.86(b)(1)(ii)	Injection pressure, external pressure, internal pressure, and axial loading;	5.203(e)(2)(D) proposed injection rate (intermittent or continuous), maximum proposed surface injection pressure, external pressure, internal pressure, axial loading, and maximum proposed volume and/or mass of the CO2 stream to be injected;	Section 4.5 – Injection Well Operating Strategy, Appendix D
146.86(b)(1)(iii)	Hole size;	5.203(e)(2)(B) hole size;	Section 4.3 – Well Drilling and Completion Design, Appendix D
146.86(b)(1)(iv)	Size and grade of all casing strings (wall thickness, external diameter, nominal weight, length, joint specification, and construction material);	5.203(e)(2)(C) size and grade of all casing and tubing strings (e.g., wall thickness, external diameter, nominal weight, length, joint specification and construction material, tubing tensile, burst, and collapse strengths);	Section 4.2 – Engineering Design, Appendix D
146.86(b)(1)(v)	Corrosiveness of the carbon dioxide stream and formation fluids;	5.203(e)(2)(F) a description of the capability of the materials to withstand corrosion when exposed to a combination of the CO2 stream and formation fluids;	Section 4.2 – Engineering Design Appendix D
146.86(b)(1)(vi)	Down-hole temperatures;	5.203(e)(2)(G) down-hole temperatures and pressures;	4.4.4 Fracture Pressure, Fluid Characteristics, and Downhole Conditions
146.86(b)(1)(vii)	Lithology of injection and confining zone(s);	5.203(e)(2)(H) lithology of injection and confining zones;	Section 2.3 – Major Stratigraphic Units: Confining and Injection Zones Section 2.5 – Site Geology
146.86(b)(1)(viii)	Type or grade of cement and cement additives; and	5.203(e)(2)(I) type or grade of cement and additives;	4.2.2 Production Casing Design and Completion
146.86(b)(1)(ix)	Quantity, chemical composition, and temperature of the carbon dioxide stream.	5.203(e)(2)(J) chemical composition and temperature of the CO2 stream;	Section 1 – Introduction Section 4.5.5 – CO2 Stream Characteristics

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.86(b)(2)	Surface casing must extend through the base of the lowermost USDW and be cemented to the surface through the use of a single or multiple strings of casing and cement.	5.203(e)(1)(B)(iii) Surface casing must extend through the base of the lowermost USDW above the injection zone and must be cemented to the surface.	Section 4.2.2 – Production Casing Design and Completion, Appendix D
146.86(b)(3)	At least one long string casing, using a sufficient number of centralizers, must extend to the injection zone and must be cemented by circulating cement to the surface in one or more stages.	5.203(e)(1)(B)(v) At least one long string casing, using a sufficient number of centralizers, must extend from the surface to the injection zone and must be cemented by circulating cement to the surface in one or more stages. The long string casing must isolate the injection zone and other intervals as necessary for the protection of USDWs and to ensure confinement of the injected and formation fluids to the permitted injection zone using cement and/or other isolation techniques. If the long string casing does not extend through the injection zone, another well string or liner must be cemented through the injection zone (for example, a chrome liner).	Section 4.2.2 – Production Casing Design and Completion, Appendix D
146.86(b)(4)	Circulation of cement may be accomplished by staging. The Director may approve an alternative method of cementing in cases where the cement cannot be recirculated to the surface, provided the owner or operator can demonstrate by using logs that the cement does not allow fluid movement behind the well bore.	5.203(e)(1)(B)(iv) Circulation of cement may be accomplished by staging. The director may approve an alternative method of cementing in cases where the cement cannot be circulated to the surface, provided the applicant can demonstrate by using logs that the cement does not allow fluid movement between the casing and the well bore.	Section 4.2.2 – Production Casing Design and Completion, Appendix D

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.86(b)(5)	Cement and cement additives must be compatible with the carbon dioxide stream and formation fluids and of sufficient quality and quantity to maintain integrity over the design life of the geologic sequestration project. The integrity and location of the cement shall be verified using technology capable of evaluating cement quality radially and identifying the location of channels to ensure that USDWs are not endangered.	5.203(e)(1)(B)(ii) Casing, cement, cement additives, and/or other materials used in the construction of each injection well must have sufficient structural strength and must be of sufficient quality and quantity to maintain integrity over the design life of the injection well. All well materials must be suitable for use with fluids with which the well materials may be expected to come into contact and must meet or exceed test standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards as approved by the director. 5.203(e)(1)(B)(vi) The applicant must verify the integrity and location of the cement using technology capable of radial evaluation of cement quality and identification of the location of channels to ensure that USDWs will not be endangered.	Section 4.1 – Objectives Section 4.2 – Engineering Design
146.86(c)	Tubing and packer.		Section 4.2.3 – Injection Tubing Design and Completion Section 4.2.6 – Injection Tubing Packer Design and Completion

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.86(c)(1)	Tubing and packer materials used in the construction of each Class VI well must be compatible with fluids with which the materials may be expected to come into contact and must meet or exceed standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards acceptable to the Director.	5.203(e)(1)(B)(ii)Casing, cement, cement additives, and/or other materials used in the construction of each injection well must have sufficient structural strength and must be of sufficient quality and quantity to maintain integrity over the design life of the injection well. All well materials must be suitable for use with fluids with which the well materials may be expected to come into contact and must meet or exceed test standards developed for such materials by the American Petroleum Institute, ASTM International, or comparable standards as approved by the director.	Section 4.1 – Objectives Section 4.2.3 – Injection Tubing Design and Completion Section 4.2.6 – Injection Tubing Packer Design and Completion
146.86(c)(2)	All owners or operators of Class VI wells must inject fluids through tubing with a packer set at a depth opposite a cemented interval at the location approved by the Director	5.203(e)(1)(C)(i)Tubing and packer. All injection wells must inject fluids through tubing set on a packer. Packers must be set no higher than 100 feet above the top of the permitted injection interval or at a location approved by the director.	Section 4.2.3 – Injection Tubing Design and Completion Section 4.2.6 – Injection Tubing Packer Design and Completion
146.86(c)(3)	In order for the Director to determine and specify requirements for tubing and packer, the owner or operator must submit the following information:	5.203(e)(2)Construction information. The applicant must provide the following information for each well to allow the director to determine whether the proposed well construction and completion design will meet the general performance criteria in paragraph (1) of this subsection:	See Below
146.86(c)(3)(i)	Depth of setting;	5.203(e)(2)(E) type of packer and packer setting depth;	Section 4.2.3 – Injection Tubing Design and Completion, Appendix D

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.86(c)(3)(ii)	Characteristics of the carbon dioxide stream (chemical content, corrosiveness, temperature, and density) and formation fluids;	5.203(e)(2)(F) a description of the capability of the materials to withstand corrosion when exposed to a combination of the CO2 stream and formation fluids; 5.203(e)(2)(J) chemical composition and temperature of the CO2 stream; and	Section 1 – Introduction Section 4.5.5 – CO2 Stream Characteristics
146.86(c)(3)(iii)	Maximum proposed injection pressure;	5.203(e)(2)(D) proposed injection rate (intermittent or continuous), maximum proposed surface injection pressure, external pressure, internal pressure, axial loading, and maximum proposed volume and/or mass of the CO2 stream to be injected;	Section 4.2.3 – Injection Tubing Design and Completion Section 4.5.1 – Injection Rate and Pressure
146.86(c)(3)(iv)	Maximum proposed annular pressure;		Section 4.5.3 – Annulus Pressure
146.86(c)(3)(v)	Proposed injection rate (intermittent or continuous) and volume and/or mass of the carbon dioxide stream;	5.203(e)(2)(D) proposed injection rate (intermittent or continuous), maximum proposed surface injection pressure, external pressure, internal pressure, axial loading, and maximum proposed volume and/or mass of the CO2 stream to be injected;	Section 4.2.3 – Injection Tubing Design and Completion Section 4.5.1 – Injection Rate and Pressure
146.86(c)(3)(vi)	Size of tubing and casing; and	5.203(e)(2)(C) size and grade of all casing and tubing strings (e.g., wall thickness, external diameter, nominal weight, length, joint specification and construction material, tubing tensile, burst, and collapse strengths	Section 4.2.2 – Production Casing Desing and Completion Section 4.2.3 – Injection Tubing Design and Completion

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.86(c)(3)(vii)	Tubing tensile, burst, and collapse strengths.	5.203(e)(2)(C) size and grade of all casing and tubing strings (e.g., wall thickness, external diameter, nominal weight, length, joint specification and construction material, tubing tensile, burst, and collapse strengths	Section 4.2.2 – Production Casing Desing and Completion Section 4.2.3 – Injection Tubing Design and Completion Section 4.2.5 – Surface Casing Design and Completion
146.82(a)(7)	Proposed operating data for the proposed geologic sequestration site:	5.203(i) Operating information. (1) Operating plan. The applicant must submit a plan for operating the injection wells and the geologic storage facility that complies with the criteria set forth in 5.206(d) of this title, and that outlines the steps necessary to conduct injection operations. The applicant must include the following proposed operating data in the plan:	See Below
146.82(a)(7)(i)	Average and maximum daily rate and volume and/or mass and total anticipated volume and/or mass of the carbon dioxide stream;	5.203(i)(1)(A) the average and maximum daily injection rates, temperature, and volumes and/or mass of the CO2 stream;	Section 4.5.2 – CO2 Volume
146.82(a)(7)(ii)	Average and maximum injection pressure;	5.203(i)(1)(B) the average and maximum surface injection pressure;	Section 4.5.1 – Injection Rate and Pressure
146.82(a)(8)	Proposed pre-operational formation testing program to obtain an analysis of the chemical and physical characteristics of the injection zone(s) and confining zone(s) and that meets the requirements at 146.87;	5.203(c)(2)(F) a description of the formation testing program used and the analytical results used to determine the chemical and physical characteristics of the injection zone and the confining zone; and	Section 4.4 – Pre-Operational Testing Plan
146.82(a)(9)	Proposed stimulation program, a description of stimulation fluids to be used and a determination that stimulation will not interfere with containment;	5.203(e)(4) Well stimulation plan. The applicant must submit a description of the proposed well stimulation program, including a description of the stimulation fluids, and a	Section 4.5.4 – Well Stimulation Procedures

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		determination that well stimulation will not compromise containment.	
146.82(a)(10)	Proposed procedure to outline steps necessary to conduct injection operation;	5.203(i) Operating information. (1) Operating plan. The applicant must submit a plan for operating the injection wells and the geologic storage facility that complies with the criteria set forth in 5.206(d) of this title, and that outlines the steps necessary to conduct injection operations. The applicant must include the following proposed operating data in the plan:	Section 4.5 – Injection Well Operating Strategy
146.82(a)(11)	Schematics or other appropriate drawings of the surface and subsurface construction details of the well;	5.203(e)(2) Construction information. The applicant must provide the following information for each well to allow the director to determine whether the proposed well construction and completion design will meet the general performance criteria in paragraph (1) of this subsection: (K) schematic drawings of the surface and subsurface construction details.	Appendix D
146.82(a)(12)	Injection well construction procedures that meet the requirements of 146.86;	5.203(e) Injection well construction. (1) Criteria for construction of anthropogenic CO2 injection wells. This paragraph establishes the criteria for the information about the construction and casing and cementing of, and special equipment for, anthropogenic CO2 injection wells that an applicant must include in an application.	Section 4.7 – Injection Well Construction and Operation Summary Appendix D

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.87(a)	During the drilling and construction of a Class VI injection well, the owner or operator must run appropriate logs, surveys and tests to determine or verify the depth, thickness, porosity, permeability, and lithology of, and the salinity of any formation fluids in all relevant geologic formations to ensure conformance with the injection well construction requirements under 146.86 and to establish accurate baseline data against which future measurements may be compared. The owner or operator must submit to the Director a descriptive report prepared by a knowledgeable log analyst that includes an interpretation of the results of such logs and tests. At a minimum, such logs and tests must include:	5.203(f) Plan for logging, sampling, and testing of injection wells before injection. The applicant must submit a plan for logging, sampling, and testing of each injection well prior to injection well operation. The plan need not include identical logging, sampling, and testing procedures for all wells provided there is a reasonable basis for different procedures. Such plan is not necessary for existing wells being converted to anthropogenic CO2 injection wells in accordance with this subchapter, to the extent such activities already have taken place. The plan must describe the logs, surveys, and tests to be conducted to verify the depth, thickness, porosity, permeability, and lithology of, and the salinity of any formation fluids in, the formations that are to be used for monitoring, storage, and confinement to assure conformance with the injection well construction requirements set forth in subsection (e) of this section, and to establish accurate baseline data against which future measurements may be compared. The plan must meet the following criteria and must include the following information.	Appendix D

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.87(a)(1)	Deviation checks during drilling on all holes constructed by drilling a pilot hole which is enlarged by reaming or another method. Such checks must be at sufficiently frequent intervals to determine the location of the borehole and to ensure that vertical avenues for fluid movement in the form of diverging holes are not created during drilling; and	5.203(f)(1)(A) During the drilling of any hole that is constructed by drilling a pilot hole that is enlarged by reaming or another method, the operator must perform deviation checks at sufficiently frequent intervals to determine the location of the borehole and to assure that vertical avenues for fluid movement in the form of diverging holes are not created during drilling.	Appendix D
146.87(a)(2)	Before and upon installation of the surface casing:	5.203(f)(1)(B) Before surface casing is installed, the operator must run appropriate logs, such as resistivity, spontaneous potential, and caliper logs.	See Below
146.87(a)(2)(i)	Resistivity, spontaneous potential, and caliper logs before the casing is installed; and	5.203(f)(1)(B) Before surface casing is installed, the operator must run appropriate logs, such as resistivity, spontaneous potential, and caliper logs.	Section 4.4.2 – Injection and Confining Zone Core Sampling
146.87(a)(2)(ii)	A cement bond and variable density log to evaluate cement quality radially, and a temperature log after the casing is set and cemented.	5.203(f)(1)(C) After each casing string is set and cemented, the operator must run logs, such as a cement bond log, variable density log, and a temperature log, to ensure proper cementing.	Section 4.3 Well Drilling and Completion Design Section 4.4.2 – Injection and Confining Zone Core Sampling
146.87(a)(3)	Before and upon installation of the long string casing:	5.203(f)(1)(D) Before long string casing is installed, the operator must run logs appropriate to the geology, such as resistivity, spontaneous potential, porosity, caliper, gamma ray, and fracture finder logs, to gather data necessary to verify the characterization of the geology and hydrology.	See Below

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.87(a)(3)(i)	Resistivity, spontaneous potential, porosity, caliper, gamma ray, fracture finder logs, and any other logs the Director requires for the given geology before the casing is installed; and	5.203(f)(1)(D) Before long string casing is installed, the operator must run logs appropriate to the geology, such as resistivity, spontaneous potential, porosity, caliper, gamma ray, and fracture finder logs, to gather data necessary to verify the characterization of the geology and hydrology.	Section 4.4.2 – Injection and Confining Zone Core Sampling
146.87(a)(3)(ii)	A cement bond and variable density log, and a temperature log after the casing is set and cemented.	5.203(e)(1)(B)(vi) The applicant must verify the integrity and location of the cement using technology capable of radial evaluation of cement quality and identification of the location of channels to ensure that USDWs will not be endangered	Section 4.3 Well Drilling and Completion Design Section 4.4.2 – Injection and Confining Zone Core Sampling
146.87(a)(4)	A series of tests designed to demonstrate the internal and external mechanical integrity of injection wells, which may include:	5.203(h) (2) Mechanical integrity testing plan. The applicant must prepare and submit a mechanical integrity testing plan as part of a permit application. The performance tests must be designed to demonstrate the internal and external mechanical integrity of each injection well. These tests may include:	Section 4.2 – Engineering Design Appendix D
146.87(a)(4)(i)	A pressure test with liquid or gas;	5.203(h)(2)(A) a pressure test with liquid or inert gas;	Section 4.4 – Pre-Operational Testing Plan
146.87(a)(4)(ii)	A tracer survey such as oxygen-activation logging;	5.203(h)(2)(B) a tracer survey such as oxygen-activation logging;	Section 5.4.2 – External Mechanical Integrity Testing
146.87(a)(4)(iii)	A temperature or noise log;	5.203(h)(2)(C) a temperature or noise log;	Section 4.4.2 – Injection and Confining Zone Core Sampling
146.87(a)(4)(iv)	A casing inspection log; and	5.203(h)(2)(D) a casing inspection log; and/or	Section 4.4.2 – Injection and Confining Zone Core Sampling

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.87(a)(5)	Any alternative methods that provide equivalent or better information and that are required by and/or approved of by the Director.	5.203(h)(2)(E) any alternative method approved by the director, and if necessary by the Administrator of EPA under 40 CFR 146.89(e), that provides equivalent or better information approved by the director.	Not Applicable
146.87(b)	The owner or operator must take whole cores or sidewall cores of the injection zone and confining system and formation fluid samples from the injection zone(s), and must submit to the Director a detailed report prepared by a log analyst that includes: Well log analyses (including well logs), core analyses, and formation fluid sample information. The Director may accept information on cores from nearby wells if the owner or operator can demonstrate that core retrieval is not possible and that such cores are representative of conditions at the well. The Director may require the owner or operator to core other formations in the borehole.	5.203(f)(3)(B) The operator must take whole cores or sidewall cores representative of the injection zone and confining zone and formation fluid samples from the injection zone. The director may require the operator to core other formations in the borehole. The director may accept data from cores and formation fluid samples from nearby wells or other data if the operator can demonstrate to the director that such data are representative of conditions at the proposed injection well. The operator must submit to the director a detailed report prepared by a log analyst that includes well log analyses (including well logs), core analyses, and formation fluid sample information.	Section 4.4.2 – Injection and Confining Zone Core Sampling
146.87(c)	The owner or operator must record the fluid temperature, pH, conductivity, reservoir pressure, and static fluid level of the injection zone(s).	5.203(f)(3)(A) The operator must record and submit the formation fluid temperature, pH, and conductivity, the reservoir pressure, and the static fluid level of the injection zone.	Section 4.4.3 – Injection Zone Characterization Appendix D
146.87(d)	At a minimum, the owner or operator must determine or calculate the following information concerning the injection and confining zone(s):	5.203(f)(2)(C) The operator must determine or calculate the fracture pressures for the injection and confining zone. The Commission will include in any permit it might issue a limit of 90% of the fracture pressure to ensure that the injection pressure does not exceed the fracture pressure of the injection zone.	See Below

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.87(d)(1)	Fracture pressure;	5.203(f)(2)(C) The operator must determine or calculate the fracture pressures for the injection and confining zone. The Commission will include in any permit it might issue a limit of 90% of the fracture pressure to ensure that the injection pressure does not exceed the fracture pressure of the injection zone.	Section 4.4.4 – Fracture Pressure, Fluid Characteristics, and Downhole Conditions
146.87(d)(2)	Other physical and chemical characteristics of the injection and confining zone(s); and	5.203(c)(2)(B) the depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of, and the geochemistry of any formation fluids in, the storage reservoir and confining zone and any other relevant geologic formations, including geology/facies changes based on field data, which may include geologic cores, outcrop data, seismic surveys, well logs, and lithologic descriptions, and the analyses of logging, sampling, and testing results used to make such determinations;	Section 4.4.4 – Fracture Pressure, Fluid Characteristics, and Downhole Conditions
146.87(d)(3)	Physical and chemical characteristics of the formation fluids in the injection zone(s).	5.203(c)(2)(B) the depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of, and the geochemistry of any formation fluids in, the storage reservoir and confining zone and any other relevant geologic formations, including geology/facies changes based on field data, which may include geologic cores, outcrop data, seismic surveys, well logs, and lithologic descriptions, and the analyses of logging, sampling, and testing results used to make such determinations;	Section 4.4.4 – Fracture Pressure, Fluid Characteristics, and Downhole Conditions

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.87(e)	Upon completion, but prior to operation, the owner or operator must conduct the following tests to verify hydrogeologic characteristics of the injection zone(s):	5.203 (f)(2) Testing and determination of hydrogeologic characteristics of injection and confining zone.(A) Prior to operation, the operator must conduct tests to verify hydrogeologic characteristics of the injection zone.	See Below
146.87(e)(1)	A pressure fall-off test; and,	5.203(f)(2)(B)The operator must perform an initial pressure fall-off or other test and submit to the director a written report of the results of the test, including details of the methods used to perform the test and to interpret the results, all necessary graphs, and the testing log, to verify permeability, injectivity, and initial pressure using water or CO2.	Section 4.4.5 – Injection and Confining Zone Formation Testing
146.87(e)(2)	A pump test; or		
146.87(e)(3)	Injectivity tests.		
146.87(f)	The owner or operator must provide the Director with the opportunity to witness all logging and testing by this subpart. The owner or operator must submit a schedule of such activities to the Director 30 days prior to conducting the first test and submit any changes to the schedule 30 days prior to the next scheduled test.	5.206(i) Permit conditions for Commission witnessing of testing and logging. The operator must provide the division with the opportunity to witness all planned well workovers, stimulation activities, other than stimulation for formation testing, and testing and logging. The operator must submit a proposed schedule of such activities to the Commission at least 30 days prior to conducting the first such activity and submit notice at least 48 hours in advance of any actual activity. Such activities shall not commence before the end of the 30 days unless authorized by the director.	Section 4.5.4 – Well Stimulation Procedures Appendix D
146.88	Injection well operating requirements		See Below
146.88(a)	Except during stimulation, the owner or operator must ensure that injection pressure does not exceed 90 percent of the fracture	5.206(d)(2)(C) The operator must comply with a maximum surface injection pressure limit approved by the director and specified in the	Section 4.5.1 – Injection Rate and Pressure

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	pressure of the injection zone(s) so as to ensure that the injection does not initiate new fractures or propagate existing fractures in the injection zone(s). In no case may injection pressure initiate fractures in the confining zone(s) or cause the movement of injection or formation fluids that endangers a USDW. Pursuant to requirements at 146.82(a)(9), all stimulation programs must be approved by the Director as part of the permit application and incorporated into the permit.	permit. In approving a maximum surface injection pressure limit, the director must consider the results of well tests and, where appropriate, geomechanical or other studies that assess the risks of tensile failure and shear failure. The director must approve limits that, with a reasonable degree of certainty, will avoid initiation or propagation of fractures in the confining zone or cause otherwise non- transmissive faults or fractures transecting the confining zone to become transmissive. In no case may injection pressure cause movement of injection fluids or formation fluids in a manner that endangers USDWs. The Commission shall include in any permit it might issue a limit of 90 percent of the fracture pressure to ensure that the injection pressure does not initiate new fractures or propagate existing fractures in the injection zone(s). In no case may injection pressure initiate fractures in the confining zone(s) or cause the movement of injection or formation fluids that endangers a USDW. The director may approve a plan for controlled artificial fracturing of the injection zone.5.203(f)(2)(C) The operator must determine or calculate the fracture pressures for the injection and confining zone. The Commission will include in any permit it might issue a limit of 90% of the fracture pressure to ensure that the injection pressure	

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		does not exceed the fracture pressure of the injection zone.	
146.88(b)	Injection between the outermost casing protecting USDWs and the well bore is prohibited.	5.206(d)(2)(A) Injection between the outermost casing protecting USDWs and the well bore is prohibited.	4.2.2 Production Casing Design and Completion
146.88(c)	The owner or operator must fill the annulus between the tubing and the long string casing with a non-corrosive fluid approved by the Director. The owner or operator must maintain on the annulus a pressure that exceeds the operating injection pressure, unless the Director determines that such requirement might harm the integrity of the well or endanger USDWs.	5.206(d)(2)(D)The operator must fill the annulus between the tubing and the long string casing with a corrosion inhibiting fluid approved by the director. The owner or operator must maintain on the annulus a pressure that exceeds the operating injection pressure, unless the director determines that such requirement might harm the integrity of the well or endanger USDWs.	Section 4.2.6 – Injection Tubing and Packer Design and Completion Section 4.3 – Well Drilling and Completion Design
146.88(d)	Other than during periods of well workover (maintenance) approved by the Director in which the sealed tubing-casing annulus is disassembled for maintenance or corrective procedures, the owner or operator must maintain mechanical integrity of the injection well at all times.	5.203(h)(1)(A) Other than during periods of well workover in which the sealed tubing-casing annulus is of necessity disassembled for maintenance or corrective procedures, the operator must maintain mechanical integrity of the injection well at all times.	4.2.2 – Production Casing Design and Completion and Appendix D.1, D.2, and D.3

Section 5 – Testing and Monitoring			
146.87(e)	Upon completion, but prior to operation, the owner or operator must conduct the following tests to verify hydrogeologic characteristics of the injection zone(s):	5.203(f)(2) Testing and determination of hydrogeologic characteristics of injection and confining zone.(A) Prior to operation, the operator must conduct tests to verify hydrogeologic characteristics of the injection zone.	Section 5 – Testing and Monitoring Plan
146.87(e)(1)	A pressure fall-off test; and,	5.203(f)(2)(B)The operator must perform an initial pressure fall-off or other test and	Section 5.7 – Pressure Fall-Off Testing

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		submit to the director a written report of the results of the test, including details of the methods used to perform the test and to interpret the results, all necessary graphs, and the testing log, to verify permeability, injectivity, and initial pressure using water or CO2.	
146.87(e)(2)	A pump test; or		Not Applicable
146.87(e)(3)	Injectivity tests.		4.4.5 Injection and Confining Zone Formation Testing

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.90	The owner or operator of a Class VI well must prepare, maintain, and comply with a testing and monitoring plan to verify that the geologic sequestration project is operating as permitted and is not endangering USDWs. The requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit. The testing and monitoring plan must be submitted with the permit application, for Director approval, and must include a description of how the owner or operator will meet the requirements of this section, including accessing sites for all necessary monitoring and testing during the life of the project. Testing and monitoring associated with geologic sequestration projects must, at a minimum, include:	5.206(e)(1)The operator of an anthropogenic CO2 injection well must maintain and comply with the approved monitoring, sampling, and testing plan to verify that the geologic storage facility is operating as permitted and that the injected fluids are confined to the injection zone. 5.206(a) (1) Each condition applicable to a permit shall be incorporated into the permit either expressly or by reference. If incorporated by reference, a specific citation to the rules in this chapter shall be given in the permit. The requirements listed in this section are directly enforceable regardless of whether the requirement is a condition of the permit. 5.203(j) Plan for monitoring, sampling, and testing after initiation of operation. (1) The applicant must submit a monitoring, sampling, and testing plan for verifying that the geologic storage facility is operating as permitted and that the injected fluids are confined to the injection zone. (2) The plan must include the following:	Section 5.0 – Testing and Monitoring Plan Section 5.1 – Objectives, Appendix E
146.90(a)	Analysis of the carbon dioxide stream with sufficient frequency to yield data representative of its chemical and physical characteristics;	5.203(j)(2)(A) the analysis of the CO2 stream prior to injection with sufficient frequency to yield data representative of its chemical and physical characteristics;	Section 5.5 – Continuous Recording of Operational Parameters During Injection Section 5.11 – Testing Plan Review and Updates,

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
			Appendix E
146.90(b)	Installation and use, except during well workovers as defined in 146.88(d), of continuous recording devices to monitor injection pressure, rate, and volume; the pressure on the annulus between the tubing and the long string casing; and the annulus fluid volume added;	5.203(j)(2)(B) the installation and use of continuous recording devices to monitor injection pressure, rate, temperature, and volume and/or mass, and the pressure on the annulus between the tubing and the long string casing, except during workovers;	Section 5.5 – Continuous Recording of Operational Parameters During Injection, 5.5.1 – Continuous Monitoring of Injection Rate and Volume, 5.5.2 – Continuous Monitoring of Injection Temperature and Pressure at Injection Well, 5.5.3 – Continuous Monitoring Injection Temperature and Pressure in Reservoir, 5.11 – Testing Plan Review and Updates
146.90(c)	Corrosion monitoring of the well materials for loss of mass, thickness, cracking, pitting, and other signs of corrosion, which must be performed on a quarterly basis to ensure that the well components meet the minimum standards for material strength and performance set forth in 146.86(b), by:	5.203(j)(2)(C) after initiation of injection, the performance on a quarterly basis of corrosion monitoring of the well materials for loss of mass, thickness, cracking, pitting, and other signs of corrosion to ensure that the well components meet the minimum standards for material strength and performance set forth in subsection (e)(1)(A) of this section. The operator must report the results of such monitoring semi-annually. Corrosion monitoring may be accomplished by:	Section 5.6 – Corrosion Monitoring, 5.6.1 – Monitoring Location and Frequency, 5.11 – Testing Plan Review Updates, Appendix E

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.90(c)(1)	Analyzing coupons of the well construction materials placed in contact with the carbon dioxide stream; or	5.203(j)(2)(C)(i) analyzing coupons of the well construction materials in contact with the CO2 stream;	Section 5.6.1 – Monitoring Location and Frequency, Appendix E
146.90(c)(2)	Routing the carbon dioxide stream through a loop constructed with the material used in the well and inspecting the materials in the loop; or	5.203(j)(2)(C)(ii) routing the CO2 stream through a loop constructed with the materials used in the well and inspecting the materials in the loop; or	Section 5.6.1 – Monitoring Location and Frequency
146.90(c)(3)	Using an alternative method approved by the Director;	5.203(j)(2)(C)(iii) using an alternative method, materials, or time period approved by the director;	Not Applicable
146.90(d)	Periodic monitoring of the ground water quality and geochemical changes above the confining zone(s) that may be a result of carbon dioxide movement through the confining zone(s) or additional identified zones including:	5.203(j)(2)(D) monitoring of geochemical and geophysical changes, including: (i) periodic sampling of the fluid temperature, pH, conductivity, reservoir pressure and static fluid level of the injection zone and monitoring for pressure changes, and for changes in geochemistry, in a permeable and porous formation near to and above the top confining zone; (ii) periodic monitoring of the quality and geochemistry of a USDW within the AOR and the formation fluid in a permeable and porous formation near to and above the top confining zone to detect any movement of the injected CO2 through the confining zone into that monitored formation;	Section 5.2 – Overall Strategy and Approach for Testing and Monitoring Plan, 5.9 – CO2 Plume Tracking Using Groundwater Monitoring Data, 5.9.3 – USDW Monitoring Well Network, 5.11 – Testing Plan Review and Updates
146.90(d)(1)	The location and number of monitoring wells based on specific information about the geologic sequestration project, including injection rate and volume, geology, the presence of artificial penetrations, and other factors; and	5.203(j)(2)(D)(iii)the location and number of monitoring wells justified on the basis of the AOR, injection rate and volume, geology, and the presence of artificial penetrations and other factors specific to the geologic storage facility; and	Section 5.9.2 – Design of the Monitoring Well Network

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.90(d)(2)	The monitoring frequency and spatial distribution of monitoring wells based on baseline geochemical data that has been collected under 146.82(a)(6) and on any modeling results in the area of review evaluation required by 146.84(c).	5.203(j)(2)(D)(iv) the monitoring frequency and spatial distribution of monitoring wells based on baseline geochemical data collected under subsection (c)(2) of this section and any modeling results in the AOR evaluation;	Section 5.9.2 – Design of the Monitoring Well Network, Appendix E
146.90(e)	A demonstration of external mechanical integrity pursuant to 146.89(c) at least once per year until the injection well is plugged; and, if required by the Director, a casing inspection log pursuant to requirements at 146.89(d) at a frequency established in the testing and monitoring plan;	5.203(h)(1)(D) At least once per year until the injection well is plugged, the operator must confirm the absence of significant fluid movement into a USDW through channels adjacent to the injection wellbore (external integrity) using a method approved by the director (e.g., diagnostic surveys such as oxygen-activation logging or temperature or noise logs).5.203(h)(2) Mechanical integrity testing plan. The applicant must prepare and submit a mechanical integrity testing plan as part of a permit application. The performance tests must be designed to demonstrate the internal and external mechanical integrity of each injection well. These tests may include:((D) a casing inspection log; and/or	Section 5.4.2 – External Mechanical Integrity Testing Section 5.11 – Testing Plan Review and Updates, Appendix E
146.90(f)	A pressure fall-off test at least once every five years unless more frequent testing is required by the Director based on site-specific information;	5.203(j)(2)(G) a pressure fall-off test at least once every five years unless more frequent testing is required by the director based on site-specific information; and	Section 5.7 – Pressure Fall-Off Testing Section 5.12 – Testing Plan Review and Updates, Appendix E
146.90(g)	Testing and monitoring to track the extent of the carbon dioxide plume and the presence or absence of elevated pressure (e.g., the pressure front) by using:	5.203(j)(2)(E) tracking the extent of the CO2 plume and the position of the pressure front by using indirect, geophysical techniques, which may include seismic, electrical, gravity,	Section 5.8 – CO2 Plume and Pressure Front Tracking, Appendix E

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		or electromagnetic surveys and/or down-hole CO2 detection tools;	
146.90(g)(1)	Direct methods in the injection zone(s); and,		Section 5.2 – Overall Strategy and Approach for Testing and Monitoring Plan Section 5.11 – Testing Plan Review and Updates, Appendix E
146.90(g)(2)	Indirect methods (e.g., seismic, electrical, gravity, or electromagnetic surveys and/or down-hole carbon dioxide detection tools), unless the Director determines, based on site-specific geology, that such methods are not appropriate;	5.203(j)(2)(E) tracking the extent of the CO2 plume and the position of the pressure front by using indirect, geophysical techniques, which may include seismic, electrical, gravity, or electromagnetic surveys and/or down-hole CO2 detection tools;	Section 5.2 – Overall Strategy and Approach for Testing and Monitoring Plan, 5.8.2 – Plume and Pressure Front Tracking Using Indirect Geophysical Techniques, 5.11 – Testing Plan Review and Updates, Appendix E
146.90(h)	The Director may require surface air monitoring and/or soil gas monitoring to detect movement of carbon dioxide that could endanger a USDW.	5.203(j)(2)(G) additional monitoring as the director may determine to be necessary to support, upgrade, and improve computational modeling of the AOR evaluation and to determine compliance with the requirements that the injection activity not allow the movement of fluid containing any contaminant into USDWs and that the	Section 5.9.5 – Construction of In-Zone Monitoring Well

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		injected fluid remain within the permitted interval.	
146.90(h)(1)	Design of Class VI surface air and/or soil gas monitoring must be based on potential risks to USDWs within the area of review;		Section 5.3 – Use of Phased and/or Triggered Approach
146.90(h)(2)	The monitoring frequency and spatial distribution of surface air monitoring and/or soil gas monitoring must be decided using baseline data, and the monitoring plan must describe how the proposed monitoring will yield useful information on the area of review delineation and/or compliance with standards under 3603.D;		Section 5.3 – Use of Phased and/or Triggered Approach
146.90(h)(3)	If an owner or operator demonstrates that monitoring employed under 98.440 to 98.449 of this chapter (Clean Air Act, 42 U.S.C. 7401 et seq.) accomplishes the goals of paragraphs (h)(1) and (2) of this section, and meets the requirements pursuant to 146.91(c)(5), a Director that requires surface air/soil gas monitoring must approve the use of monitoring employed under 98.440 to 98.449 of this chapter. Compliance with 98.440 to 98.449 of this chapter pursuant to this provision is considered a condition of the Class VI permit;		Section 5.3 – Use of Phased and/or Triggered Approach

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.90(i)	Any additional monitoring, as required by the Director, necessary to support, upgrade, and improve computational modeling of the area of review evaluation required under 146.84(c) and to determine compliance with standards under 144.12 of this chapter;	5.203(j)(2)(G) additional monitoring as the director may determine to be necessary to support, upgrade, and improve computational modeling of the AOR evaluation and to determine compliance with the requirements that the injection activity not allow the movement of fluid containing any contaminant into USDWs and that the injected fluid remain within the permitted interval.	Not Applicable
146.90(j)	The owner or operator shall periodically review the testing and monitoring plan to incorporate monitoring data collected under this subpart, operational data collected under 146.88, and the most recent area of review reevaluation performed under 146.84(e). In no case shall the owner or operator review the testing and monitoring plan less often than once every five years. Based on this review, the owner or operator shall submit an amended testing and monitoring plan or demonstrate to the Director that no amendment to the testing and monitoring plan is needed. Any amendments to the testing and monitoring plan must be approved by the Director, must be incorporated into the permit, and are subject to the permit modification requirements at 144.39 or 144.41 of this chapter, as appropriate. Amended plans or demonstrations shall be submitted to the Director as follows:	5.207(a)(2)(E) Annual updates. The operator must maintain and update required plans in accordance with the provisions of this subchapter. (i) Operators must submit an annual statement, signed by an appropriate company official, confirming that the operator has: (I) reviewed the monitoring and operational data that are relevant to a decision on whether to reevaluate the AOR and the monitoring and operational data that are relevant to a decision on whether to update an approved plan required by 5.203 or 5.206 of this title; and (II) determined whether any updates were warranted by material change in the monitoring and operational data or in the evaluation of the monitoring and operational data by the operator. (ii) Operators must submit either the updated plan or a summary of the modifications for each plan for which an update the operator	Section 5.11 – Testing Plan Review and Updates, Appendix E

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		determined to be warranted pursuant to subclause (I) of this clause. The director may require submission of copies of any updated plans and/or additional information regarding whether or not updates of any particular plans are warranted.	
146.90(j)(1)	Within one year of an area of review reevaluation;	5.207(a)(2)(E) Annual updates. The operator must maintain and update required plans in accordance with the provisions of this subchapter.	Section 5.11 – Testing Plan Review and Updates
146.90(j)(2)	Following any significant changes to the facility, such as addition of monitoring wells or newly permitted injection wells within the area of review, on a schedule determined by the Director; or	5.207(a)(3) The director may require the revision of any required plan following any significant changes to the facility, such as addition of injection or monitoring wells, on a schedule determined by the director or whenever the director determines that such a	Section 5.9.5 – Construction of In-Zone Monitoring Well, Appendix E

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		revision is necessary to comply with the requirements of this subchapter.	
146.90(j)(3)	When required by the Director.	5.207(a)(3) The director may require the revision of any required plan following any significant changes to the facility, such as addition of injection or monitoring wells, on a schedule determined by the director or whenever the director determines that such a revision is necessary to comply with the requirements of this subchapter.	Section 5.9.5 – Construction of In-Zone Monitoring Well
146.90(k)	A quality assurance and surveillance plan for all testing and monitoring requirements.	5.203(a)(4) Reports. An applicant must ensure that all descriptive reports are prepared by a qualified and knowledgeable person and include an interpretation of the results of all logs, surveys, sampling, and tests required in this subchapter. The applicant must include in the application a quality assurance and surveillance plan for all testing and monitoring, which includes, at a minimum, validation of the analytical laboratory data, calibration of field instruments, and an explanation of the sampling and data acquisition techniques.	Appendix E
146.89(a)	A Class VI well has mechanical integrity if:	5.102(36)(A) An anthropogenic CO2 injection well has mechanical integrity if:	Section 5.4 – Mechanical Integrity Test Methods
146.89(a)(1)	There is no significant leak in the casing, tubing, or packer; and	5.102(36)(A)(i) there is no significant leak in the casing, tubing, or packer; and	Section 5.4 – Mechanical Integrity Test Methods

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.89(a)(2)	There is no significant fluid movement into a USDW through channels adjacent to the injection well bore.	5.102(36)(A)(ii)there is no significant fluid movement into a stratum containing an underground source of drinking water through channels adjacent to the injection well bore as a result of operation of the injection well.	Section 5.4 – Mechanical Integrity Test Methods
146.89(b)	To evaluate the absence of significant leaks under paragraph (a)(1) of this section, owners or operators must, following an initial annulus pressure test, continuously monitor injection pressure, rate, injected volumes; pressure on the annulus between tubing and long-string casing; and annulus fluid volume as specified in 146.88 (e);	5.203(h)(1)(C) Following an initial annulus pressure test, the operator must continuously monitor injection pressure, rate, temperature, injected volumes and mass, and pressure on the annulus between tubing and long string casing to confirm that the injected fluids are confined to the injection zone. If mass is determined using volume, the operator must provide calculations.	Section 5.5 – Continuous Recording of Operational Parameters During Injection
146.89(b)	To evaluate the absence of significant leaks under paragraph (a)(1) of this section, owners or operators must, following an initial annulus pressure test, continuously monitor injection pressure, rate, injected volumes; pressure on the annulus between tubing and long-string casing; and annulus fluid volume as specified in 146.88 (e);	5.203(h)(1)(C) Following an initial annulus pressure test, the operator must continuously monitor injection pressure, rate, temperature, injected volumes and mass, and pressure on the annulus between tubing and long string casing to confirm that the injected fluids are confined to the injection zone. If mass is determined using volume, the operator must provide calculations.	Section 5.5 – Continuous Recording of Operational Parameters During Injection
146.89(c)	At least once per year, the owner or operator must use one of the following methods to determine the absence of significant fluid movement under paragraph (a)(2) of this section:	(D) At least once per year until the injection well is plugged, the operator must confirm the absence of significant fluid movement into a USDW through channels adjacent to the injection wellbore (external integrity) using a method approved by the director (e.g., diagnostic surveys such as oxygen-activation logging or temperature or noise logs).	Section 5.4.2 – External Mechanical Integrity Testing

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.89(c)(1)	An approved tracer survey such as an oxygen-activation log; or	5.203(h)(2)(B) a tracer survey such as oxygen-activation logging;	Section 5.4.2 – External Mechanical Integrity Testing
146.89(c)(2)	A temperature or noise log.	5.203(h)(2)(C) a temperature or noise log;	Section 5.4.2 – External Mechanical Integrity Testing
146.89(d)	If required by the Director, at a frequency specified in the testing and monitoring plan required at 146.90, the owner or operator must run a casing inspection log to determine the presence or absence of corrosion in the long-string casing.	5.203(h)(2)(D) a casing inspection log; and/or	Section 5.6.3 – Cement Evaluation and Casing Inspection Logs
146.89(e)	The Director may require any other test to evaluate mechanical integrity under paragraphs (a)(1) or (a)(2) of this section. Also, the Director may allow the use of a test to demonstrate mechanical integrity other than those listed above with the written approval of the Administrator. To obtain approval for a new mechanical integrity test, the Director must submit a written request to the Administrator setting forth the proposed test and all technical data supporting its use. The Administrator may approve the request if he or she determines that it will reliably demonstrate the mechanical integrity of wells for which its use is proposed. Any alternate method approved by the Administrator will be published in the Federal Register and may be used in all States in accordance with applicable State law unless its use is restricted at the time of approval by the Administrator.	5.203(h)(2)(E) any alternative method approved by the director, and if necessary by the Administrator of EPA under 40 CFR 146.89(e), that provides equivalent or better information approved by the director.	Not Applicable

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.89(f)	In conducting and evaluating the tests enumerated in this section or others to be allowed by the Director, the owner or operator and the Director must apply methods and standards generally accepted in the industry. When the owner or operator reports the results of mechanical integrity tests to the Director, he/she shall include a description of the test(s) and the method(s) used. In making his/her evaluation, the Director must review monitoring and other test data submitted since the previous evaluation.	5.207 Reporting and Record-Keeping(a) Reporting requirements. The operator of a geologic storage facility must provide, at a minimum, the following reports to the director and retain the following information.(1) Test records. The operator must file a complete record of all tests in duplicate with the district office within 30 days after the testing. In conducting and evaluating the tests enumerated in this subchapter or others to be allowed by the director, the operator and the director must apply methods and standards generally accepted in the industry. When the operator reports the results of mechanical integrity tests to the director, the operator must include a description of any tests and methods used. In making this evaluation, the director must review monitoring and other test data submitted since the previous evaluation.	Section 5.10 – Reporting Requirements
146.89(g)	The Director may require additional or alternative tests if the results presented by the owner or operator under paragraphs (a) through (d) of this section are not satisfactory to the Director to demonstrate that there is no significant leak in the casing, tubing, or packer, or to demonstrate that there is no significant movement of fluid into a USDW resulting from the injection activity as stated in paragraphs (a)(1) and (2) of this section.	5.206(f)(5) The director may require additional or alternative tests if the results presented by the operator do not demonstrate to the director that there is no significant leak in the casing, tubing, or packer or movement of fluid into or between formations containing USDWs resulting from the injection activity.	Not Applicable

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.91	The owner or operator must, at a minimum, provide, as specified in paragraph (e) of this section, the following reports to the Director, for each permitted Class VI well:	5.207 (a) Reporting requirements. The operator of a geologic storage facility must provide, at a minimum, the following reports to the director and retain the following information.	See Below
146.91(a)	Semi-annual reports containing:	5.207(a)(2)(C) Semi-annual report. The operator must report:	See Below
146.91(a)(1)	Any changes to the physical, chemical, and other relevant characteristics of the carbon dioxide stream from the proposed operating data;	5.207(a)(2)(C)(ii) changes to the source as well as the physical, chemical, and other relevant characteristics of the CO2 stream from the proposed operating data;	Section 5.10 – Reporting Requirements
146.91(a)(2)	Monthly average, maximum, and minimum values for injection pressure, flow rate and volume, and annular pressure;	5.207(a)(2)(C)(iii) monthly average, maximum and minimum values for injection pressure, flow rate, temperature, and volume and/or mass, and annular pressure	Section 5.10 – Reporting Requirements
146.91(a)(3)	A description of any event that exceeds operating parameters for annulus pressure or injection pressure specified in the permit;	5.207(a)(2)(C)(v) a description of any event that significantly exceeds operating parameters for annulus pressure or injection pressure as specified in the permit;	Section 5.10 – Reporting Requirements
146.91(a)(4)	A description of any event which triggers a shut-off device required pursuant to 146.88(e) and the response taken;	5.207(a)(2)(C)(vi) a description of any event that triggers a shutdown device and the response taken; and	Section 5.10 – Reporting Requirements
146.91(a)(5)	The monthly volume and/or mass of the carbon dioxide stream injected over the reporting period and the volume injected cumulatively over the life of the project;	5.207(a)(2)(C)(iii) monthly average, maximum and minimum values for injection pressure, flow rate, temperature, and volume and/or mass, and annular pressure	Section 5.10 – Reporting Requirements
146.91(a)(6)	Monthly annulus fluid volume added; and	5.207(a)(2)(C)(iv) monthly annulus fluid volume added;	Section 5.10 – Reporting Requirements
146.91(a)(7)	The results of monitoring prescribed under 146.90.	5.207(a)(2)(C)(vii) the results of monitoring prescribed under	Section 5.10 – Reporting Requirements

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		5.206(e) of this title (relating to Permit Standards).	
146.91(b)	Report, within 30 days, the results of:	5.207(a)(2)(B) Report within 30 days. The operator must report:	See Below
146.91(b)(1)	Periodic tests of mechanical integrity;	5.207(a)(2)(B)(i) the results of periodic tests for mechanical integrity;	Section 5.4.3 – Reporting Results of MIT
146.91(b)(2)	Any well workover; and,	5.207(a)(2)(B)(iii) a description of any well workover.	Section 5.10 – Reporting Requirements
146.91(b)(3)	Any other test of the injection well conducted by the permittee if required by the Director.	5.207(a)(2)(B)(ii) the results of any other test of the injection well conducted by the operator if required by the director; and	Not Applicable
146.91(c)	Report, within 24 hours:	5.207(a)(2)(A) Report within 24 hours. The operator must report the items listed in clauses (i) through (v) of this subparagraph to the director and the appropriate district office orally as soon as practicable, but within 24 hours of discovery, and in writing within five working days of discovery. The written submission shall contain a description of the noncompliance and its cause, the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue, and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. The operator shall report the following items:	Section 5.10 – Reporting Requirements
146.91(c)(1)	Any evidence that the injected carbon dioxide stream or associated pressure front may cause an endangerment to a USDW;	5.207(a)(2)(A)(ii) any evidence that the injected CO2 stream or associated pressure	Section 5.10 – Reporting Requirements

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		front may cause an endangerment to a USDW;	
146.91(c)(2)	Any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs;	5.207(a)(2)(A)(iii) any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDWs;	Section 5.10 – Reporting Requirements
146.91(c)(3)	Any triggering of a shut-off system (i.e., down-hole or at the surface);	5.206(d)(2)(F)(ii) If an automatic shutdown is triggered or a loss of mechanical integrity is discovered, the operator must immediately investigate and identify as expeditiously as possible the cause. If, upon investigation, the well appears to be lacking mechanical integrity, or if monitoring otherwise indicates that the well may be lacking mechanical integrity, the operator must: (III) notify the director as soon as practicable, but within 24 hours;	Section 5.10 – Reporting Requirements
146.91(c)(4)	Any failure to maintain mechanical integrity; or.	5.206(d)(2)(F)(ii) If an automatic shutdown is triggered or a loss of mechanical integrity is discovered, the operator must immediately investigate and identify as expeditiously as possible the cause. If, upon investigation, the well appears to be lacking mechanical integrity, or if monitoring otherwise indicates that the well may be lacking mechanical integrity, the operator must:(III) notify the director as soon as practicable, but within 24 hours;	Section 5.10 – Reporting Requirements
146.91(c)(5)	Pursuant to compliance with the requirement at 146.90(h) for surface air/soil gas monitoring or other monitoring technologies, if required by the Director, any release of		Not Applicable

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	carbon dioxide to the atmosphere or biosphere.		
146.91(d)	Owners or operators must notify the Director in writing 30 days in advance of:	5.206(i) Commission witnessing of testing and logging. The operator must provide the division with the opportunity to witness all planned well workovers, stimulation activities, other than stimulation for formation testing, and testing and logging. The operator must submit a proposed schedule of such activities to the Commission at least 30 days prior to conducting the first such activity and submit notice at least 48 hours in advance of any actual activity. Such activities shall not commence before the end of the 30 days unless authorized by the director.	See Below
146.91(d)(1)	Any planned well workover;	5.207(a)(2)(B)(iii) a description of any well workover. 5.206(i) Commission witnessing of testing and logging. The operator must provide the division with the opportunity to witness all planned well workovers, stimulation activities, other than stimulation for formation testing, and testing and logging. The operator must submit a proposed schedule of such activities to the Commission at least 30 days prior to conducting the first	Section 5.10 – Reporting Requirements

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		such activity and submit notice at least 48 hours in advance of any actual activity. Such activities shall not commence before the end of the 30 days unless authorized by the director.	
146.91(d)(2)	Any planned stimulation activities, other than stimulation for formation testing conducted under 146.82; and	5.206(i) Commission witnessing of testing and logging. The operator must provide the division with the opportunity to witness all planned well workovers, stimulation activities, other than stimulation for formation testing, and testing and logging. The operator must submit a proposed schedule of such activities to the Commission at least 30 days prior to conducting the first such activity and submit notice at least 48 hours in advance of any actual activity. Such activities shall not commence before the end of the 30 days unless authorized by the director.	Section 5.4 – Mechanical Integrity Test Methods

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.91(d)(3)	Any other planned test of the injection well conducted by the permittee.	5.207(a)(2)(B)(i) the results of periodic tests for mechanical integrity; (ii) the results of any other test of the injection well conducted by the operator if required by the director; and 5.206(i) Commission witnessing of testing and logging. The operator must provide the division with the opportunity to witness all planned well workovers, stimulation activities, other than stimulation for formation testing, and testing and logging. The operator must submit a proposed schedule of such activities to the Commission at least 30 days prior to conducting the first such activity and submit notice at least 48 hours in advance of any actual activity. Such activities shall not commence before the end of the 30 days unless authorized by the director.	Section 5.4 – Mechanical Integrity Test Methods

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.91(e)	Regardless of whether a State has primary enforcement responsibility, owners or operators must submit all required reports, submittals, and notifications under subpart H of this part to EPA in an electronic format approved by EPA.	5.203 (a)(1)(A) Form and filing. Each applicant for a permit to construct and operate a geologic storage facility must file an application with the division in Austin on a form prescribed by the Commission. The applicant must file the application and all attachments with the division and with EPA Region 6 in an electronic format approved by EPA. On the same date, the applicant must file one copy with each appropriate district office and one copy with the Executive Director of the Texas Commission on Environmental Quality. 5.207(b)(2) The operator must submit all required reports, submittals, and notifications under this subchapter to the director and to the EPA in an electronic format approved by the director and the Regional Administrator, respectively.	Section 5.10 – Reporting Requirements
146.91(f)	Records shall be retained by the owner or operator as follows:	5.206(m) (2)The permittee shall retain records as follows:	Section 5.10 – Reporting Requirements
146.91(f)(1)	All data collected under 146.82 for Class VI permit applications shall be retained throughout the life of the geologic sequestration project and for 10 years following site closure.	5.206(m) (2) (A) All data collected under 5.203 of this title for Class VI permit applications shall be retained throughout the life of the geologic storage project and for 10 years following site closure.	Section 5.10 – Reporting Requirements
146.91(f)(2)	Data on the nature and composition of all injected fluids collected pursuant to 146.90(a) shall be retained until 10 years after site closure. The Director may require the owner or operator to deliver the records to the	5.206(m) (2) (B) Data on the nature and composition of all injected fluids collected pursuant to 5.203(i)(1)(D) of this title shall be retained until 10 years following site closure. The director may require the operator to	Section 5.10 – Reporting Requirements

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	Director at the conclusion of the retention period.	submit the records to the director at the conclusion of the retention period.	
146.91(f)(3)	Monitoring data collected pursuant to 146.90(b) through (i) shall be retained for 10 years after it is collected.	5.206(m) (2) (C) Monitoring data collected pursuant to 5.203(j)(2) of this title shall be retained for 10 years after it is collected.	Section 5.10 – Reporting Requirements
146.91(f)(4)	Well plugging reports, post-injection site care data, including, if appropriate, data and information used to develop the demonstration of the alternative post-injection site care timeframe, and the site closure report collected pursuant to requirements at 146.93(f) and (h) shall be retained for 10 years following site closure.	5.206(m) (2) (D) Well plugging reports, post-injection site care data, including data and information used to develop the demonstration of the alternative post-injection site care timeframe, and the site closure report collected pursuant to requirements of subsection (k)(6) of this section and paragraph (4) of this subsection shall be retained for 10 years following site closure.	Section 5.10 – Reporting Requirements
146.91(f)(5)	The Director has authority to require the owner or operator to retain any records required in this subpart for longer than 10 years after site closure.	5.206(m) (2) (E)The director has authority to require the operator to retain any records required in this subchapter for longer than 10 years following site closure.	Section 5.10 – Reporting Requirements
146.88(e)(1)	Continuous recording devices to monitor: The injection pressure; the rate, volume and/or mass, and temperature of the carbon dioxide stream; and the pressure on the annulus between the tubing and the long string casing and annulus fluid volume; and	5.206(d)(2)(E) The operator must install and use continuous recording devices to monitor the injection pressure, and the rate, volume, and temperature of the CO2 stream. The operator must monitor the pressure on the annulus between the tubing and the long string casing. The operator must continuously record, continuously monitor, or control by a preset high-low pressure sensor switch the wellhead pressure of each injection well.	Section 5.5 – Continuous Recording of Operational Parameters During Injection, 5.8 – CO2 Plume and Pressure Front Tracking 5.10 – Reporting Requirements Table 5-10

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
Section 6 – Plugging Plan			
146.92(a)	Prior to the well plugging, the owner or operator must flush each Class VI injection well with a buffer fluid, determine bottomhole reservoir pressure, and perform a final external mechanical integrity test.	5.203(k) Well plugging plan. The applicant must submit a well plugging plan for all injection wells and monitoring wells that includes the following: (2) proposals for activities to be undertaken prior to plugging an injection well, specifically: (A) flushing each injection well with a buffer fluid; (B) performing tests or measures to determine bottomhole reservoir pressure; (C) performing final tests to assess mechanical integrity; and	Section 6.2.1 – Flushing Well with Kill Weight Fluid, 6.2.4 – Planned External MITs, 6.3.2 – Final P&A
146.92(b)	Well plugging plan. The owner or operator of a Class VI well must prepare, maintain, and comply with a plan that is acceptable to the Director. The requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit. The well plugging plan must be submitted as part of the permit application and must include the following information:	5.206 (a)(1)Each condition applicable to a permit shall be incorporated into the permit either expressly or by reference. If incorporated by reference, a specific citation to the rules in this chapter shall be given in the permit. The requirements listed in this section are directly enforceable regardless of whether the requirement is a condition of the permit.5.206(j) Permit conditions for well plugging. The operator of a geologic storage facility must maintain and comply with the approved well plugging plan required by5.203(k) of this title.5.203(k)Well plugging plan. The applicant must submit a well plugging plan for all injection wells and monitoring wells that includes the following:	Section 6.1 – Objectives Section 6.3 – Injection Well Zonal Isolation and Final P&A
146.92(b)(1)	Appropriate tests or measures for determining bottomhole reservoir pressure;	5.203(k)(2)(B)performing tests or measures to determine bottomhole reservoir pressure;	Section 6.1 – Objectives Section 6.2.3 – Planned

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
			Tests or Measures to Determine Bottomhole Pressure
146.92(b)(2)	Appropriate testing methods to ensure external mechanical integrity as specified in 146.89;	5.203(k)(2)(C) performing final tests to assess mechanical integrity; and	Section 6.1 – Objectives Section 6.3.2 – Final P&A; Section 6.4 – Notification and Record Keeping
146.92(b)(3)	The type and number of plugs to be used;	5.203(k)(1)(A)the type and number of plugs to be used;	Section 6.1 – Objectives Section 6.2.5 – CO2 Compatible Materials; Section 6.4 – Notification and Record Keeping; Tables 6-4, 6-5, and 6-6
146.92(b)(4)	The placement of each plug, including the elevation of the top and bottom of each plug;	5.203(k)(1)(B)the placement of each plug, including the elevation of the top and bottom of each plug;	Tables 6-4, 6-5, and 6-6
146.92(b)(5)	The type, grade, and quantity of material to be used in plugging. The material must be compatible with the carbon dioxide stream; and	5.203(k)(1)(C) the type, grade, and quantity of material to be used in plugging and information to demonstrate that the material is compatible with the CO2 stream; and	Section 6.2.5 – CO2-Compatible Materials, Tables 6-4, 6-5, and 6-6
146.92(b)(6)	The method of placement of the plugs.	5.203(k)(1)(D)the method of placement of the plugs;	Section 6.2.5 – CO2 – Compatible Materials, Tables 6-4, 6-5, and 6-6

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.92(c)	Notice of intent to plug. The owner or operator must notify the Director in writing pursuant to 146.91(e), at least 60 days before plugging of a well. At this time, if any changes have been made to the original well plugging plan, the owner or operator must also provide the revised well plugging plan. The Director may allow for a shorter notice period. Any amendments to the injection well plugging plan must be approved by the Director, must be incorporated into the permit, and are subject to the permit modification requirements at 144.39 or 144.41 of this chapter, as appropriate.	5.203(k)(3) a proposal for giving notice of intent to plug monitoring wells that penetrate the base of usable quality water and all injection wells. The applicant's plan must ensure that: (A) the operator notifies the director at least 60 days before plugging a well. At this time, if any changes have been made to the original well plugging plan, the operator must also provide a revised well plugging plan. At the discretion of the director, an operator may be allowed to proceed with well plugging on a shorter notice period; and (B) the operator will file a notice of intention to plug and abandon (Form W-3A) a well with the appropriate Commission district office and the division in Austin at least five days prior to the beginning of plugging operations;	Section 6.3.2 – Final P&A; Section 6.6 – Amendments to the P&A Plan

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.92(d)	Plugging report. Within 60 days after plugging, the owner or operator must submit, pursuant to 146.91(e), a plugging report to the Director. The report must be certified as accurate by the owner or operator and by the person who performed the plugging operation (if other than the owner or operator.) The owner or operator shall retain the well plugging report for 10 years following site closure.	5.203(k)(4) a plugging report for monitoring wells that penetrate the base of usable quality water and all injection wells. The applicant's plan must ensure that within 30 days after plugging the operator will file a complete well plugging record (Form W-3) in duplicate with the appropriate district office. The operator and the person who performed the plugging operation (if other than the operator) must certify the report as accurate;5.206(m)(6)The operator must retain for 10 years following storage facility closure records collected to prepare the permit application, data on the nature and composition of all injected fluids, and records collected during the post-injection storage facility care period. The operator must submit the records to the director at the conclusion of the retention period, and the records must thereafter be retained at the Austin headquarters of the Commission.	Section 6.3.2 – Final P&A
146.82(a)(16)	Proposed injection well plugging plan required by 146.92(b);	5.203(k) Well plugging plan. The applicant must submit a well plugging plan for all injection wells and monitoring wells that includes the following:	Section 6.1 – Objectives Section 6.3 – Injection Well Zonal Isolation and Final P&A

Section 7 – Post Injection Site Care and Closure Plan			
146.82(a)(17)	Proposed post-injection site care and site closure plan required by 146.93(a);	5.203 (m) Post-injection storage facility care and closure plan. The applicant must submit a post-injection storage facility care and closure plan. The plan must include:	Section 7 – Post-Injection Site Care and Site Closure Plan

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.82(a)(18)	At the Director's discretion, a demonstration of an alternative post-injection site care timeframe required by 146.93(c);	(8) information submitted to support the demonstration in paragraph (1) of this subsection, which shall meet the following criteria: (A) all analyses and tests performed to support the demonstration must be accurate, reproducible, and performed in accordance with the established quality assurance standards; (B) estimation techniques must be appropriate and EPA-certified test protocols must be used where available; (C) predictive models must be appropriate and tailored to the site conditions, composition of the CO2 stream, and injection and site conditions over the life of the geologic storage project; (D) predictive models must be calibrated using existing information (e.g., at Class I, Class II, or Class V experimental technology well sites) where sufficient data are available; (E) reasonably conservative values and modeling assumptions must be used and disclosed to the director whenever values are estimated on the basis of known, historical information instead of site-specific measurements; (F) an analysis must be performed to identify and assess aspects of the alternative post-injection storage facility care timeframe demonstration that contribute significantly to uncertainty. The operator must conduct sensitivity analyses to determine the effect that significant uncertainty may contribute to the modeling demonstration; (G) an approved quality assurance and quality	Not Applicable

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		control plan must address all aspects of the demonstration; and (H) any additional criteria required by the director.	
146.93(a)	The owner or operator of a Class VI well must prepare, maintain, and comply with a plan for post-injection site care and site closure that meets the requirements of paragraph (a)(2) of this section and is acceptable to the Director. The requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit.	5.203(k) (1) (A) Post-injection storage facility care and closure plan. (A)The operator of an injection well must maintain and comply with the approved post-injection storage facility care and closure plan. 5.206 (a) (1) Each condition applicable to a permit shall be incorporated into the permit either expressly or by reference. If incorporated by reference, a specific citation to the rules in this chapter shall be given in the permit. The requirements listed in this section are directly enforceable regardless of whether the requirement is a condition of the permit.	Section 7 – Post-Injection Site Care and Site Closure Plan
146.93(a)(1)	The owner or operator must submit the post-injection site care and site closure plan as a part of the permit application to be approved by the Director.	5.203(m) Post-injection storage facility care and closure plan.	Section 7 – Post-Injection Site Care and Site Closure Plan
146.93(a)(2)	The post-injection site care and site closure plan must include the following information:	5.203(m) Post-injection storage facility care and closure plan. The applicant must submit a post-injection storage facility care and closure plan. The plan must include:	See Below
146.93(a)(2)(i)	The pressure differential between pre-injection and predicted post-injection pressures in the injection zone(s);	5.203(m)(2)the pressure differential between pre-injection and predicted post-injection pressures in the injection zone;	Section 7.1 – Objectives; Section 7.2 – Calculation of Pre- and Post-Injection Pressure Differentials; Table 7-1: Maximum Pressure

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
			Differential by Year for Injection Wells No. 01, No. 02, and No. 03
146.93(c)	Demonstration of alternative post-injection site care timeframe. At the Director's discretion, the Director may approve, in consultation with EPA, an alternative post-injection site care timeframe other than the 50 year default, if an owner or operator can demonstrate during the permitting process that an alternative post-injection site care timeframe is appropriate and ensures non-endangerment of USDWs. The demonstration must be based on significant, site-specific data and information including all data and information collected pursuant to 146.82 and 146.83, and must contain substantial evidence that the geologic sequestration project will no longer pose a risk of endangerment to USDWs at the end of the alternative post-injection site care timeframe.		Not Applicable
146.93(c)(1)	A demonstration of an alternative post-injection site care timeframe must include consideration and documentation of:	5.203(m) Post-injection storage facility care and closure plan. The applicant must submit a post-injection storage facility care and closure plan. The plan must include: (7) consideration and documentation of:	Not Applicable
146.93(c)(1)(i)	The results of computational modeling performed pursuant to delineation of the area of review under 146.84;	5.203(m)(7)(A) the results of computational modeling performed pursuant to delineation of the AOR under subsection (d) of this section;	Not Applicable
146.93(c)(1)(ii)	The predicted timeframe for pressure decline within the injection zone, and any other zones, such that formation fluids may not be	5.203(m)(7)(B) the predicted timeframe for pressure decline within the injection zone, and any other zones, such that formation	Not Applicable

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	forced into any USDWs; and/or the timeframe for pressure decline to pre-injection pressures;	fluids may not be forced into any USDWs, and/or the timeframe for pressure decline to pre- injection pressures;	
146.93(c)(1)(ix)	A description of the well construction and an assessment of the quality of plugs of all abandoned wells within the area of review;	5.203(m)(7)(I) a description of the well construction and an assessment of the quality of plugs of all abandoned wells within the AOR;	Not Applicable
146.93(c)(1)(viii)	The presence of potential conduits for fluid movement including planned injection wells and project monitoring wells associated with the proposed geologic sequestration project or any other projects in proximity to the predicted/modeled, final extent of the carbon dioxide plume and area of elevated pressure;	5.203(m)(7)(H) the presence of potential conduits for fluid movement including planned injection wells and project monitoring wells associated with the proposed geologic storage project or any other projects in proximity to the predicted/modeled, final extent of the CO2 plume and area of elevated pressure;	Not Applicable
146.93(c)(2)	Information submitted to support the demonstration in paragraph (c)(1) of this section must meet the following criteria:	5.203(m)(8) information submitted to support the demonstration in paragraph (1) of this subsection, which shall meet the following criteria:	Not Applicable
146.93(c)(2)(i)	All analyses and tests performed to support the demonstration must be accurate, reproducible, and performed in accordance with the established quality assurance standards;	5.203(m)(8)(A) all analyses and tests performed to support the demonstration must be accurate, reproducible, and performed in accordance with the established quality assurance standards;	Not Applicable
146.93(c)(2)(ii)	Estimation techniques must be appropriate and EPA-certified test protocols must be used where available;	5.203(m)(8)(B)estimation techniques must be appropriate and EPA-certified test protocols must be used where available;	Not Applicable
146.93(c)(2)(iii)	Predictive models must be appropriate and tailored to the site conditions, composition of the carbon dioxide stream and injection and site conditions over the life of the geologic sequestration project;	5.203(m)(8)(C)predictive models must be appropriate and tailored to the site conditions, composition of the CO2 stream, and injection and site conditions over the life of the geologic storage project;	Not Applicable

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.93(c)(2)(iv)	Predictive models must be calibrated using existing information (e.g., at Class I, Class II, or Class V experimental technology well sites) where sufficient data are available;	5.203(m)(8)(D)predictive models must be calibrated using existing information (e.g., at Class I, Class II, or Class V experimental technology well sites) where sufficient data are available;	Not Applicable
146.93(c)(2)(v)	Reasonably conservative values and modeling assumptions must be used and disclosed to the Director whenever values are estimated on the basis of known, historical information instead of site-specific measurements;	5.203(m)(8)(E) reasonably conservative values and modeling assumptions must be used and disclosed to the director whenever values are estimated on the basis of known, historical information instead of site-specific measurements;	Not Applicable
146.93(c)(2)(vi)	An analysis must be performed to identify and assess aspects of the alternative post-injection site care timeframe demonstration that contribute significantly to uncertainty. The owner or operator must conduct sensitivity analyses to determine the effect that significant uncertainty may contribute to the modeling demonstration.	5.203(m)(8)(F) an analysis must be performed to identify and assess aspects of the alternative post-injection storage facility care timeframe demonstration that contribute significantly to uncertainty. The operator must conduct sensitivity analyses to determine the effect that significant uncertainty may contribute to the modeling demonstration;	Not Applicable
146.93(c)(2)(vii)	An approved quality assurance and quality control plan must address all aspects of the demonstration; and,	5.203(m)(8)(G) an approved quality assurance and quality control plan must address all aspects of the demonstration; and	Not Applicable
146.93(c)(2)(viii)	Any additional criteria required by the Director.	5.203(m)(8)(H) any additional criteria required by the director.	Not Applicable
146.93(a)(2)(ii)	The predicted position of the carbon dioxide plume and associated pressure front at site closure as demonstrated in the area of review evaluation required under 146.84(c)(1);	5.203(m)(3)the predicted position of the CO2 plume and associated pressure front at closure as demonstrated in the AOR evaluation required under subsection (d) of this section;	Section 7.3 – Predicted Position of the CO2 Plume and Pressure Front at Site Closure

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.93(a)(2)(iii)	A description of post-injection monitoring location, methods, and proposed frequency;	5.203(m)(4) a description of the proposed post-injection monitoring location, methods, and frequency;	Section 7.4 – Post-Injection Monitoring Plan; Section 7.4.2 – Monitoring Above the UCCZ and USDW; Section 7.4.3 – In-Zone CO2 Plume and Pressure Front Tracking;
146.93(a)(2)(iv)	A proposed schedule for submitting post-injection site care monitoring results to the Director pursuant to 146.91(e); and,	5.203(m)(5) a proposed schedule for submitting post- injection storage facility care monitoring results to the director;	7.4.4 – Submitting PISC Monitoring Results
146.93(a)(2)(v)	The duration of the post-injection site care timeframe and, if approved by the Director, the demonstration of the alternative post-injection site care timeframe that ensures non-endangerment of USDWs.		Section 7.1 – Objectives; Section 7.4.3 – In-Zone CO2 Plume and Pressure Front Tracking
146.93(a)(3)	Upon cessation of injection, owners or operators of Class VI wells must either submit an amended post-injection site care and site closure plan or demonstrate to the Director through monitoring data and modeling results that no amendment to the plan is needed. Any amendments to the post-injection site care and site closure plan must be approved by the Director, be incorporated into the permit, and are subject to the permit modification requirements at 144.39 or 144.41 of this chapter, as appropriate.	5.206(k)(1)(C) Upon cessation of injection, the operator of a geologic storage facility must either submit an amended plan or demonstrate to the director through monitoring data and modeling results that no amendment to the plan is needed.5.206(k)(1)(B) The operator must update the plan in accordance with 5.207(a)(2)(D)(vi) of this title. At any time during the life of the geologic sequestration project, the operator may modify and resubmit the post- injection site care and site closure plan for the director's approval within 30 days of such change. Any amendments to the post-injection site care and site closure plan must be approved by the director, be incorporated into the permit, and are subject	Section 7.4.1 – PISC and Site Closure Plan Reviews and Amendments

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		to the permit modification requirements in 5.202 of this title, as appropriate.	
146.93(a)(4)	At any time during the life of the geologic sequestration project, the owner or operator may modify and resubmit the post-injection site care and site closure plan for the Director's approval within 30 days of such change.	5.206(k)(1)(B) The operator must update the plan in accordance with 5.207(a)(2)(D)(vi) of this title. At any time during the life of the geologic sequestration project, the operator may modify and resubmit the post- injection site care and site closure plan for the director's approval within 30 days of such change. Any amendments to the post-injection site care and site closure plan must be approved by the director, be incorporated into the permit, and are subject to the permit modification requirements in 5.202 of this title, as appropriate.	Section 7.4.1 – PISC and Site Closure Plan Reviews and Amendments

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.93(b)	The owner or operator shall monitor the site following the cessation of injection to show the position of the carbon dioxide plume and pressure front and demonstrate that USDWs are not being endangered.	5.206(k)(2) Post-injection storage facility monitoring. Following cessation of injection, the operator must continue to conduct monitoring as specified in the approved plan until the director determines that the position of the CO2 plume and pressure front are such that the geologic storage facility will not endanger USDWs.	Section 7.1 – Objectives
146.93(b)(1)	Following the cessation of injection, the owner or operator shall continue to conduct monitoring as specified in the Director-approved post-injection site care and site closure plan for at least 50 years or for the duration of the alternative timeframe approved by the Director pursuant to requirements in paragraph (c) of this section, unless he/she makes a demonstration under (b)(2) of this section. The monitoring must continue until the geologic sequestration project no longer poses an endangerment to USDWs and the demonstration under (b)(2) of this section is submitted and approved by the Director.	5.206(k)(2) Post-injection storage facility monitoring. Following cessation of injection, the operator must continue to conduct monitoring as specified in the approved plan until the director determines that the position of the CO2 plume and pressure front are such that the geologic storage facility will not endanger USDWs.	Section 7.1 – Objectives

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.93(b)(2)	If the owner or operator can demonstrate to the satisfaction of the Director before 50 years or prior to the end of the approved alternative timeframe based on monitoring and other site-specific data, that the geologic sequestration project no longer poses an endangerment to USDWs, the Director may approve an amendment to the post-injection site care and site closure plan to reduce the frequency of monitoring or may authorize site closure before the end of the 50-year period or prior to the end of the approved alternative timeframe, where he or she has substantial evidence that the geologic sequestration project no longer poses a risk of endangerment to USDWs.	5.206(k)(2) Post-injection storage facility monitoring. Following cessation of injection, the operator must continue to conduct monitoring as specified in the approved plan until the director determines that the position of the CO2 plume and pressure front are such that the geologic storage facility will not endanger USDWs.	Section 7.1 – Objectives

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.93(b)(3)	Prior to authorization for site closure, the owner or operator must submit to the Director for review and approval a demonstration, based on monitoring and other site-specific data, that no additional monitoring is needed to ensure that the geologic sequestration project does not pose an endangerment to USDWs.	5.206(k)(3) Prior to closure. Prior to authorization for storage facility closure, the operator must demonstrate to the director, based on monitoring, other site-specific data, and modeling that is reasonably consistent with site performance that no additional monitoring is needed to assure that the geologic storage facility will not endanger USDWs. The operator must demonstrate, based on the current understanding of the site, including monitoring data and/or modeling, all of the following: (A) the estimated magnitude and extent of the facility footprint (the CO2 plume and the area of elevated pressure); (B) that there is no leakage of either CO2 or displaced formation fluids that will endanger USDWs; (C) that the injected or displaced fluids are not expected to migrate in the future in a manner that encounters a potential leakage pathway into USDWs; (D) that the injection wells at the site completed into or through the injection zone or confining zone will be plugged and abandoned in accordance with these requirements; and (E) any remaining facility monitoring wells will be properly plugged or are being managed by a person and in a manner approved by the director.	Section 7.5 – Demonstration of Non-Endangerment of USDW; Figure 7-3 Extent of Maximum CO2 Plume and Pressure Front Stabilized 55 Years from Start of Injection; Section 7.4.2 – Monitoring Above the UCCZ and USDW; Section 7.6.3 – Site Restoration;

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.93(b)(4)	If the demonstration in paragraph (b)(3) of this section cannot be made (i.e., additional monitoring is needed to ensure that the geologic sequestration project does not pose an endangerment to USDWs) at the end of the 50-year period or at the end of the approved alternative timeframe, or if the Director does not approve the demonstration, the owner or operator must submit to the Director a plan to continue post-injection site care until a demonstration can be made and approved by the Director.		Not Applicable
146.93(d)	Notice of intent for site closure. The owner or operator must notify the Director in writing at least 120 days before site closure. At this time, if any changes have been made to the original post-injection site care and site closure plan, the owner or operator must also provide the revised plan. The Director may allow for a shorter notice period.	5.206(k)(4)Notice of intent for storage facility closure. The operator must notify the director in writing at least 120 days before storage facility closure. At the time of such notice, if the operator has made any changes to the original plan, the operator also must provide the revised plan. The director may approve a shorter notice period.	Section 7.6 Site Closure Plan
146.93(e)	After the Director has authorized site closure, the owner or operator must plug all monitoring wells in a manner which will not allow movement of injection or formation fluids that endangers a USDW.	5.206(k)(5) Authorization for storage facility closure. No operator may initiate storage facility closure until the director has approved closure of the storage facility in writing. After the director has authorized storage facility closure, the operator must plug all wells in accordance with the approved plan required by 5.203(k) of this title and submit a plugging record (Form W-3) as required by 3.14 of this title (relating to Plugging).	Section 7.6 Site Closure Plan

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.93(f)	The owner or operator must submit a site closure report to the Director within 90 days of site closure, which must thereafter be retained at a location designated by the Director for 10 years. The report must include:	5.206(k)(6) Storage facility closure report. Once the director has authorized storage facility closure, the operator must submit a storage facility closure report within 90 days that must thereafter be retained by the Commission in Austin. The report must include the following information:	Section 7.1 – Objectives; Section 7.6 – Site Closure Plan
146.93(f)(1)	Documentation of appropriate injection and monitoring well plugging as specified in 146.92 and paragraph (e) of this section. The owner or operator must provide a copy of a survey plat which has been submitted to the local zoning authority designated by the Director. The plat must indicate the location of the injection well relative to permanently surveyed benchmarks. The owner or operator must also submit a copy of the plat to the Regional Administrator of the appropriate EPA Regional Office;	5.206(k)(6)(A) documentation of appropriate injection and monitoring well plugging. The operator must provide a copy of a survey plat that has been submitted to the Regional Administrator of Region 6 of the EPA. The plat must indicate the location of the injection well relative to permanently surveyed benchmarks including the Latitude/Longitude or X/Y coordinates of the surface location in the NAD 27, NAD 83, or WGS 84 coordinate system, a labeled scale bar, and northerly direction arrow;	Section 7.6.4 – Documentation of Site Closure
146.93(f)(2)	Documentation of appropriate notification and information to such State, local and Tribal authorities that have authority over drilling activities to enable such State, local, and Tribal authorities to impose appropriate conditions on subsequent drilling activities that may penetrate the injection and confining zone(s); and	5.206(k)(6)(B) documentation of appropriate notification and information to such state and local authorities as have authority over drilling activities to enable such state and local authorities to impose appropriate conditions on subsequent drilling activities that may penetrate the injection and confining zones; and	Section 7.6.4 – Documentation of Site Closure
146.93(f)(3)	Records reflecting the nature, composition, and volume of the carbon dioxide stream.	5.206(k)(6)(C) records reflecting the nature, composition, volume and mass of the CO2 stream. If mass is determined using volume, the operator must provide calculations.	Section 7.6.4 – Documentation of Site Closure

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.93(g)	Each owner or operator of a Class VI injection well must record a notation on the deed to the facility property or any other document that is normally examined during title search that will in perpetuity provide any potential purchaser of the property the following information:	5.206(l)Permit conditions for deed notation. The operator of a geologic storage facility must record a notation on the deed to the facility property; on any other document that is normally examined during title search; or on any other document that is acceptable to the county clerk for filing in the official public records of the county that will in perpetuity provide any potential purchaser of the property the following information:	Section 7.6.4 – Documentation of Site Closure
146.93(g)(1)	The fact that land has been used to sequester carbon dioxide;	5.206(l)(2) that land has been used to geologically store CO2 ;	Section 7.6.4 – Documentation of Site Closure
146.93(g)(2)	The name of the State agency, local authority, and/or Tribe with which the survey plat was filed, as well as the address of the Environmental Protection Agency Regional Office to which it was submitted; and	5.206(l)(3) that the survey plat has been filed with the Commission; 5.206(l)(4) the address of the office of the United States Environmental Protection Agency, Region 6, to which the operator sent a copy of the survey plat; and	Section 7.6.4 – Documentation of Site Closure
146.93(g)(3)	The volume of fluid injected, the injection zone or zones into which it was injected, and the period over which injection occurred.	5.206(l)(5) the volume and mass of fluid injected, the injection zone or zones into which it was injected, and the period over which injection occurred. If mass is determined using volume, the operator must provide calculations.	Section 7.6.4 – Documentation of Site Closure
146.93(h)	The owner or operator must retain for 10 years following site closure, records collected during the post-injection site care period. The owner or operator must deliver the records to the Director at the conclusion of the retention period, and the records must	5.206(m)(6) The operator must retain for 10 years following storage facility closure records collected to prepare the permit application, data on the nature and composition of all injected fluids, and records collected during the post-injection storage facility care period. The operator must submit	Section 7.6.4 – Documentation of Site Closure

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	thereafter be retained at a location designated by the Director for that purpose.	the records to the director at the conclusion of the retention period, and the records must thereafter be retained at the Austin headquarters of the Commission.	

Section 8 – Emergency Response			
146.82(a)(19)	Proposed emergency and remedial response plan required by 146.94(a);	5.203(l) Emergency and remedial response plan. The applicant must submit an emergency and remedial response plan that:	Section 8 – Emergency and Remedial Response Plan
146.84(f)	The emergency and remedial response plan (as required by 146.94) and the demonstration of financial responsibility (as described by 146.85) must account for the area of review delineated as specified in paragraph (c)(1) of this section or the most recently evaluated area of review delineated under paragraph (e) of this section, regardless of whether or not corrective action in the area of review is phased.	5.203(l) (1) Emergency and remedial response plan. The applicant must submit an emergency and remedial response plan that: (1) accounts for the entire AOR, regardless of whether or not corrective action in the AOR is phased;	Section 8 – Emergency and Remedial Response Plan Figure 8-2
146.88(e)(2)	Alarms and automatic surface shut-off systems or, at the discretion of the Director, down-hole shut-off systems (e.g., automatic shut-off, check valves) for onshore wells or, other mechanical devices that provide equivalent protection; and	5.206(d)(2)(F) (i) The operator must comply with the following requirements for alarms and automatic shut-off systems. (i) The operator must install and use alarms and automatic shut-off systems designed to alert the operator and shut-in the well when operating parameters such as annulus pressure, injection rate or other parameters diverge from permitted ranges and/or gradients. On offshore wells, the automatic shut-off systems must be installed down-hole.	8.6 Response Plans for Risk Scenarios

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.88(e)(3)	Alarms and automatic down-hole shut-off systems for wells located offshore but within State territorial waters, designed to alert the operator and shut-in the well when operating parameters such as annulus pressure, injection rate, or other parameters diverge beyond permitted ranges and/or gradients specified in the permit.	5.206(d)(2)(F) (i) The operator must comply with the following requirements for alarms and automatic shut-off systems.(i) The operator must install and use alarms and automatic shut-off systems designed to alert the operator and shut-in the well when operating parameters such as annulus pressure, injection rate or other parameters diverge from permitted ranges and/or gradients. On offshore wells, the automatic shut-off systems must be installed down-hole.	Not Applicable
146.88(f)	If a shutdown (i.e., down-hole or at the surface) is triggered or a loss of mechanical integrity is discovered, the owner or operator must immediately investigate and identify as expeditiously as possible the cause of the shutoff. If, upon such investigation, the well appears to be lacking mechanical integrity, or if monitoring required under paragraph (e) of this section otherwise indicates that the well may be lacking mechanical integrity, the owner or operator must:	5.206(d)(2)(F) (ii) If an automatic shutdown is triggered or a loss of mechanical integrity is discovered, the operator must immediately investigate and identify as expeditiously as possible the cause. If, upon investigation, the well appears to be lacking mechanical integrity, or if monitoring otherwise indicates that the well may be lacking mechanical integrity, the operator must:	Section 8.6 – Response Plans for Risk Scenarios
146.88(f)(1)	Immediately cease injection;	(I) immediately cease injection;	Section 8.6 – Response Plans for Risk Scenarios
146.88(f)(2)	Take all steps reasonably necessary to determine whether there may have been a release of the injected carbon dioxide stream or formation fluids into any unauthorized zone;	(II) take all steps reasonably necessary to determine whether there may have been a release of the injected CO2 stream into any unauthorized zone;	Section 8.6.3 – Injection Well Monitoring Equipment Failure
146.88(f)(3)	Notify the Director within 24 hours;	5.206(d)(2)(F)(ii)(III) notify the director as soon as practicable, but within 24 hours;	Section 8.6 – Response Plans for Risk Scenarios

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.88(f)(4)	Restore and demonstrate mechanical integrity to the satisfaction of the Director prior to resuming injection; and	5.206(d)(2)(F)(ii)(IV) restore and demonstrate mechanical integrity to the satisfaction of the director prior to resuming injection; and	Section 8.6 – Response Plans for Risk Scenarios
146.88(f)(5)	Notify the Director when injection can be expected to resume.	5.206(d)(2)(F)(ii)(V) notify the director when injection can be expected to resume.	Section 8.6 – Response Plans for Risk Scenarios
146.94	Emergency and remedial response		
146.94(a)	As part of the permit application, the owner or operator must provide the Director with an emergency and remedial response plan that describes actions the owner or operator must take to address movement of the injection or formation fluids that may cause an endangerment to a USDW during construction, operation, and post-injection site care periods. The requirement to maintain and implement an approved plan is directly enforceable regardless of whether the requirement is a condition of the permit.	5.203(l)Emergency and remedial response plan. The applicant must submit an emergency and remedial response plan that: (2) describes actions to be taken to address escape from the permitted injection interval or movement of the injection fluids or formation fluids that may cause an endangerment to USDWs during construction, operation, closure, and post-closure periods; 5.206(a)(1) Each condition applicable to a permit shall be incorporated into the permit either expressly or by reference. If incorporated by reference, a specific citation to the rules in this chapter shall be given in the permit. The requirements listed in this section are directly enforceable regardless of whether the requirement is a condition of the permit.	Section 8.6 – Response Plans for Risk Scenarios
146.94(b)	If the owner or operator obtains evidence that the injected carbon dioxide stream and associated pressure front may cause an endangerment to a USDW, the owner or operator must:	5.206(g)(3)(A) If an operator obtains evidence that the injected CO2 stream and associated pressure front may cause an endangerment to USDWs, the operator must:	Section 8.6 – Response Plans for Risk Scenarios

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.94(b)(1)	Immediately cease injection;	5.206(g)(4)(A)(i) immediately cease injection;	Section 8.6 – Response Plans for Risk Scenarios
146.94(b)(2)	Take all steps reasonably necessary to identify and characterize any release;	5.206(h)(3)(A)(ii) take all steps reasonably necessary to identify and characterize any release;	Section 8.6 – Response Plans for Risk Scenarios
146.94(b)(3)	Notify the Director within 24 hours; and	5.206(h)(3)(A)(iii) notify the director as soon as practicable but within at least 24 hours; and	Section 8.6 – Response Plans for Risk Scenarios
146.94(b)(4)	Implement the emergency and remedial response plan approved by the Director.	5.206(h)(3)(A)(iv) implement the approved emergency and remedial response plan.	Section 8.6 – Response Plans for Risk Scenarios
146.94(c)	The Director may allow the operator to resume injection prior to remediation if the owner or operator demonstrates that the injection operation will not endanger USDWs.	5.206(h)(4)Resumption of injection. The director may allow the operator to resume injection prior to remediation if the operator demonstrates that the injection operation will not endanger USDWs.	Section 8.6 – Response Plans for Risk Scenarios
146.94(d)	The owner or operator shall periodically review the emergency and remedial response plan developed under paragraph (a) of this section. In no case shall the owner or operator review the emergency and remedial response plan less often than once every five years. Based on this review, the owner or operator shall submit an amended emergency and remedial response plan or demonstrate to the Director that no amendment to the emergency and remedial response plan is needed. Any amendments to the emergency and remedial response plan must be approved by the Director, must be incorporated into the permit, and are subject to the permit modification requirements at 144.39 or 144.41 of this chapter, as	5.207(a)(2)(E) Annual updates. The operator must maintain and update required plans in accordance with the provisions of this subchapter. (i) Operators must submit an annual statement, signed by an appropriate company official, confirming that the operator has: (I) reviewed the monitoring and operational data that are relevant to a decision on whether to reevaluate the AOR and the monitoring and operational data that are relevant to a decision on whether to update an approved plan required by 5.203 or 5.206 of this title; and (II) determined whether any updates were warranted by material change in the	Section 8.10 – Plan Review

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	appropriate. Amended plans or demonstrations shall be submitted to the Director as follows:	monitoring and operational data or in the evaluation of the monitoring and operational data by the operator. (ii) Operators must submit either the updated plan or a summary of the modifications for each plan for which an update the operator determined to be warranted pursuant to subclause (I) of this clause. The director may require submission of copies of any updated plans and/or additional information regarding whether or not updates of any particular plans are warranted.	
146.94(d)(1)	Within one year of an area of review reevaluation;		
146.94(d)(2)	Following any significant changes to the facility, such as addition of injection or monitoring wells, on a schedule determined by the Director; or	5.207(a)(3) The director may require the revision of any required plan following any significant changes to the facility, such as addition of injection or monitoring wells, on a schedule determined by the director or whenever the director determines that such a revision is necessary to comply with the requirements of this subchapter.	Section 8.10 – Plan Review
146.94(d)(3)	When required by the Director.	5.207(a)(3) The director may require the revision of any required plan following any significant changes to the facility, such as addition of injection or monitoring wells, on a schedule determined by the director or whenever the director determines that such a revision is necessary to comply with the requirements of this subchapter.	Section 8.10 – Plan Review

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
Section 9 – Financial Assurance			
146.82(a)(14)	A demonstration, satisfactory to the Director, that the applicant has met the financial responsibility requirements under 146.85;	5.203(n) Fees, financial responsibility, and financial assurance. The applicant must pay the fees, demonstrate that it has met the financial responsibility requirements, and provide the Commission with financial assurance as required under 5.205 of this title (relating to Fees, Financial Responsibility, and Financial Assurance).	Section 9.2 – Financial Assurance Demonstration
146.85(a)(6)(ii)	When using a third-party instrument to demonstrate financial responsibility, the owner or operator must provide a proof that the third-party providers either have passed financial strength requirements based on credit ratings; or has met a minimum rating, minimum capitalization, and ability to pass the bond rating when applicable.		Section 9.2 – Financial Assurance Demonstration
146.84(f)	The emergency and remedial response plan (as required by 146.94) and the demonstration of financial responsibility (as described by 146.85) must account for the area of review delineated as specified in paragraph (c)(1) of this section or the most recently evaluated area of review delineated under paragraph (e) of this section, regardless of whether or not corrective action in the area of review is phased.	5.203(l) (1) Emergency and remedial response plan. The applicant must submit an emergency and remedial response plan that: (1) accounts for the entire AOR, regardless of whether or not corrective action in the AOR is phased;	Section 9.7 – Emergency and Remedial Response

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85	Financial responsibility		Section 9.2 – Financial Assurance Demonstration
146.85(a)	The owner or operator must demonstrate and maintain financial responsibility as determined by the Director that meets the following conditions:	5.205(b)(1)A person to whom a permit is issued under this subchapter must provide annually to the director evidence of financial responsibility that is satisfactory to the director. The owner or operator must demonstrate and maintain financial responsibility for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the director has provided written verification that the director has determined that the facility has reached the end of the post-injection storage facility care period.	Section 9.3 – Estimated Coverage Amounts
146.85(a)(1)	The financial responsibility instrument(s) used must be from the following list of qualifying instruments:	5.205 (c)(2)(A)The applicant must include in an application for a geologic storage facility permit:	Section 9.0 – Introduction

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(a)(1)(ii)	Surety Bonds.	5.205(c)(2)(A)(ii) a copy of the form of the bond or letter of credit that will be filed with the Commission;5.205(c)(2)(B) A geologic storage facility shall not receive CO2 until a bond or letter of credit in an amount approved by the director under this subsection and meeting the requirements of this subsection as to form and issuer has been filed with and approved by the director.5.205(c)(2)(D)(i) The issuer of any geologic storage facility bond filed in satisfaction of the requirements of this subsection must be a corporate surety authorized to do business in Texas. The form of bond filed under this subsection must provide that the bond be renewed and continued in effect until the conditions of the bond have been met or its release is authorized by the director.	Not Applicable

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(a)(1)(iii)	Letter of Credit.	5.205(c)(2)(A)(ii) a copy of the form of the bond or letter of credit that will be filed with the Commission; 5.205(c)(2)(B) A geologic storage facility shall not receive CO2 until a bond or letter of credit in an amount approved by the director under this subsection and meeting the requirements of this subsection as to form and issuer has been filed with and approved by the director. 5.205(c)(2)(D)(ii) Any letter of credit filed in satisfaction of the requirements of this subsection must be issued by and drawn on a bank authorized under state or federal law to operate in Texas. The letter of credit must be an irrevocable, standby letter of credit subject to the requirements of Texas Business and Commerce Code, 5.101 – 5.118. The letter of credit must provide that it will be renewed and continued in effect until the conditions of the letter of credit have been met or its release is authorized by the director.	Not Applicable
146.85(a)(1)(i)	Trust Funds.		Not Applicable
146.85(a)(1)(vii)	Any other instrument(s) satisfactory to the Director.		Section 9.2 – Financial Assurance Demonstration

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(a)(2)	The qualifying instrument(s) must be sufficient to cover the cost of:	5.205(c)(2)(C)The determination of the amount of financial assurance for a geologic storage facility is subject to the following requirements:5.205(b)(1) A person to whom a permit is issued under this subchapter must provide annually to the director evidence of financial responsibility that is satisfactory to the director. The owner or operator must demonstrate and maintain financial responsibility for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the director has provided written verification that the director has determined that the facility has reached the end of the post-injection storage facility care period.	Section 9.4 – Corrective Action
146.85(a)(2)(i)	Corrective action (that meets the requirements of 146.84);	5.205(b)(1) A person to whom a permit is issued under this subchapter must provide annually to the director evidence of financial responsibility that is satisfactory to the director. The owner or operator must demonstrate and maintain financial responsibility for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the director has provided written verification that the director has determined that the facility has reached the end of the post-injection storage facility care period.	Section 9.4 – Corrective Action

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(a)(2)(ii)	Injection well plugging (that meets the requirements of 146.92);	5.205(b)(1) A person to whom a permit is issued under this subchapter must provide annually to the director evidence of financial responsibility that is satisfactory to the director. The owner or operator must demonstrate and maintain financial responsibility for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the director has provided written verification that the director has determined that the facility has reached the end of the post-injection storage facility care period.	Section 9.4 – Corrective Action Section – 9.5 Well Plugging Section – 9.6 Post-Injection Site Care and Site Closure Plan Section 9.7 – Emergency and Remedial Response
146.85(a)(2)(iii)	Post injection site care and site closure (that meets the requirements of 146.93); and	5.205(b)(1) A person to whom a permit is issued under this subchapter must provide annually to the director evidence of financial responsibility that is satisfactory to the director. The owner or operator must demonstrate and maintain financial responsibility for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the director has provided written verification that the director has determined that the facility has reached the end of the post-injection storage facility care period.	Section 9.6 – Post-Injection Site Care and Site Closure Plan

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(a)(2)(iv)	Emergency and remedial response (that meets the requirements of 146.94).	5.205(b)(1) A person to whom a permit is issued under this subchapter must provide annually to the director evidence of financial responsibility that is satisfactory to the director. The owner or operator must demonstrate and maintain financial responsibility for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the director has provided written verification that the director has determined that the facility has reached the end of the post-injection storage facility care period.	Section 9.7 – Emergency and Remedial Response
146.85(a)(3)	The financial responsibility instrument(s) must be sufficient to address endangerment of underground sources of drinking water.	5.205(c)(2)(C) The determination of the amount of financial assurance for a geologic storage facility is subject to the following requirements: (i) The director must approve the dollar amount of the financial assurance. The amount of financial assurance required to be filed under this subsection must be equal to or greater than the maximum amount necessary to perform corrective action, emergency response, and remedial action, post-injection monitoring and site care, and closure of the geologic storage facility, including plugging of wells, at any time during the permit term in accordance with all applicable state laws, Commission rules and orders, and the permit. The cost estimate must be performed for each phase separately and must be based on the costs to the	Section 9.5 – Well Plugging

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		Commission of hiring a third party to perform the required activities. A third party is a party who is not within the corporate structure of the owner or operator;	
146.85(a)(4)	The qualifying financial responsibility instrument(s) must comprise protective conditions of coverage.		Section 9.3 – Estimated Coverage Amounts
146.85(a)(4)(i)	Protective conditions of coverage must include at a minimum cancellation, renewal, and continuation provisions, specifications on when the provider becomes liable following a notice of cancellation if there is a failure to renew with a new qualifying financial instrument, and requirements for the provider to meet a minimum rating, minimum capitalization, and ability to pass the bond rating when applicable.	5.205(c)(2)(D)(iii) The qualifying financial responsibility instruments must comprise protective conditions of coverage. Protective conditions of coverage must include at a minimum cancellation, renewal, and continuation provisions; specifications on when the provider becomes liable following a notice of cancellation if there is a failure to renew with a new qualifying financial instrument; and requirements for the provider to meet a minimum rating, minimum capitalization, and ability to pass the bond rating when applicable.	Section 9.3 – Estimated Coverage Amounts

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(a)(4)(i)(A)	Cancellation – for purposes of this part, an owner or operator must provide that their financial mechanism may not cancel, terminate or fail to renew except for failure to pay such financial instrument. If there is a failure to pay the financial instrument, the financial institution may elect to cancel, terminate, or fail to renew the instrument by sending notice by certified mail to the owner or operator and the Director. The cancellation must not be final for 120 days after receipt of cancellation notice. The owner or operator must provide an alternate financial responsibility demonstration within 60 days of notice of cancellation, and if an alternate financial responsibility demonstration is not acceptable (or possible), any funds from the instrument being cancelled must be released within 60 days of notification by the Director.	5.205(c)(2)(D)(iii)(I) Cancellation. An owner or operator must provide that its financial instrument may not cancel, terminate, or fail to renew except for failure to pay such financial instrument. If there is a failure to pay the financial instrument, the financial institution may elect to cancel, terminate, or fail to renew the instrument by sending notice by certified mail to the owner or operator and the director. The cancellation must not be final until at least 120 days after the Commission receives the cancellation notice. The owner or operator must provide an alternate financial responsibility demonstration within 60 days of notice of cancellation, and if an alternate financial responsibility demonstration is not acceptable or possible, any funds from the instrument being cancelled must be released within 60 days of notification by the director.	Section 9.3 – Estimated Coverage Amounts
146.85(a)(4)(i)(B)	Renewal – for purposes of this part, owners or operators must renew all financial instruments, if an instrument expires, for the entire term of the geologic sequestration project. The instrument may be automatically renewed as long as the owner or operator has the option of renewal at the face amount of the expiring instrument. The automatic renewal of the instrument must, at a minimum, provide the holder with the option of renewal at the face amount of the expiring financial instrument.	5.205(c)(2)(D)(iii)(II) Renewal. If a financial instrument expires, the owner or operator must renew the financial instrument for the entire term of the geologic storage project. The instrument may be automatically renewed as long as the operator has the option of renewal at the face amount of the expiring instrument. The automatic renewal of the instrument must, at a minimum, provide the holder with the option of renewal at the face amount of the expiring financial instrument.	Section 9.3 – Estimated Coverage Amounts

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(a)(4)(i)(C)	Cancellation, termination, or failure to renew may not occur and the financial instrument will remain in full force and effect in the event that on or before the date of expiration: The Director deems the facility abandoned; or the permit is terminated or revoked or a new permit is denied; or closure is ordered by the Director or a U.S. district court or other court of competent jurisdiction; or the owner or operator is named as debtor in a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code; or the amount due is paid.	5.205(c)(2)(D)(iii)(III) Financial instrument to remain in effect. Cancellation, termination, or failure to renew shall not occur and the financial instrument shall remain in full force and effect if on or before the date of expiration: (-a-) the director deems the facility abandoned; (-b-) the permit is terminated or revoked or a new permit is denied; (-c-) closure is ordered by the director or a United States district court or other court of competent jurisdiction; (-d-) the owner or operator is named as debtor in a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code; or (-e-) the amount due is paid.	Section 9.3 – Estimated Coverage Amounts
146.85(a)(5)	The qualifying financial responsibility instrument(s) must be approved by the Director.	5.205(c)(2)(B) A geologic storage facility shall not receive CO2 until a bond or letter of credit in an amount approved by the director under this subsection and meeting the requirements of this subsection as to form and issuer has been filed with and approved by the director.	Section 9.3 – Estimated Coverage Amounts
146.85(a)(5)(i)	The Director shall consider and approve the financial responsibility demonstration for all the phases of the geologic sequestration project prior to issue a Class VI permit (146.82).	5.205(c)(2)(B) A geologic storage facility shall not receive CO2 until a bond or letter of credit in an amount approved by the director under this subsection and meeting the requirements of this subsection as to form and issuer has been filed with and approved by the director.	Section 9.3 – Estimated Coverage Amounts

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(a)(5)(ii)	The owner or operator must provide any updated information related to their financial responsibility instrument(s) on an annual basis and if there are any changes, the Director must evaluate, within a reasonable time, the financial responsibility demonstration to confirm that the instrument(s) used remain adequate for use. The owner or operator must maintain financial responsibility requirements regardless of the status of the Director's review of the financial responsibility demonstration.	5.205(c)(2)(F)The owner or operator of a geologic storage facility must provide to the director, and the director must approve, annual written updates of the cost estimate to increase or decrease the cost estimate to account for any changes to the AOR and corrective action plan, the emergency response and remedial action plan, the injection well plugging plan, and the post-injection storage facility care and closure plan. The Director must approve any decrease or increase to the initial cost estimate. During the active life of the geologic storage project, the owner or operator must revise the cost estimate no later than 60 days after the director has approved the request to modify the AOR and corrective action plan, the injection well plugging plan, the post-injection storage facility care and closure plan, and the emergency and response plan, if a change in any of these plans increases the cost. If a change to a plan decreases the cost, any withdrawal of funds must be approved by the director. Any decrease to the value of a financial assurance instrument must first be approved by the director. The revised cost estimate must be adjusted for inflation as specified at paragraph (2)(E) of this subsection. The owner or operator must provide to the director, within 60 days of notification by the director, an adjustment of the cost estimate if the director determines	Section 9.4 – Corrective Action

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		during the annual evaluation of the qualifying financial responsibility instruments that the most recent demonstration is no longer adequate to cover the cost of corrective action, injection well plugging and post-injection storage facility care and closure, and emergency and remedial response.	
146.85(a)(5)(iii)	The Director may disapprove the use of a financial instrument if he determines that it is not sufficient to meet the requirements of this section.		Section 9.3 – Estimated Coverage Amounts
146.85(a)(6)	The owner or operator may demonstrate financial responsibility by using one or multiple qualifying financial instruments for specific phases of the geologic sequestration project.		Section 9.2 – Financial Assurance Demonstration
146.85(a)(6)(i)	In the event that the owner or operator combines more than one instrument for a specific geologic sequestration phase (e.g., well plugging), such combination must be limited to instruments that are not based on financial strength or performance (i.e., self insurance or performance bond), for example trust funds, surety bonds guaranteeing payment into a trust fund, letters of credit, escrow account, and insurance. In this case, it is the combination of mechanisms, rather than the single mechanism, which must provide financial responsibility for an amount at least equal to the current cost estimate.		Not Applicable
146.85(b)(1)	The owner or operator must maintain financial responsibility and resources until:		Not Applicable

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(b)(1)(i)	The Director receives and approves the completed post-injection site care and site closure plan; and	5.205(b)(1) A person to whom a permit is issued under this subchapter must provide annually to the director evidence of financial responsibility that is satisfactory to the director. The owner or operator must demonstrate and maintain financial responsibility for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the director has provided written verification that the director has determined that the facility has reached the end of the post-injection storage facility care period.	Section 9.6 – Post-Injection Site Care and Site Closure Plan
146.85(b)(1)(ii)	The Director approves site closure.	5.205(b)(1) A person to whom a permit is issued under this subchapter must provide annually to the director evidence of financial responsibility that is satisfactory to the director. The owner or operator must demonstrate and maintain financial responsibility for corrective action, injection well plugging, post-injection storage facility care and storage facility closure, and emergency and remedial response until the director has provided written verification that the director has determined that the facility has reached the end of the post-injection storage facility care period.	Section 9.6.2 – Site Closure Plan

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(c)	The owner or operator must have a detailed written estimate, in current dollars, of the cost of performing corrective action on wells in the area of review, plugging the injection well(s), post-injection site care and site closure, and emergency and remedial response.	5.205(c)(2)(F)The owner or operator of a geologic storage facility must provide to the director, and the director must approve, annual written updates of the cost estimate to increase or decrease the cost estimate to account for any changes to the AOR and corrective action plan, the emergency response and remedial action plan, the injection well plugging plan, and the post-injection storage facility care and closure plan. The Director must approve any decrease or increase to the initial cost estimate. During the active life of the geologic storage project, the owner or operator must revise the cost estimate no later than 60 days after the director has approved the request to modify the AOR and corrective action plan, the injection well plugging plan, the post-injection storage facility care and closure plan, and the emergency and response plan, if a change in any of these plans increases the cost. If a change to a plan decreases the cost, any withdrawal of funds must be approved by the director. Any decrease to the value of a financial assurance instrument must first be approved by the director. The revised cost estimate must be adjusted for inflation as specified at paragraph (2)(E) of this subsection. The owner or operator must provide to the director, within 60 days of notification by the director, an adjustment of the cost estimate if the director determines	Section 9.6.2 – Site Closure Plan

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		during the annual evaluation of the qualifying financial responsibility instruments that the most recent demonstration is no longer adequate to cover the cost of corrective action, injection well plugging and post-injection storage facility care and closure, and emergency and remedial response.	
146.85(c)(1)	The cost estimate must be performed for each phase separately and must be based on the costs to the regulatory agency of hiring a third party to perform the required activities. A third party is a party who is not within the corporate structure of the owner or operator.	5.205(c)(2)(C)(ii) qualified professional engineer licensed by the State of Texas, as required under Occupations Code, Chapter 1001, relating to Texas Engineering Practice Act, must prepare or supervise the preparation of a written estimate of the highest likely amount necessary to close the geologic storage facility. The owner or operator must submit to the director the written estimate under seal of a qualified licensed professional engineer, as required under Occupations Code, Chapter 1001, relating to Texas Engineering Practice Act; and	Section 9.6.2 – Site Closure Plan
146.85(c)(2)	During the active life of the geologic sequestration project, the owner or operator must adjust the cost estimate for inflation within 60 days prior to the anniversary date of the establishment of the financial instrument(s) used to comply with paragraph (a) of this section and provide this adjustment to the Director. The owner or operator must also provide to the Director written updates of adjustments to the cost estimate within 60 days of any amendments to the area of	5.205(c)(2)(F)The owner or operator of a geologic storage facility must provide to the director, and the director must approve, annual written updates of the cost estimate to increase or decrease the cost estimate to account for any changes to the AOR and corrective action plan, the emergency response and remedial action plan, the injection well plugging plan, and the post-injection storage facility care and closure plan. The Director must approve any	Section 9.3 – Estimated Coverage Amounts

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	review and corrective action plan (146.84), the injection well plugging plan (146.92), the post-injection site care and site closure plan (146.93), and the emergency and remedial response plan (146.94).	decrease or increase to the initial cost estimate. During the active life of the geologic storage project, the owner or operator must revise the cost estimate no later than 60 days after the director has approved the request to modify the AOR and corrective action plan, the injection well plugging plan, the post-injection storage facility care and closure plan, and the emergency and response plan, if a change in any of these plans increases the cost. If a change to a plan decreases the cost, any withdrawal of funds must be approved by the director. Any decrease to the value of a financial assurance instrument must first be approved by the director. The revised cost estimate must be adjusted for inflation as specified at paragraph (2)(E) of this subsection. The owner or operator must provide to the director, within 60 days of notification by the director, an adjustment of the cost estimate if the director determines during the annual evaluation of the qualifying financial responsibility instruments that the most recent demonstration is no longer adequate to cover the cost of corrective action, injection well plugging and post-injection storage facility care and closure, and emergency and remedial response.	

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
146.85(c)(3)	The Director must approve any decrease or increase to the initial cost estimate. During the active life of the geologic sequestration project, the owner or operator must revise the cost estimate no later than 60 days after the Director has approved the request to modify the area of review and corrective action plan (146.84), the injection well plugging plan (146.92), the post-injection site care and site closure plan (146.93), and the emergency and response plan (146.94), if the change in the plan increases the cost. If the change to the plans decreases the cost, any withdrawal of funds must be approved by the Director. Any decrease to the value of the financial assurance instrument must first be approved by the Director. The revised cost estimate must be adjusted for inflation as specified at paragraph (c)(2) of this section.	5.205(c)(2)(F)The owner or operator of a geologic storage facility must provide to the director, and the director must approve, annual written updates of the cost estimate to increase or decrease the cost estimate to account for any changes to the AOR and corrective action plan, the emergency response and remedial action plan, the injection well plugging plan, and the post-injection storage facility care and closure plan. The Director must approve any decrease or increase to the initial cost estimate. During the active life of the geologic storage project, the owner or operator must revise the cost estimate no later than 60 days after the director has approved the request to modify the AOR and corrective action plan, the injection well plugging plan, the post-injection storage facility care and closure plan, and the emergency and response plan, if a change in any of these plans increases the cost. If a change to a plan decreases the cost, any withdrawal of funds must be approved by the director. Any decrease to the value of a financial assurance instrument must first be approved by the director. The revised cost estimate must be adjusted for inflation as specified at paragraph (2)(E) of this subsection. The owner or operator must provide to the director, within 60 days of notification by the director, an adjustment of the cost estimate if the director determines	Section 9.3 – Estimated Coverage Amounts

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		during the annual evaluation of the qualifying financial responsibility instruments that the most recent demonstration is no longer adequate to cover the cost of corrective action, injection well plugging and post-injection storage facility care and closure, and emergency and remedial response.	
146.85(c)(4)	Whenever the current cost estimate increases to an amount greater than the face amount of a financial instrument currently in use, the owner or operator, within 60 days after the increase, must either cause the face amount to be increased to an amount at least equal to the current cost estimate and submit evidence of such increase to the Director, or obtain other financial responsibility instruments to cover the increase. Whenever the current cost estimate decreases, the face amount of the financial assurance instrument may be reduced to the amount of the current cost estimate only after the owner or operator has received written approval from the Director.	5.205(c)(2)(G) Whenever the current cost estimate increases to an amount greater than the face amount of a financial instrument currently in use, the owner or operator, within 60 days after the increase, must either cause the face amount to be increased to an amount at least equal to the current cost estimate and submit evidence of such increase to the director or obtain other financial responsibility instruments to cover the increase. Whenever the current cost estimate decreases, the face amount of the financial assurance instrument may be reduced to the amount of the current cost estimate only after the operator has received written approval from the director.	Section 9.3 – Estimated Coverage Amounts
146.85(d)	The owner or operator must notify the Director by certified mail of adverse financial conditions such as bankruptcy that may affect the ability to carry out injection well plugging and post-injection site care and site closure.	5.205(d)(1)The owner or operator must notify the Commission of adverse financial conditions that may affect the owner's or operator's ability to carry out injection well plugging and post-injection storage facility care and closure. An owner or operator must file any notice of bankruptcy in accordance with 3.1(f) of this title (relating to Organization Report; Retention of Records;	Not Applicable

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
		Notice Requirements). The owner or operator must give such notice by certified mail.	
146.85(d)(1)	In the event that the owner or operator or the third party provider of a financial responsibility instrument is going through a bankruptcy, the owner or operator must notify the Director by certified mail of the commencement of a voluntary or involuntary proceeding under Title 11 (Bankruptcy), U.S. Code, naming the owner or operator as debtor, within 10 days after commencement of the proceeding.	5.205(d)(2) The owner or operator filing a bond must ensure that the bond provides a mechanism for the bond or surety company to give prompt notice to the Commission and the owner or operator of any action filed alleging insolvency or bankruptcy of the surety company or the bank or alleging any violation that would result in suspension or revocation of the surety or bank's charter or license to do business.	Not Applicable
146.85(d)(2)	A guarantor of a corporate guarantee must make such a notification to the Director if he/she is named as debtor, as required under the terms of the corporate guarantee.		Appendix J-2
146.85(e)	The owner or operator must provide an adjustment of the cost estimate to the Director within 60 days of notification by the Director, if the Director determines during the annual evaluation of the qualifying financial responsibility instrument(s) that the most recent demonstration is no longer adequate to cover the cost of corrective action (as required by 146.84), injection well plugging (as required by 146.92), post-injection site care and site closure (as	5.205(c)(2)(F)The owner or operator of a geologic storage facility must provide to the director, and the director must approve, annual written updates of the cost estimate to increase or decrease the cost estimate to account for any changes to the AOR and corrective action plan, the emergency response and remedial action plan, the injection well plugging plan, and the post-injection storage facility care and closure plan. The Director must approve any	Section 9.3 – Estimated Coverage Amount

EPA 40 CFR	EPA 40 CFR Description	Texas State Citation and Requirement	Corresponding Section
	required by 146.93), and emergency and remedial response (as required by 146.94).	decrease or increase to the initial cost estimate. During the active life of the geologic storage project, the owner or operator must revise the cost estimate no later than 60 days after the director has approved the request to modify the AOR and corrective action plan, the injection well plugging plan, the post-injection storage facility care and closure plan, and the emergency and response plan, if a change in any of these plans increases the cost. If a change to a plan decreases the cost, any withdrawal of funds must be approved by the director. Any decrease to the value of a financial assurance instrument must first be approved by the director. The revised cost estimate must be adjusted for inflation as specified at paragraph (2)(E) of this subsection. The owner or operator must provide to the director, within 60 days of notification by the director, an adjustment of the cost estimate if the director determines during the annual evaluation of the qualifying financial responsibility instruments that the most recent demonstration is no longer adequate to cover the cost of corrective action, injection well plugging and post-injection storage facility care and closure, and emergency and remedial response.	
146.85(f)	The Director must approve the use and length of pay-in-periods for trust funds or escrow accounts.		Not Applicable

Underground Injection Control – Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

SECTION 1 – INTRODUCTION

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage LLC

May 2025

SECTION 1 – INTRODUCTION

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Appendix A – Project Maps

Appendix A-1: Site Overview Map

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1.0 Introduction

ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) is submitting this Underground Injection Control (UIC) Class VI Permit Application (Application) to the U.S. Environmental Protection Agency (EPA) for the Rose Carbon Capture and Storage (CCS) Project (Project) in Jefferson County, Texas. The Project location is in the Houston Embayment of the Gulf Coast Basin, with well-documented formations for injection and containment of carbon dioxide (CO2). The CO2 is derived from relatively pure industrial sources, where industrial, atmospheric emission points under long-term contract will be captured and compressed for transportation to the Project area.

The Application was made in accordance with the requirements of the UIC Program for Carbon Dioxide Geologic Sequestration Wells promulgated in the Code of Federal Regulations, Title 40, Sections 146.81 through 146.95 [40 CFR 146.81–146.95]. As part of the Project, ExxonMobil drilled a stratigraphic well (Bead Farm Co. #1; American Petroleum Institute [API] 4224532908) and implemented a data acquisition program. The stratigraphic well (Bead Farm Co. #1) has since been converted to an above-zone monitoring well to conduct monitoring above the confining zone. This Application presents a refined level of understanding about the suitability of the Project site for sequestration of CO2 and how underground sources of drinking water (USDW) will be protected throughout the lifecycle of the Project.

The data acquisition program for the stratigraphic well produced a significant amount of site-specific information. Field observations were made of the core samples, geological logging data were collected through the injection and confining zones, injectivity testing yielded measurements of injection zone permeability, and numerous laboratory tests were performed on core and fluid samples for refining the site characterization and geochemical model. As a result, an Area of Review (AoR) model and injection strategy were developed and well designs made to align with the site characterization data. Sufficient geologic characterization data are available to model the AoR, optimize the operating parameters, and identify the risks and uncertainties of the Project. The potential for uncertainty that could result in USDW endangerment was addressed on a risk-by-risk basis in the operating strategy, injection well design, and the testing and monitoring program.

The following subsections and associated appendix provide the information required under 40 CFR 146.82(a) in a summary format. Please refer to the individual sections for the complete discussion of information and required points of evaluation. For ease of review and efficiency, the EPA's Geologic Sequestration Data Tool (GSDT) content tracking check boxes were used in this section to demonstrate compliance with the requirements on a topic-by-topic basis.

1.1 Injection Well Location and Area of Review

The Project is designed to collect, transport, and sequester a maximum of 5 million metric tonnes per annum (MMta) of CO2 using three injection wells. In total, ExxonMobil plans to sequester approximately 53 million metric tonnes of CO2 over a 13-year period. ExxonMobil has either secured legal rights or is in the process to secure legal rights to sequester CO2 in the AoR for the life of the Project. Agreements with landowners are in place with Bead Farm Co. and LaBelle Properties, Ltd., which hold the largest acreage position and have used the land for agricultural purposes for more than 75 years.

Table 1-1 provides the location of the three injection wells as required by 40 CFR 144.31(2). A map showing the injection wells for which the permits are sought, the applicable AoR, and the features present within the AoR is provided in Figure A-1 in Appendix A [40 CFR 146.82(a)(2)]. ExxonMobil identified no indications of the presence of tribal lands; archaeological and cultural sites; military installations; mines and quarries; critical habitats; state and federal clean-up sites; and springs. Figure A-1 shows water bodies, wetland features, structures for human occupancy, surface trace of faults, injection well locations, monitoring well locations, and identified artificial penetrations.

Table 1-1: Proposed Injection Well Locations

Well Name and Number	API	Location	Latitude (NAD83)	Longitude (NAD83)
LaBelle Properties Ltd #1 (Rose CCS Project Injection Well No. 01)	4224532913	RRC District 3, Section 42, Abstract 874	29° 59' 58.84" 29.999678	-94° 17' 6.39" -94.285108
Bead Farm Co. #2 (Rose CCS Project Injection Well No. 02)	4224532911	RRC District 3, Section 41, Abstract 266	29° 59' 27.66" 29.991017	-94° 17' 52.93" -94.298036
Bead Farm #3 (Rose CCS Project Injection Well No. 03)	4224532912	RRC District 3, Section 8, Abstract 658	30° 00' 42.40" 30.011778	-94° 17' 52.29" -94.297858
RRC = Railroad Commission of Texas				

1.2 Contact Information

Pursuant to 40 CFR 144.31(e)(4), the name and mailing address for the operator as summarized below.

ExxonMobil Low Carbon Solutions Onshore Storage LLC
22777 Springwoods Village Parkway
Spring, TX 77389

Facility contacts:

Claimed as PBI [redacted]

Pursuant to 40 CFR 146.82(a)(20), contact information related to the Project is outlined below. Table 1-2 summarizes key contact information for local, state, and federal agencies. This Project is not located on federal, state, or Indian lands.

Table 1-2: Local, State, and Federal Contact Information

Agency	Telephone Number
Beaumont Fire and Rescue Station 1	911 or (409) 880-3901
Jefferson County Sheriff	911 or (409) 835-8411

Agency	Telephone Number
Jefferson County Public Health Unit #1	(409) 835-8530
Jefferson County Office of Emergency Management	(409) 835-8757
Jefferson County Emergency Service District No 3	911 or (409) 735-2419
Texas Division of Emergency Management	(512) 424-2208
Texas Department of Public Safety	(512) 424-2000
State of Texas Spill-Reporting Hotline	(800) 832-8224
Texas Parks and Wildlife Department	(512) 389-4800
EPA Region 6	(800) 887-6063 or (214) 665-2760
Class VI Contact—Brandon Maples	(214) 665-7252
Texas Department of Natural Resources	(512) 389-4800
Jefferson County Local Emergency Planning Committee	(409) 835-8757
National Response Center	(800) 424-8802
State of Texas Spill-Reporting Hotline	(800) 832-8224
EPA National Response Center (24 hours)	(800) 424-8802

ExxonMobil Low Carbon Solutions Onshore Storage LLC is a public entity. Pursuant to 40 CFR 144.31(e)(3), the Project is operating under Standard Industrial Classification Code 4953 - Refuse Systems (nonhazardous waste disposal sites).

GSDT Submission - Project Background and Contact Information

GSDT Module: Project Information Tracking

Tab(s): General Information tab; Facility Information and Owner/Operator Information tab

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

☒ Required project and facility details ***[40 CFR 146.82(a)(1)]***

1.3 Site Characterization

Section 2 – Site Characterization provides a detailed set of narratives, tables, figures, and supporting material to fulfill the site characterization requirements listed at 40 CFR 146.82(a)(2), (3), (5), and (6). The purpose of this subsection is to provide a cursory review of the information provided in Section 2 with particular attention to the site characteristics that demonstrate site suitability for CO2 sequestration and protection of USDWs.

1.3.1 Objectives

The primary objectives of the site characterization were to gather available information, evaluate a variety of data (e.g., seismic and well logs), and assemble the required maps and cross sections of the AoR that show formation depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of the injection and confining zones. Attention was given to key features (e.g., faults) that could impact CO2 containment. The potential for USDW endangerment was assessed by identifying and evaluating scenarios for fluid migration through the confining zone toward the USDWs. A discussion of seismic history and the potential for

induced seismicity is included along with the geochemical assessment of potential reactions between the CO2 plume and the mineralogy of the injection and confining zones.

1.3.2 Approach

The site characterization was initially developed for the Application using published public and private information. Seismic surveys and legacy well logs were analyzed including spontaneous potential, gamma ray, resistivity, bulk density, and sonic logs. Maps and cross-sections were presented to clearly show the lithologies and depths of the injection and confining zones and to illustrate regional structural features. In November 2023, ExxonMobil completed the stratigraphic well that provided additional site-specific information on the geology, rock properties, hydrogeology, and geochemistry.

The integrated geologic model developed for the Project site was developed using the site-specific data. Overall, the results of the stratigraphic well data evaluation (e.g., structural, depositional, petrophysical analysis) agree with the existing geologic model. The model provides a three-dimensional representation of the injection and confining zones for subsequent simulation of CO2 plume and pressure-front migration. Confidence in the geologic model was gained from the apparent continuity and consistency of the stratigraphic well data with the model. The model covers over 115,000 acres and extends beyond the predicted plume and AoR boundaries. The revised geologic model incorporates site-specific and regional core, log, and seismic data to characterize the structural configuration; facies and lithological property distribution; and porosity-permeability relationships and distribution, among other data.

1.3.3 Summary of Site Suitability

The Project area is suitable for CO2 injection and containment into the proposed injection intervals of the Fleming and Upper Frio Formations. Through the stratigraphic well data collection program, the sands of the Fleming and Upper Frio Formations were found to exhibit high porosity and permeability resulting in sufficient potential for CO2 storability. The injection intervals are “of sufficient areal extent, thickness porosity and permeability to receive the total anticipated volume of the carbon dioxide stream” [40 CFR 146.83(a)(1)]. Sufficient geologic characterization data are available to model the AoR and optimize the operating parameters as well as identify the risks and uncertainties of the Project. This high level of understanding served as the basis for setting the operating conditions for CO2 sequestration, creating a plan to satisfy the pre-operational testing requirements for the overall Application, and designing the testing and monitoring plan for the Project.

The upper composite confining zone (UCCZ) is located above the Fleming Sands and is the top seal overlying the injection zone. The Anahuac Shale is located between the Fleming sands and the Upper Frio sands. Both sealing layers are thick and continuous across the AoR and are sufficient to “contain the injected carbon dioxide stream and displaced formation fluids and allow injection at proposed maximum pressure and volumes without initiating or propagating fractures in the confining zone” [40 CFR 146.83(a)(2)]. The top and bottom elevations of the injection intervals and confining zones were assessed using the stratigraphic well data and show the lateral continuity and substantial thickness within the AoR.

As shown in Figure B-12 of Appendix B, the UCCZ above the injection zone is a thick, muddy Lower Miocene interval that includes the Amphistegina “B” shale (described in Section 2). Total interval thickness ranges from approximately 360 to 490 ft near the injection wells. The top of the UCCZ was contacted at 2,981 ft Kelly Bushing at the stratigraphic well and projected to be contacted at an average depth of 3,043 ft Kelly Bushing at the injection well locations. This depth (top of the UCCZ) is approximately 1,500 ft below the lowermost USDW in the vicinity of the injection wells, providing significant vertical separation between the first water-bearing zone above the UCCZ and lowermost USDW. The USDWs are associated with the Chicot and the uppermost portion of Evangeline Aquifers, which are utilized for potable water in the region.

The Project is envisioned to inject CO2 into well-defined and characterized geologic formations of the Gulf Coast Basin deemed ideal for CO2 sequestrations purposes:

- The proposed injection zone extends from the top of the Fleming sands immediately below the UCCZ to the base of the Upper Frio Formation (Frio Sand 1 and Frio Sand 2) sands;
- Three injection intervals utilize the Fleming sands (Fleming Sand 1, Fleming Sand 2, Fleming Sand 3), which are thick and continuous with a net sand thickness of approximately 780 to 1,780 feet (ft), are separated by interbedded shales, and each exhibits an estimated average porosity of [redacted] porosity and an average permeability of [redacted] millidarcies at the three proposed injection well locations; and
- Two sands in the Upper Frio are combined into a single injection interval offering a total net sand thickness of approximately 560 ft to 1,040 ft with an average estimated porosity of [redacted] and an average permeability of [redacted] millidarcies at the three proposed injection well locations.


Claimed as PBI

In addition, the Anahuac Shale overlies the Upper Frio Formation and offers additional confining characteristics for the Upper Frio injection interval. The Anahuac Shale is a thick and continuous shale bed in the region, including the AoR. It is easily identified by its distinct log and seismic character, and it was readily apparent in the core samples from the stratigraphic well. The Anahuac Shale was measured to be 409 ft thick at the stratigraphic well and is estimated to be an average of 392 feet thick at the three injection wells. The lower confining zone is an interval of shale that is several thousand feet thick, located below the base of the Frio injection zone. The lower confining zone is often below the total depth of most of the exploration wells in the Project area.

Four faults were identified within the AoR, but only one extends to the UCCZ. Figure B-53a (from Section 2 – Site Characterization) illustrates the modeled structural grid cross section from east to west through one of the planned injection wells, the stratigraphic well, and Broussard Trust-1 legacy well. This figure illustrates the modeled relationships of the injection intervals, the confining zones, and faults. These faults do not exhibit significant transmissive potential for CO2 or formation fluids, and only one of the faults was identified as having a minimal offset in the UCCZ. Figure B-53a shows that the model identified no significant offset between the Fleming sands and no significant faults that could reduce the confining properties of the UCCZ. A fault-sealing analysis was conducted and the results indicated that fault sealing is likely to occur based on the fault gouge ratio and other factors. Fault sealing is another line of evidence supporting the containment features of the injection and confining zones.

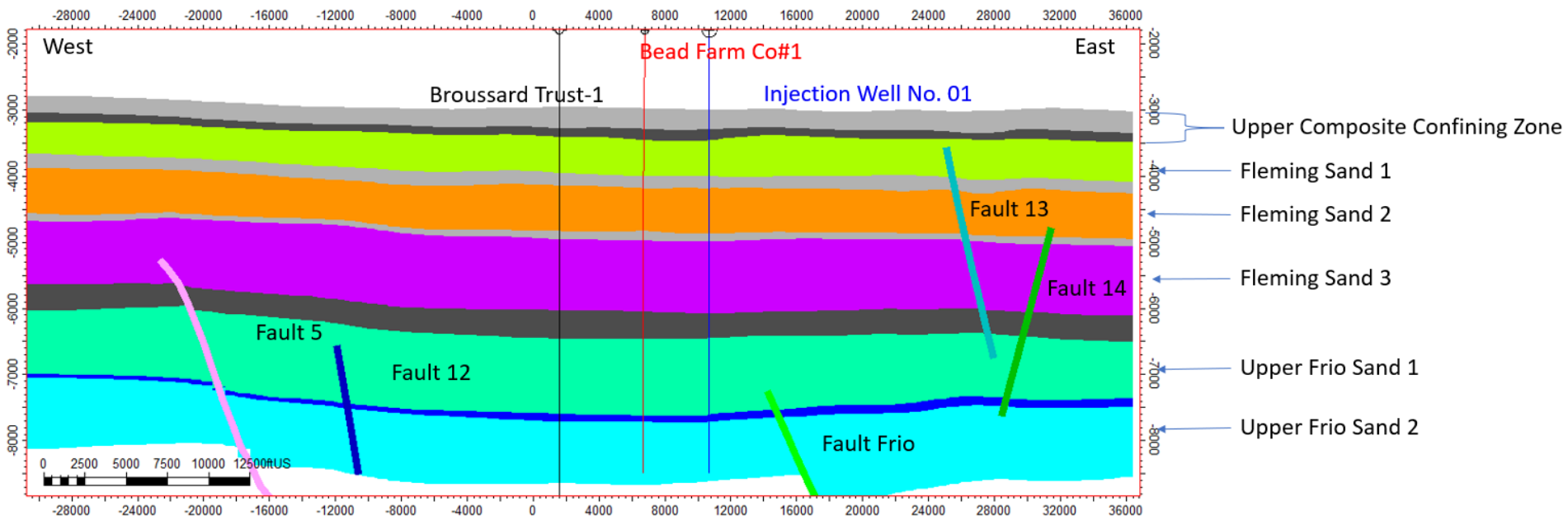
The chemical and physical characteristics of the CO2 stream were found to be compatible (e.g., no significant dissolution or precipitation is expected) with the geochemical conditions in the injection intervals and confining zones. Site-specific reaction scenarios were considered using the mineralogy fluid samples collected from the stratigraphic well. The modeled mineralogy and brine geochemistry captured the major geochemical factors that could cause changes in porosity and/or mobilize naturally occurring metals. The results of the scenario modeling showed that the expected variations in the mineralogy of the confining and injection zones would not generate significant mineral precipitation or dissolution, with no apparent impact on the pore space or confinement properties for the Project.

1.4 AoR and Corrective Action Plan

1.4.1 AoR

Two rounds of comprehensive modeling and evaluation efforts were undertaken to assess the CO2 plume and brine pressure-front boundaries. Through this detailed and comprehensive modeling effort, the approach to delineating the AoR was described, the basis and rationale for selection of the input parameters for the model was explained, and the strategies for corrective action for the artificial penetrations within AoR were proposed. The model incorporated the permeability and porosity of the injection zone gathered from the stratigraphic well, which was higher than originally estimated from regional and local data. This site-specific data was incorporated into the injection strategy. With less pressure buildup during injection in the injection zone and rapid pressure declines after injection ceases, the potential for CO2 or brine fluid migration to occur between the injection zone and groundwater above the UCCZ is less probable than originally projected.

The Application provides the full-model data to support EPA's evaluation of the AoR delineation. Figure 3-11 (reproduced from Section 3 – Area of Review and Corrective Action Plan) provides an illustration of the extent of the geologic model boundary, the simulation model boundary for evaluation of migration, and certain geologic features of interest.



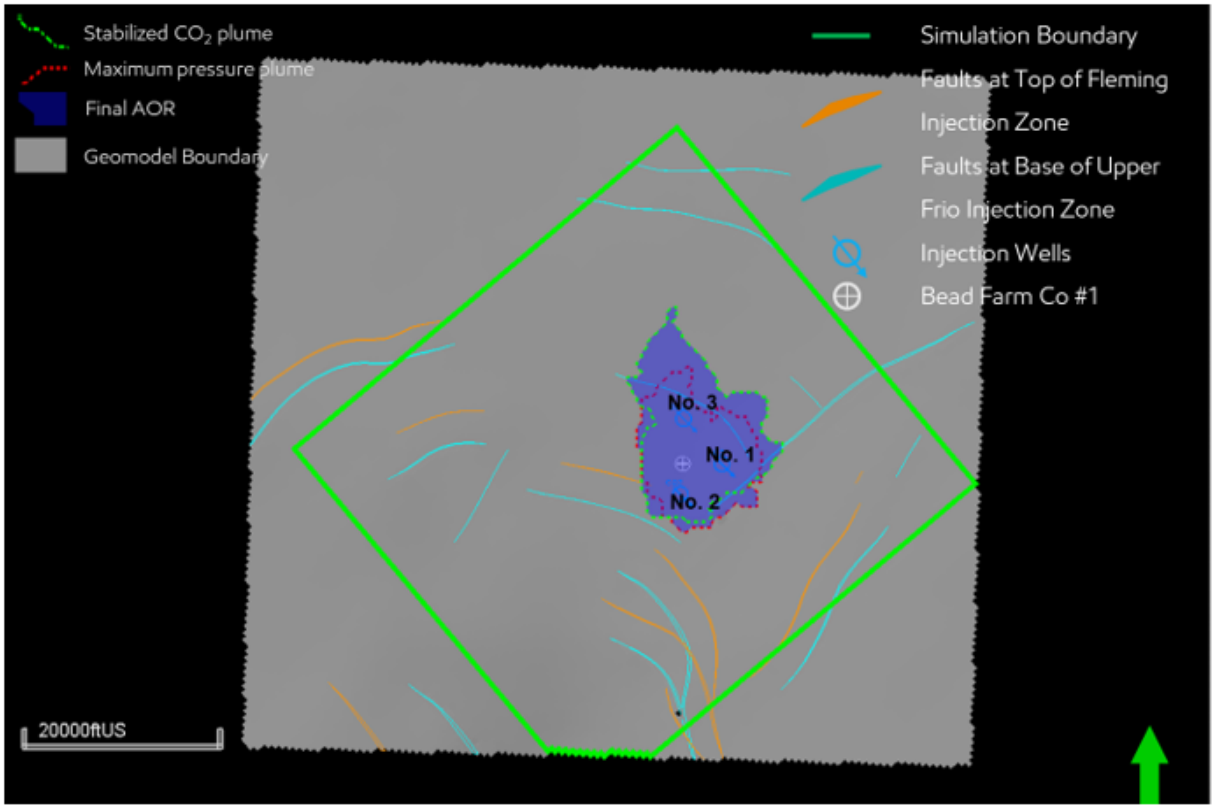
Symbol legend

- Upper Composite Confining Zone
- Fleming 1 Injection Zone
- Intra-Fleming Shale 1
- Fleming 2 Injection Zone
- Intra-Fleming Shale 2
- Fleming 3 Injection Zone
- Anahuac Seal
- Frio 1 Injection Zone
- Intra-Frio Shale 1
- Frio 2 Injection Zone
- Injector Well #1
- Broussard Trust - 1
- Bead Farm Co - 1

Figure B-53a
Model Structural Grid Cross Section (West-East)
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

Figure 3-11: Extent of Simulation Boundary, AoR, and Geologic Fetures in the Model Domain



Selected input parameter values from the stratigraphic well data, aligned with local and regional data, include:

- Maximum bottomhole pressures ranging from 2,053 pounds per square inch (psi) in the Fleming Sand 1 to 4,670 psi in the Frio Sand 1;
- The maximum bottomhole injection pressure is below 90% of the fracture pressure based on calculated fracture gradients of Claimed as PBI for the Fleming Sands and Claimed as PBI for the Upper Frio Sands;
- The resulting critical pressure rise for the Fleming Sand 1, the uppermost injection interval closest to the UCCZ, was estimated to be Claimed as PBI for two of the injection wells and Claimed as PBI for the third injection well; and
- The critical pressure rise value provides protection of the lowermost USDW and will be used in the operating strategy for the Project.

The operational and geologic input parameters were used in the Eclipse™ model to generate projections of plume and pressure versus time.

ExxonMobil is proposing a seven-stage injection sequencing program within the four injection intervals to optimize CO2 storage and manage CO2 plume migration across the life of the Project. The injection phase is planned to be 13 years, after which time the rate of plume size

growth is expected to diminish rapidly. The maximum areal extent of the CO_2 plume follows the structural dip to the northwest. Figure 3-17 (reproduced from Section 3 – Area of Review and Corrective Action Plan) Claimed as PBI [redacted]

Figure 3-17: Model Areal Plume Size, Growth Rate, and Stabilization

[redacted]

1.4.2 Correction Action Plan

The comprehensive search of public and private databases conducted for the Application was relied upon for identifying the artificial penetrations within the AoR that warranted correction action. The basis for the evaluation of artificial penetrations was an aeromagnetic survey and field reconnaissance of the acreage position for the AoR. The size of the AoR resulted in a evaluation that phased corrective action is not necessary for the Project.

A total of 21 artificial penetrations were identified within the AoR, of which five are project injection wells or monitoring wells that penetrate the UCCZ, and one is a legacy well that also penetrates the UCCZ. ExxonMobil developed a Corrective Action Plan for the artificial penetration that was identified with plugging deficiencies and to have the potential to act as a vertical conduit because the well was completed as an open borehole (Broussard JE Jr-1 API: 4224502193).

Of the Project wells penetrating the UCCZ, one was the Project's stratigraphic well (Bead Farm Co. #1), which has been converted to an above-zone monitoring well. The other Project related wells are the three injection wells and the in-zone monitoring well.

The Broussard JE Jr-1 legacy well has been appropriately remediated prior to operations. Further details can be found in Section 3 – Area of Review and Corrective Action.

AoR and Corrective Action GSDT Submissions

GSDT Module: AoR and Corrective Action

Tab(s): All applicable tabs

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

☒ Tabulation of all wells within AoR that penetrate confining zone ***[40 CFR 146.82(a)(4)]***

☒ AoR and Corrective Action Plan ***[40 CFR 146.82(a)(13) and 146.84(b)]***

☒ Computational modeling details ***[40 CFR 146.84l]***

1.5 Financial Responsibility

Under 40 CFR 146.85, owners or operators of geologic sequestration (GS) injection wells are required to demonstrate financial responsibility for GS activities. Consistent with these regulatory requirements, ExxonMobil has prepared the necessary documentation to demonstrate financial responsibility for the injection wells that comprise the Project. Each of the required Project activities has been considered for the financial assessment and the estimated financial assurance coverage value is $23,631,000 including estimated costs for each of the GS activities: corrective action ($0), well plugging ($3,603,000), post-injection site care and site closure ($11,420,000), and emergency and remedial response ($8,608,000). Each of the financial coverage / threshold requirement per 40 CFR146.85(a)(6)(v) were met by ExxonMobil. In addition, the required documentation of the company's ability to meet the requisite financial coverage and threshold criteria was provided and the financial instruments will be updated and verified no less than annually. ExxonMobil will confirm that the coverage limits provided by the respective financial responsibility instruments are sufficient to cover the corresponding costs prior to initiating each major Project phase.

Financial Responsibility GSDT Submissions

GSDT Module: Financial Responsibility Demonstration

Tab(s): Cost Estimate tab and all applicable financial instrument tabs

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

☒ Demonstration of financial responsibility ***[40 CFR 146.82(a)(14) and 146.85]***

1.6 Injection Well Construction

Section 4 – Well Construction Plan and Operating Conditions provides details regarding the injection well construction design, casing design details, and testing plan for the three CO2 injection wells for the Project. Injection well construction was designed to resist corrosion and provide a seal at the UCCZ that is compatible with the CO2 stream [40 CFR 146.86(b)]. The completion depths were evaluated based on the stratigraphic data collected at the stratigraphic well and the casing materials were aligned with EPA's communication on this topic, dated June 25, 2024. See *Class VI Well Construction – Concerns with Casing Metallurgy – DO NOT REPLY* email from Maples, B., Phys. Scientist, Ground Water/UIC Section, U.S. Environmental Protection Agency, Region 6 to Class VI Applicants and Potential Applicants (June 25, 2024) (Metallurgy Communication). Alignment with the Metallurgy Communication should address any EPA concerns regarding the integrity of specific metallurgy for the production casing and the tubing.

ExxonMobil plans to inject a maximum volume of 5 MMta for all three injection wells, which is an approximate rate of 264 million standard cubic feet per day at standard conditions. The tubing design, including size, weight, grade, properties of the injectate, rate of injection, and injection pressures evaluated by the detailed reservoir modeling.

The production casing utilizes a combination of 9-5/8-inch (in.) L-80, 13Cr-80, and 25Cr-125. In accordance with the Metallurgy Communication, 25Cr casing has been utilized and installed across the entirety of the permitted upper confining zone. Additionally, 25Cr casing has been installed at intra-permitted injection zone shale boundaries which correspond to notional packer placement depths and provide further redundancy. 13Cr has been utilized across all perforated intervals. The production tubing is 7-in. 13Cr-80, installed with an injection packer. This design uses 13Cr material in all sections where the CO2 will contact the tubulars. Data was collected during the construction process to assess the pre-operational conditions and align the well construction and operating strategy with site-specific results, as needed.

Injection will start at the injection interval shown on the injection sequencing plan in Section 3 – Area of Review and Corrective Action Plan. Once the target injection volume of CO2 is attained, that injection interval will be plugged back to isolate that interval from subsequent injections intervals. The next injection interval will then be accessed through additional perforations to establish communication with the reservoir. CO2 will continue into that new injection interval until the target CO2 storage amount has been achieved for that interval.

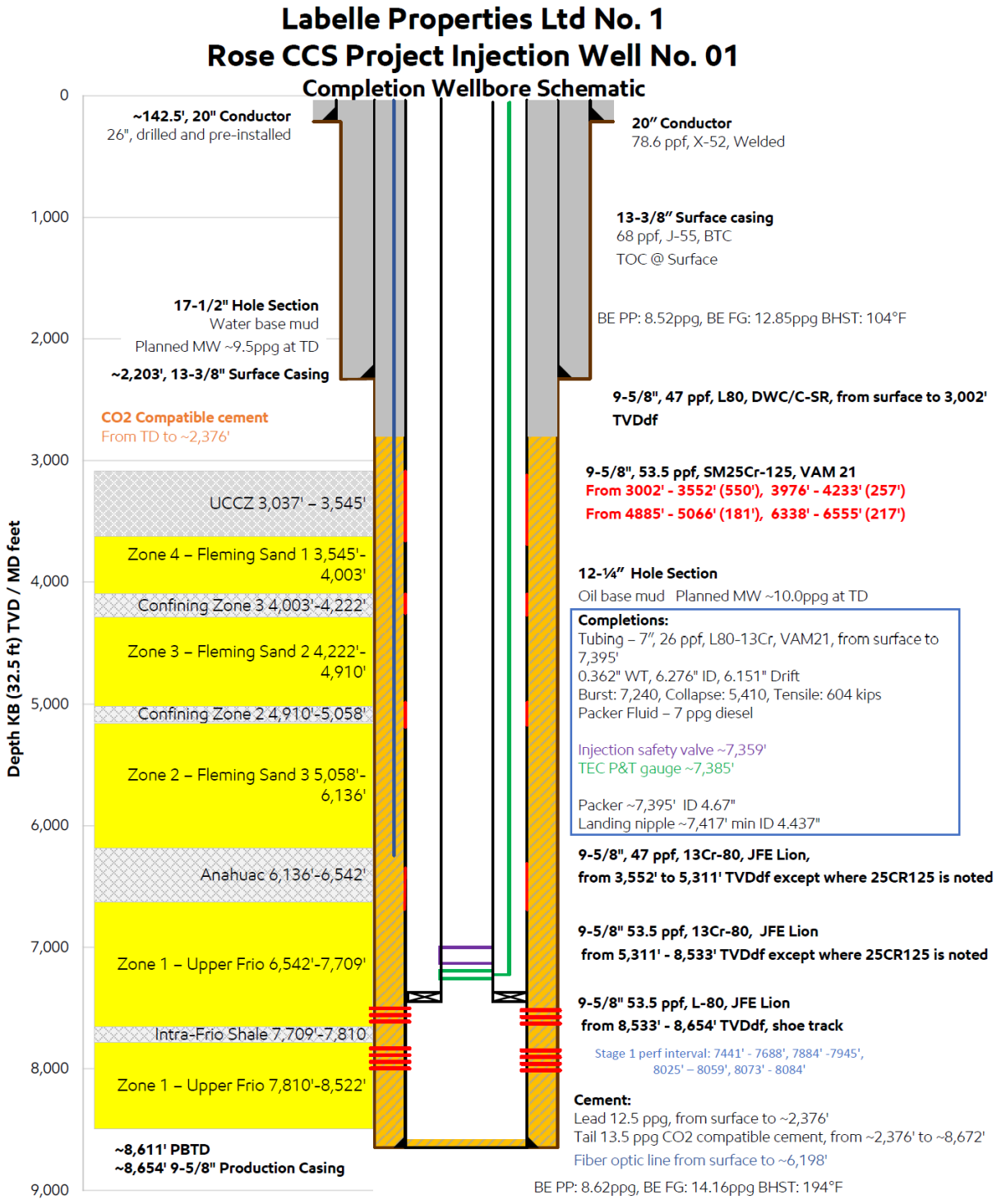
The following illustration provided in Appendix D (reproduced from Section 4 – Well Completion Plan and Operating Conditions) illustrates the well completion for Rose CCS Project Injection Well No. 1.

ExxonMobil has extensive experience designing, building, and operating wells throughout the world. The three injection wells (Rose CCS Project Injection Wells No. 01, No. 02, and No. 03) are designed for the injection and storage of CO2 safely in the Upper Frio and Fleming Sand injection intervals at the Project site, and to contain the CO2 within the injection intervals to protect USDWs.

ExxonMobil may perform a stimulation treatment of the injection zone in accordance with 40 CFR 146.82(a)(9). The detailed stimulation plan is included in Appendix D.

1.7 Well Pre-Operational Testing Plan

Section 4 – Well Construction Plan and Operating Conditions provides details on the pre-operational testing plan in accordance with 40 CFR 146.82(a)(8) and 146.87 for the injection wells. Given the comprehensive data collection and analysis program conducted at the stratigraphic well, the pre-operational testing plan for the injection wells was aligned to meet the specific requirements for compliance. The scope of the pre-operational testing plan included geophysical and core data collection in the stratigraphic well, fluid sampling at target intervals, and pressure testing to assess the injection intervals. Certain verification and logging data was collected at the injection wells as needed for the site characterization, plume model, and AoR determination. The Testing and Monitoring Plan (Section 5 – Testing and Monitoring Plan) provides the data collection activities for the pre-operational phase and the operational phase of the Project. A summary of that discussion is provided in Section 1.9 below for ease of review, with reference to the complete discussion in Section 5 for the pre-operational testing plan.



Appendix D.1: Completions Wellbore Schematic for Rose CCS Project Injection Well No. 01

Pre-Operational Logging and Testing GSDT Submissions

GSDT Module: Pre-Operational Testing

Tab(s): Welcome tab

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

☒ Proposed pre-operational testing program ***[40 CFR 146.82(a)(8) and 146.87]***

1.8 Operating Conditions

Section 4 – Well Construction Plan and Operating Conditions provides the plan for continuous injection and annulus monitoring systems for each injection well to help control injection pressure and trigger automatic shut-off devices and safety valves for CO2 injection, consistent with safe operating procedures. The proposed continuous monitoring and recording devices will be used to demonstrate internal mechanical integrity. The injection wells will be equipped with shutoffs and safety devices that are linked to operating limits specified in the permit for each injection well.

Of the engineering design features considered, one of the most critical aspects is the staged recompletion of each injection well to target injection into specific injection intervals to achieve the target CO2 storage amount. ExxonMobil plans to inject a maximum volume of 1.67 MMta into each of the injection wells. The maximum injection rates for the injection intervals of each well ranges from 1.1 to 1.67 MMta. The average injection rates are predicted to be a similar range because migration within the AoR is the critical factor, not pressure. Both the maximum and average injection rates are predicted to result in maximum reservoir pressure rises that are below 90% of the fracture pressure for the lifetime of the Project. Both injection rates and pressures are within the operating window of the injection wells. The Project will be operated within these parameters to reduce the potential migration of fluids from the injection zones to USDWs.

The carbon dioxide to be sequestered comes from high-concentration industrial sources including clean hydrogen, ammonia, direct reduced iron plants, and natural gas treatment facilities that feed into ExxonMobil's Gulf Coast CO2 pipeline network. The pipeline network maintains a CO2 composition of >97% carbon dioxide, <1% hydrogen and <3% methane. The pipeline network maintains a CO2 specification that was leveraged for design throughout the Application. As required in the Testing and Monitoring Plan, the composition of the CO2 will be monitored during the operational life of the Project to confirm that the chemical composition and physical characteristics of the injectate are consistent with the well design standards and operating conditions of the Class VI permits.

In general, interactions among the CO2 injectate and the reservoir fluids are not expected to reduce the permeability, porosity, or injectivity of CO2 into the injection intervals over the life of Project. Specific mineralogy and fluid testing were performed on core and fluid samples from the stratigraphic well that confirmed these conditions. As outlined in Section 4, the engineering

design basis included corrosion-resistant well completion materials aligned with EPA directives and best engineering practices to provide a high degree of mechanical integrity under future conditions for the formation fluids and CO2 plume.

Section 5 – Testing and Monitoring Plan provides a description of the analyses of the CO2 stream for the Projects, including tests for potential impurities that may be present and whether such impurities might alter the corrosivity of the injectate down-hole. The information provided in Section 5 was based on the expected chemical and physical characteristics of the CO2 stream and will be used to optimize operating parameters and comply with the UIC Class VI Rules.

1.9 Testing and Monitoring

Consistent with the requirements of 40 CFR 146.90, ExxonMobil developed a comprehensive Testing and Monitoring Plan for the Project using a risk-based approach. In-Zone Monitoring Well 01 was constructed during the pre-operational phase, USDW Monitoring Wells No.1, No.2, and No.3 were installed, and the stratigraphic well (Bead Farm Co #1) was converted to an above-zone monitoring well. Surface seismic surveys are planned for indirect CO2 plume tracking in lieu of distributed acoustic sensing vertical seismic profile. The locations of the monitoring wells were selected to gather data in alignment with the projected CO2 plume and pressure front tracking.

The Testing and Monitoring Plan was structured to use site characterization data and the plume and pressure-front modeling to identify migration pathways and areas for potential concern, identify how potential leakage pathways and uncertainties in the confining zone and injection zone could affect the AoR boundaries; and select specific testing and monitoring strategies and technologies that are tailored to the site-specific risk factors associated with plume and pressure-front migration.

The following hypothetical scenarios were considered appropriate for identifying the scope of the testing and monitoring strategy:

- Migration of CO2/brine along a fault/fault material or natural fracture impacting USDW;
- Migration of CO2/brine along a fault/fault material or natural fracture impacting USDW due to fault reactivation;
- CO2/brine leaks up an unknown wellbore or one inadequately remediated;
- Induced seismicity;
- Loss of external mechanical integrity, which leads to a release of CO2 from injection wells;
- CO2/brine leaks through seal(s) due to lack of seal continuity/presence;
- Unanticipated structural or stratigraphic baffling creates preferential CO2 plume migration pathways; and
- CO2 composition changes and creates excess injection corrosion or unexpected chemical reactions in the injection zone.

The maximum anticipated risk level is defined in the Application to be medium and is associated with the uncertainties in site characterization and AoR delineation.

The testing and monitoring data collection strategy includes injectate monitoring, corrosion monitoring of the well tubular, internal and external mechanical integrity tests, pressure fall-off testing, seismic profiling, well logging, continuous monitoring of injection rate and pressure, groundwater quality monitoring, direct and indirect CO2 plume tracking, and pressure-front tracking. CO2 plume and pressure-front tracking is of high importance. For the initial period of operation, the rate and direction of CO2 plume migration will be based on continuously recorded pressures and temperatures at the three injection wells and the in-zone monitoring well. Additionally, a baseline seismic survey will be used to establish the pre-operational seismic profile. ExxonMobil will also be evaluating emergent technologies for potential application to support plume monitoring throughout the life cycle of the Project.

The groundwater and CO2 samples will be analyzed for the suite of constituents and parameters identified for the CO2 stream, formation fluids, and mineralogy of the injection intervals. The frequency of sampling, including baseline sampling is proposed to start on a quarterly basis and then convert to an annual basis thereafter.

The data generated from implementation of this plan provides the basis to verify the confinement of the injectate in the permitted injection formations during the active injection phase of the Project.

ExxonMobil intends to review the data collection process throughout the life of the Project. An adaptive approach will be employed with respect to monitoring frequency of select parameters, whereby monitoring may be decreased based on positive test results. Monitoring results will be presented in semi-annual reports, wherein data will be evaluated, and any monitoring frequency modification would be justified. A defined schedule is proposed to address situations where there is a change in the AoR or other circumstances change, while adding little burden if the AoR reevaluation confirms that the Plan is appropriate as written. In this way, testing and monitoring results that indicate corrective action is required trigger the mitigation measures identified in the AoR reevaluation and the Emergency and Remedial Response Plan (ERRP) if needed, will be triggered at the appropriate time.

The Testing and Monitoring Plan will be reviewed and potentially revised at a minimum of every five years to:

- Identify Project-specific factors that warrant revision to the Plan;
- Incorporate information and changes necessary to monitor an increase in risk to or endangerment of USDWs; and/or
- Incorporate confirmed deviations from permitted conditions that require Plan modifications.

ExxonMobil will incorporate the collected monitoring data that characterizes the Project-specific factors and any changes needed to monitor increased potential risk to USDW and overall Plan compliance with the UIC Program Director’s requirements. Plan Amendments will be submitted within one year of an AoR reevaluation, following significant facility changes (such as the development of offset monitoring wells or newly-permitted injection wells within the AoR), or as the UIC Program Director requires.

Testing and Monitoring GSDT Submissions

GSDT Module: Project Plan Submissions

Tab(s): Testing and Monitoring tab

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

☒ Testing and Monitoring Plan ***[40 CFR 146.82(a)(15) and 146.90]***

1.10 Injection Well Plugging

Section 6 – Injection Well Plugging Plan (Plugging Plan) was prepared to describe the actions that ExxonMobil will take to mitigate potential threats to USDWs during the post-injection period. ExxonMobil has selected materials for plugging the injection wells that are compatible with corrosive properties of the injection fluid and help to maintain mechanical integrity of the plug and well casing.

The planned plugging procedures are aligned with best practices for restoring the UCCZ integrity at each injection well location. These procedures include flushing the injection wells with buffer fluid, removal of well components and obstructions (if any), conducting mechanical integrity tests, as needed, confirming the adequacy of CO2 compatible materials for use in setting cement plugs, and setting the plugs at the specific intervals. The detailed procedures for injection well plugging and abandonment are described in Section 6.

As described above, the staged perforation schedule for the injection wells results in multiple injection well “plug-back” events using well completion procedures to move from one injection interval to the next prior to permanent well closure. Once the storage capacity has been reached, the last injection interval and the remainder of the injection well will be plugged for final abandonment and the well location restored.

Injection Well Plugging GSDT Submissions

GSDT Module: Project Plan Submissions

Tab(s): Injection Well Plugging tab

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

☒ Injection Well Plugging Plan ***[40 CFR 146.82(a)(16) and 146.92(b)]***

1.11 Post-Injection Site Care and Site Closure

Section 7 – Post-Injection Site Care (PISC) and Site Closure Plan describes the activities that will occur once injection operations have ceased, and the Project moves into maintaining a non-endangerment condition for USDWs.

ExxonMobil's strategy for PISC monitoring is based on the same systems and processes as described in Section 5 – Testing and Monitoring Plan of this Application. The major monitoring elements include continued measurements of the CO2 plume and pressure-front location, monitoring above the UCCZ groundwater as well as USDWs. The data collected from this activity will be used to confirm compliance with the water quality objectives for the Project and generate information needed to support the final non-endangerment demonstration and subsequent site closure.

ExxonMobil also identified the potential for a surface seismic event to occur several years after injection ceases to evaluate the extent of the CO2 plume for plume tracking and model calibration. This event is considered a contingent event, to be based on the outcomes of several AoR review cycles with EPA and the RRC, because the reservoir pressures rapidly decline after injection ceases and the model will be calibrated to the AoR delineation measured at the end of injection in the Fleming Sand 1.

ExxonMobil will not cease post-injection monitoring until the non-endangerment demonstration has been approved by the UIC Program Director. The default PISC monitoring timeframe is 50 years after cessation of injection. ExxonMobil will monitor groundwater quality and track the position of the CO2 plume and pressure front for 50 years after cessation of injection unless a lesser period is approved by the UIC Program Director. At the time of this Application, an alternate timeframe has not been proposed for PISC monitoring. The end of the Project comes when the closure activities have been documented and approved by the UIC Program Director.

The Site Closure Plan will be implemented once ExxonMobil demonstrates to the UIC Program Director that no additional monitoring is required to demonstrate protection of USDW and that the testing and monitoring system can be dismantled. The objective of the plan is to demonstrate the differential between the pre-injection and predicted CO2 plume and pressure; outline the post-injection monitoring program; identify the steps for bringing the site to closure; and outline the recordkeeping practices.

The CO2 plume is expected to stabilize within 26 years of cessation of injection. ExxonMobil will utilize the data gathered throughout the life of the Project to update and maintain the PISC and Site Closure Plan with concurrent approval from the UIC Program Director. The intent of these updates and maintenance of the plan is to reduce the potential for migration of fluids from the injection zone to USDWs or the surface.

PISC and Site Closure GSDT Submissions
GSDT Module: Project Plan Submissions ***Tab(s):*** PISC and Site Closure tab Please use the checkbox(es) to verify the following information was submitted to the GSDT: ☒ PISC and Site Closure Plan ***[40 CFR 146.82(a)(17) and 146.93(a)]***
GSDT Module: Alternative PISC Timeframe Demonstration ***Tab(s):*** All tabs (only if an alternative PISC timeframe is requested) Please use the checkbox(es) to verify the following information was submitted to the GSDT: ☐ Alternative PISC timeframe demonstration ***[40 CFR 146.82(a)(18) and 146.93(c)]***

1.12 Emergency and Remedial Response

Section 8 – Emergency and Remedial Response Plan describes the actions that the Project will undertake to immediately address an event where the movement of the injection fluid or formation fluid endangers an USDW during the construction, operation, or PISC periods of the Project. The purpose of this section is to provide the elements of the risk management process undertaken for the Project so that the UIC Program Manager can ultimately approve the remedial and response actions in advance. Once approved, ExxonMobil will be prepared to implement the actions necessary to facilitate and expedite response efforts for the occurrence of a leak from the injection zone.

The objectives of the ERRP were to identify and describe hypothetical risks scenarios and their associated adverse events in the event of leakage to USDWs, human health, or the environment; provide response actions for risk events with material outcomes, and consider the actions need to mitigate a release, including detection, response actions, and notification requirements. ExxonMobil has already created several engineering design and planning safeguards to reduce the potential of the event from occurring in the first place. These steps are based on ExxonMobil's global experience and expertise with risk management for events in site selection, well drilling and completion, and reservoir operations. Additionally, ExxonMobil understands that as the Project proceeds, additional data and information will be gathered for the Project that will be implemented within this plan with concurrent approval by the UIC

Program Director, which will further reduce risks to USDWs, human health, and the environment.

As discussed above for the Testing and Monitoring Plan, several hypothetical risk-based release scenarios were identified for risk assessment purposes. The nature of the risk scenarios included failure of mechanical integrity of the casing or cement of the injection wells, lack of UCCZ seal at a legacy well or artificial penetration, monitoring equipment failure, loss of structural integrity of the UCCZ, and an induced or natural seismic event. For each of these hypothetical scenarios, the mitigation plan aligns the severity of the event with a set of mitigation measures to avoid, detect, or respond with corrective action.

A number of risk reducing factors are or will be in place that will act to mitigate the severity of potential releases of CO2. Section 2 – Site Characterization describes how the geologic setting is consistent with safe CO2 sequestration because of the favorable injection zone and confining zone characteristics that exist at the site. Section 3 – Area of Review and Corrective Action Plan describes how the CO2 plume and pressure front are predicted to be confined to the injection zone and how pressure will be managed below critical pressures to reduce the potential for leakage to USDWs. The two artificial penetrations through the confining zones have been recompleted to safeguard USDWs within the AoR prior to commencing operations. Section 4 – Well Construction Plan and Operating Conditions describes how the well design process and operating controls for mechanical integrity and pressure control to maintain a high level of risk reduction for the Project. Section 6 – Injection Well Plugging Plan demonstrates how ExxonMobil will utilize construction materials and practices that will reduce the potential for migration of fluids from the injection zone. Lastly, Section 5 – Testing and Monitoring Plan and Section 7 – Post-Injection Site Care and Site Closure Plan, provide the data acquisition plan for tracking the CO2 plume and brine pressure front to assess compliance with control and containment requirements.

Emergency and Remedial Response GSDT Submissions

GSDT Module: Project Plan Submissions

Tab(s): Emergency and Remedial Response tab

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

☒ Emergency and Remedial Response Plan ***[40 CFR 146.82(a)(19) and 146.94(a)]***

1.13 Injection Depth Waiver and Aquifer Exemption Expansion

ExxonMobil is not requesting an injection depth waiver [40 CFR 146.82(d) and 146.95(a)] or aquifer exemption expansion request [40 CFR 146.4(d) and 144.7(d)]. If required in future updates of this Application, ExxonMobil with notify the UIC Program Director for requested waivers or exemptions.

Injection Depth Waiver and Aquifer Exemption Expansion GSDT Submissions

GSDT Module: Injection Depth Waivers and Aquifer Exemption Expansions

Tab(s): All applicable tabs

Please use the checkbox(es) to verify the following information was submitted to the GSDT:

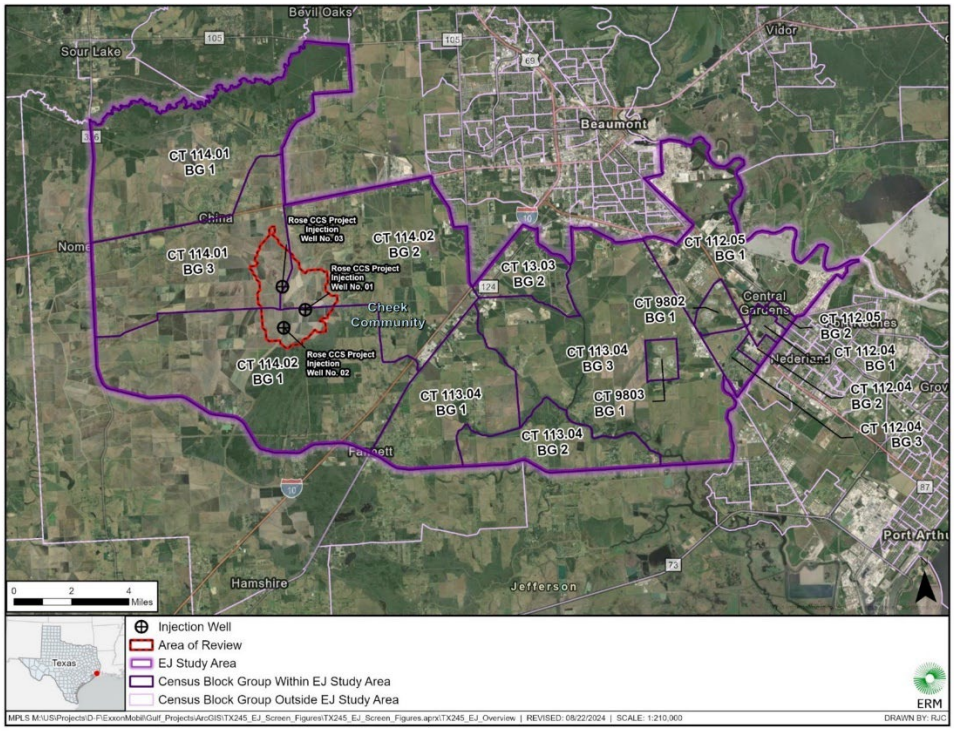
☐ Injection Depth Waiver supplemental report ***[40 CFR 146.82(d) and 146.95(a)]***

☐ Aquifer exemption expansion request and data ***[40 CFR 146.4(d) and 144.7(d)]***

1.14 Environmental Justice

An Environmental Justice (EJ) Screening Report is presented in Section 10 – Environmental Justice for the Project as an assessment of the potential for EJ-related concerns to arise for the Project. The major findings from the Application included identifying Census Block Groups near the Project, review of social economic demographics, and assessing potentially impacted communities (Figure 10-1 reproduced from Section 10 of the Amendment).

Figure 10-1: Census Block Groups within EJ Study Area



Significant progress has been made in working with the local communities which align with the EPA's August 2023 memo "Memorandum of Environmental Justice Guidance for UIC Class VI Permitting and Primacy" (Fox, 2023), which emphasized addressing EJ concerns and

demonstrating community involvement. ExxonMobil is committed to developing a positive, long-term relationship with local communities through transparent and collaborative engagement. This commitment is demonstrated, among other ways, by ExxonMobil being engaged with various stakeholders that include landowners, community leaders, elected officials, and local organizations. Engagement has occurred in multiple formats that include the formats of community gatherings, town halls, individual meetings, and open houses. The engagement is guided by the Stakeholder Engagement Plan, which is periodically updated based on community feedback.

Stakeholder feedback is received through initial field work for the development of the Project's Local Economic Development Plan (LEDP), the Community Grievance Mechanism (CGM), and ongoing engagement. LEDP stakeholder feedback is gathered through an analysis of existing local capabilities, economic impact modeling, field-based stakeholder interviews, and focus groups involving 15 community organizations. The LEDP will identify and implement social and economic programs that benefit the community. The CGM allows stakeholders to submit Project complaints, concerns, and/or feedback, which allows for community input to be acknowledged, tracked, and addressed in a timely and transparent manner.

Over 40 meetings with local community stakeholders have been completed to date. Current Project feedback has included community concerns related to safety and emergency response, community infrastructure, noise, and lease agreements. As a result of this feedback, ExxonMobil has committed more than $1 million USD to the Cheek community to support equipment and training for safety and emergency response, community infrastructure, and education. ExxonMobil plans to commit an additional $5 million USD in community investment to Cheek and the surrounding community to further support identified community needs through the first 10 years of injection. Allocation of funds will be achieved through a diverse committee comprising local representatives tasked with identifying and prioritizing opportunities to improve the community.

ExxonMobil has been working with local Emergency Service Districts to address concerns about emergency response capabilities. This includes providing training and equipment to local firefighters and considering grants to support full-time staff. Based on early feedback from initial engagements, ExxonMobil has adjusted its engagement formats from open houses to townhall-style meetings to better suit community preferences. ExxonMobil has addressed specific concerns related to noise and vibrations related to drilling operations via a noise study and noise/vibration nuisance response plan. Additionally, lease agreements have been updated to limit surface rights to emergencies only, addressing concerns about property investment. The EJ analysis and assessment for the Project will continue to be refined and updated throughout the life of the Project. Activities are underway to address specific community feedback, with next steps that include continued feedback via CGM and community engagements; ongoing response to community concerns and grievances; continued refinement of management and mitigation plans based on community feedback; and evaluation of initial project benefits with communities.

1.15 Permits and Construction Approvals for Rose CCS Project

Table 1-3 summarizes the federal, state, and local permits that have been acquired for the Project in accordance with 40 CFR 144.4. This table has been updated based on in-progress and completed permits for the Project.

Table 1-3: Summary of Permits and Construction Approvals for Rose CCS Project

Location	Permit and Authorization	Permit Number	Filing/Completion Date	Anticipated Receipt Date	Status
Jefferson County					
Rose CCS Project	Road Use Agreement/ Overweight Vehicle Permit	Not Applicable	March 1, 2024	March 1, 2024	Complete
Texas Commission on Environmental Quality					
Stratigraphic Well (Bead Farm Co. #1)	OTS	43002(EPA ID TXP490356091)	September 20, 2023	November 21, 2023	Complete
Rose CCS Project Injection Well No. 01	OTS	43358	June 14, 2024	June 16, 2024	Complete
Rose CCS Project Injection Well No. 01	OTS	43428	August 2, 2024	September 1, 2024	Complete
Rose CCS Project Injection Well No. 02	OTS	43378	June 30, 2024	July 3, 2024	Complete
Rose CCS Project Injection Well No. 02	OTS	43452	August 9, 2024	September 9, 2024	Complete
Rose CCS Project Injection Well No. 03	OTS	43402	July 25, 2024	July 28, 2024	Complete
Rose CCS Project Injection Well No. 03	OTS	43463	August 20, 2024	September 19, 2024	Complete
Rose CCS Project In-Zone Monitoring Well No. 01	OTS	43435	August 16, 2024	August 21, 2024	Complete
Stratigraphic Well (Bead Farm Co. #1)	CGP SWPPP	Not Applicable	April 5, 2023	April 5, 2023	Complete

Location	Permit and Authorization	Permit Number	Filing/Completion Date	Anticipated Receipt Date	Status
Rose CCS Project Injection Well No. 01	CGP SWPPP	Not Applicable	June 15, 2023	June 15, 2023	Complete
Rose CCS Project Injection Well No. 02	CGP NOI and SWPPP	TXR1504QF	March 8, 2024	March 8, 2024	Complete
Rose CCS Project Injection Well No. 03	CGP SWPPP	Not Applicable	March 8, 2024	March 8, 2024	Complete
Rose CCS Project In-Zone Monitoring Well No. 01	CGP SWPPP	Not Applicable	September 1, 2024	September 1, 2024	Complete
Stratigraphic Well (Bead Farm Co. #1)	MSGP NOI and SWPPP	TXR05GF22	August 30, 2023	August 30, 2023	Complete
Rose CCS Project Injection Well No. 01	MSGP NOI and SWPPP	TXR05GL22	June 10, 2024	June 10, 2024	Complete
Rose CCS Project Injection Well No. 02	MSGP NOI and SWPPP	TXR05GL23	June 10, 2024	June 10, 2024	Complete
Rose CCS Project Injection Well No. 03	MSGP NOI and SWPPP	TXR05GL24	June 10, 2024	June 10, 2024	Complete
Rose CCS Project In-Zone Monitoring Well No. 01	MSGP NOI and SWPPP	TXR05GM62	August 13, 2024	August 13, 2024	Complete
Stratigraphic Well (Bead Farm Co. #1)	MSGP NOT	Not Submitted	Not Submitted	TBD	In Progress
Rose CCS Project Injection Well No. 01	NOT	Not Submitted	Not Submitted	TBD	In Progress
Rose CCS Project Injection Well No. 02	CGP NOT	Submitted	August 20, 2024	August 20, 2024	Complete

Location	Permit and Authorization	Permit Number	Filing/Completion Date	Anticipated Receipt Date	Status
Rose CCS Project Injection Well No. 02	MSGP NOT	Not Submitted	Not Submitted	TBD	In Progress
Rose CCS Project Injection Well No. 03	MSGP NOT	Not Submitted	Not Submitted	TBD	In Progress
Rose CCS Project In-Zone Monitoring Well No. 01	MSGP NOT	Not Submitted	Not Submitted	TBD	In Progress
Railroad Commission of Texas					
Stratigraphic Well (Bead Farm Co. #1) API: 245-32908	GW-1 / GW-2	368887	June 19, 2023	June 19, 2023	Complete
Rose CCS Project Injection Well No. 01 API: 245-32913	GW-1 / GW-2	389625	December 18, 2024	December 31, 2024	Complete
Rose CCS Project Injection Well No. 01 API: 245-32913	GAU No Endangerment Determination	390197	January 22, 2025	January 28, 2025	Complete
Rose CCS Project Injection Well No. 02 API: 245-32911	GW-1 / GW-2	389717	December 19, 2024	December 31, 2024	Complete
Rose CCS Project Injection Well No. 02 API: 245-32911	GAU No Endangerment Determination	390198	January 22, 2025	February 11, 2025	Complete
Rose CCS Project Injection Well No. 03 API: 245-32912	GW-1 / GW-2	389718	December 19, 2024	December 31, 2024	Complete

Location	Permit and Authorization	Permit Number	Filing/Completion Date	Anticipated Receipt Date	Status
Rose CCS Project Injection Well No. 03 API: 245-32912	GAU No Endangerment Determination	390199	January 22, 2025	January 28, 2025	Complete
Rose CCS Project In-Zone Monitoring Well No. 01	GW-1 / GW-2	382934	June 27, 2024	June 27, 2024	Complete
Broussard Trust-1	GW-1 / GW-2	380521	May 1, 2024	May 2, 2024	Complete
Stratigraphic Well (Bead Farm Co. #1)	SWR-13 Exception	125182	September 26, 2023	Not Applicable	Complete
Rose CCS Project Injection Well No. 01	SWR-13 Exception	130360	May 20, 2024	Not Applicable	Complete
Rose CCS Project Injection Well No. 02	SWR-13 Exception	130361	May 20, 2024	Not Applicable	Complete
Rose CCS Project Injection Well No. 03	SWR-13 Exception	130364	May 20, 2024	Not Applicable	Complete
Rose CCS Project In-Zone Monitoring Well No. 01	SWR-13 Exception	132309	July 22, 2024	Not Applicable	Complete
Stratigraphic Well (Bead Farm Co. #1)	W-1 Drilling Permit	891726	June 28, 2023	August 18, 2023	Complete
Rose CCS Project Injection Well No. 01	W-1 Drilling Permit	898448	March 27, 2024	April 5, 2024	Complete
Rose CCS Project Injection Well No. 02	W-1 Drilling Permit	898449	March 27, 2024	April 4, 2024	Complete
Rose CCS Project Injection Well No. 03	W-1 Drilling Permit	898450	March 27, 2024	April 17, 2024	Complete

Location	Permit and Authorization	Permit Number	Filing/Completion Date	Anticipated Receipt Date	Status
Rose CCS Project In-Zone Monitoring Well No. 01	W-1 Drilling Permit	901180	July 20, 2024	July 11, 2024	Complete
Stratigraphic Well (Bead Farm Co. #1)	W-2 Oil Well Potential Test, Completion or Recompletion Report, and Log	891726	February 22, 2024	May 10, 2024	Complete
Rose CCS Project Above-Zone Monitoring Well No. 01 (Bead Farm Co. #1)	W-2 Oil Well Potential Test, Completion or Recompletion Report, and Log	891726	April 14, 2025	2Q2025	Submitted
Rose CCS Project Injection Well No. 01	W-2 Oil Well Potential Test, Completion or Recompletion Report, and Log	898448	December 19, 2024	February 12, 2025	Complete
Rose CCS Project Injection Well No. 02	W-2 Oil Well Potential Test, Completion or Recompletion Report, and Log	898449	December 20, 2024	February 20, 2025	Complete
Rose CCS Project Injection Well No. 03	W-2 Oil Well Potential Test, Completion or Recompletion Report, and Log	898450	December 20, 2024	February 20, 2025	Complete
Rose CCS Project In-Zone Monitoring Well No. 01	W-2 Oil Well Potential Test, Completion or Recompletion Report, and Log	901180	December 23, 2024	January 30, 2025	Complete

Location	Permit and Authorization	Permit Number	Filing/Completion Date	Anticipated Receipt Date	Status
Broussard JE Jr-1	W-3a Notice of Intention to Plug and Abandon	Not Applicable	February 13, 2025	February 14, 2025	Complete
Broussard JE Jr-1	W-3 Plugging Record	Not Applicable	April 14, 2025	April 30, 2025	Complete
EPA					
Stratigraphic Well (Bead Farm Co. #1)	SPCC Plan	Not Applicable	August 30, 2023	August 30, 2023	Complete
Rose CCS Project Injection Well No. 01	SPCC Plan	Not Applicable	June 10, 2024	June 10, 2024	Complete
Rose CCS Project Injection Well No. 02	SPCC Plan	Not Applicable	June 10, 2024	June 10, 2024	Complete
Rose CCS Project Injection Well No. 03	SPCC Plan	Not Applicable	June 10, 2024	June 10, 2024	Complete
Rose CCS Project In-Zone Monitoring Well No. 01	SPCC Plan	Not Applicable	August 13, 2025	August 13, 2025	Complete
CGP = Construction General Permit; GW-1 = Groundwater Protection Determination Request; GW-2 = Groundwater Protection Determination; MSGP = Multi-Sector General Permit; NOI = Notice of Intent; NOT = Notice of Termination; OTS = one time shipment; SPCC = Spill Prevention Controls and Countermeasures; SWPPP = Stormwater Pollution Prevention Plan; SWR = Statewide Rule; TBD = to be determined					

1.16 Other Additional Project Information

At the time of this Application, no other information has been requested pursuant of 40 CFR 146.82(a)(21). If additional germane information is requested by the UIC Program Director, ExxonMobil will review the request and respond appropriately via the Project Information Tracking Module in the GSDT.

Prior to development of the Project, the following federal laws will be assessed for their applicability and potential impact. Currently, no impacts are expected.

- The Wild and Scenic Rivers Act, 16 U.S.C. 1273 et seq.—ExxonMobil will identify any national wild and scenic river that may be impacted by the activities associated with the Project.
- The National Historic Preservation Act of 1966, 16 U.S.C. 470 et seq.—In accordance with the National Historic Preservation Act, potential properties eligible for the National Register of Historic Places will be assessed within the area that may be impacted by the activities of the Project. For any historic properties identified, additional historic and/or cultural resource surveys will be conducted. The results of the surveys will be provided to the UIC Program Director.
- The Endangered Species Act, 16 U.S.C. 1531 et seq.—ExxonMobil will identify any endangered or threatened species that may be affected by the activities associated with the Project. If a previous endangered or threatened species survey has been conducted, provide the results of the survey.
- The Coastal Zone Management Act, 16 U.S.C. 1451 et seq.—Based on the location of the Project, the Coastal Zone Management Act is not applicable.

Underground Injection Control –Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

SECTION 2 – SITE CHARACTERIZATION

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage LLC

May 2025

SECTION 2 – SITE CHARACTERIZATION

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APPENDIX B – Site Characterization Files

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B.2: Bead Farm Co. #1 Laboratory Analyses

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B.4: Geochemical Water Samples

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APPENDIX I – Seismic Risk and Fault Slip Potential

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2.0 Site Characterization

ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) is submitting this Class VI Permit Application (Application) to the U.S. Environmental Protection Agency (EPA) for the Rose Carbon Capture and Storage Project (Project). Section 2 of the Application contains site characterization information in compliance with the requirements of Code of Federal Regulations, Title 40, Section 146.82(a)(3) [40 CFR 146.82(a)(3)] and Texas Administrative Code, Part 1 Title 16 Chapter 5. Site characterization data was obtained from the stratigraphic well (Bead Farm Co. #1; American Petroleum Institute [API] 4224532908) data acquisition and analysis program being conducted by ExxonMobil.

ExxonMobil is undertaking the Project in Jefferson County, Texas to sequester a maximum of five million metric tonnes per annum (MMta) of carbon dioxide (CO_2) per year for 13 years. The purpose of the site characterization section is to identify the potential risks and demonstrate to the satisfaction of the Underground Injection Control (UIC) Program Director that the Project site is suitable for the sequestration project. The key aspects of this demonstration are that the geologic formations provide adequate storage capacity to store the intended volume of injected CO_2 and a competent confining zone is present that will contain the injected CO_2 throughout the life of the Project.

ExxonMobil has completed a thorough review of site characterization data and analyses from multiple data types including public, proprietary, and licensed data sets. A high degree of confidence has been gained during this process regarding the effectiveness of the storage and confining properties of the sequestration site. The data obtained from the stratigraphic well aligns with the initial site characterization. This alignment strengthens the lines of evidence supporting the finding that the Class VI siting criteria requirements are satisfied and underground sources of groundwater (USDW) are protected.

2.1 Objectives

The following objectives were developed to demonstrate compliance with the requirements of 40 CFR 146.82:

- Provide maps and cross sections of the area of review (AoR) [40 CFR 146.82(a)(3)(i) and 146.82(a)(2)];
- Identify the location, orientation, and properties of known or suspected faults and fractures that may transect the confining zone(s) in the AoR, along with an assessment that they will not interfere with containment [40 CFR 146.82(a)(3)(ii)];
- Summarize available data on the depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of the injection and confining zone(s) and on lithology and facies changes [40 CFR 146.82(a)(3)(iii)];
- Discuss the available geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within the confining zone(s) [40 CFR 146.82(a)(3)(iv)];
- Summarize the available information on the seismic history of the area, including the presence and depths of seismic sources, and an assessment of the potential for seismicity to interfere with containment [40 CFR 146.82(a)(3)(v)];

- Provide geologic and topographic maps and cross sections illustrating regional geology, hydrogeology, and the geologic structure of the local area [40 CFR 146.82(a)(3)(vi)];
- Present maps and stratigraphic cross sections indicating the general vertical and lateral limits of the USDWs and water wells completion details within the AoR, their positions relative to the injection zone, and the direction of water movement (where known) [40 CFR 146.82(a)(5)]; and
- Summarize the available baseline geochemical data on subsurface formations, including the USDWs in the AoR [40 CFR 146.82(a)(6)].

2.2 Regional Geology

The Project is in Jefferson County, Texas within the Houston Embayment of the Gulf Basin, as presented on Figure B-1 (Roberts-Ashby et al., 2014). On shore and near-shore, the Gulf Basin is often referred to as the Gulf Coast region. The stratigraphic column of the Houston Embayment is presented on Figure B-2 (Baker Jr., 1995). The Gulf Basin was formed by crustal extension and seafloor spreading during the breakup of Pangea that took place in the Mesozoic Era. A regional unconformity at the base of the sedimentary section is marked by the base of an evaporite layer (Galloway, 2008). These substantial evaporitic deposits (up to 4 km thick) became a defining characteristic for later structural evolution of the Basin. Salt deposition ceased at the end of the Late Jurassic Era, as continued rifting produced oceanic crust.

The outline and morphology of the present-day Gulf Basin was sculpted by subsidence and rimming carbonate platform formation by the Early Cretaceous Era (Galloway, 2008). The Cenozoic Era depositional episodes along the northwestern Gulf Basin are fluvial-deltaic and shore-zone dominated, which reflect major phases of adjacent North American structural events (Galloway, 2008).

There were five major North American tectonic phases that influenced deposition in the Gulf Basin: (1) Laramide uplift, (2) the mid-Cenozoic thermal phase, (3) Basin and Range tectonism, (4) southern Appalachian and Cumberland Plateau uplift and erosion, and (5) Rocky Mountain plateau tectonic uplift. Specifically, the southern Appalachian and Cumberland Plateau uplift during the Cenozoic Miocene Epoch shifted the center of deposition from the northwest basin margin to the east, including present-day eastern Texas (Galloway, 2008).

Thick sedimentary sequence deposition within the Gulf Basin was initiated in the Cenozoic Era that included a series of “off-stepping” sediment wedges (Galloway, 2008). These sedimentary wedge sequences thicken basin-ward and were largely deformed by early Cenozoic-age growth faults that extend through Eocene and Oligocene-aged formations. The combination of subsidence and rapid sediment loading upon a thick salt substrate resulted in significant gravity tectonics. Some of these gravity tectonic structures include growth faults, allochthonous salt bodies, salt welds, listric normal faults, salt diapirs with their related synclines and minibasins, and basin-floor compressional fold-belts (Galloway, 2008). Hyper-subsidence caused periodic structural down-warp and oceanic transgression, resulting in shale deposition atop sand sequences. The Oligocene Epoch off-stepping deposition initiated underlying salt movement upward and basin-ward, creating major salt canopies (Galloway, 2008). Salt withdrawal facilitated by sedimentation resulted in the movement of salt basin-ward creating withdrawal

synclines and Gulf Shelf Minibasins, such as that underlying the Project area as presented in Figure B-3 (Galloway, 2008). The resulting salt canopies are located offshore.

As shown in Figure B-3, the Project site is contained within one of the northernmost and few land-based Shelf Minibasins, north of the Oligocene – Miocene Detachment. Figure B-4 is a regional cross section of the northern Gulf Coast region, constructed approximately 100 miles east of the Project and is labeled on Figure B-3 as Fig. 6 (Galloway, 2008). The upper cross section in Figure B-4 presents the geologic age and structural features of sedimentary units in the area, while the lower cross section presents the interpreted depositional environments along the same cross section. Onshore Miocene and Oligocene-age sediments exhibit relatively gentle dip in the vicinity of the Project, although formation dip steepens basin-ward and in areas with faulting within the Lower Miocene, Oligocene, and underlying strata, as well as in areas exhibiting underlying salt features. The associated depositional environment for the Oligocene and younger sediments are associated with fluvial deltas, shore zones, and sandy shelves (Galloway, 2008).

To summarize, the stratigraphy of the northern Gulf Basin exhibits characteristics associated with divergent continental margins. A major unconformity is evident at the base of the sedimentary column, marked by initial onlapping of strata along the subsiding basin margin. Subsequent to subsidence, basin margin aggradation occurred through off-lapping deposition, creating shelf edge and slope systems that exhibit faulting related to depositional loading and underlying salt movement (Galloway, 2008). This continued off-lapping deposition created the coastal plain and continental shelf, which have maintained a high degree of continuity throughout geologic time, up to the present day (Galloway, 2008). The depositional sequences throughout the Cenozoic Era are bounded by maximum flooding surfaces, marine and subaerial erosional unconformities, sediment starvation episodes, and faunal gaps (Galloway, 2008).

2.3 Major Stratigraphic Units: Confining and Injection Zones

The Project includes a Miocene-age upper composite confining zone (UCCZ) belonging to the Fleming Formation and includes the Amphistegina ‘B’ (Amph ‘B’) Shale marker. The UCCZ is a fine-grained, muddy and the Amph ‘B’ is a regionally extensive shale (Galloway, 2008). All formations underlying the UCCZ and overlying the lower confining zone (LCZ) are included in the injection zone, with the exception of the Anahuac Shale.

The injection intervals of the Fleming Formation underlie the UCCZ. The Fleming Formation includes three sand intervals, identified in the Application and sub-divided into the Fleming Sand 1, Fleming Sand 2, and Fleming Sand 3, from shallowest to deepest. The Anahuac Shale occurs below the three Fleming Sand intervals and serves as a laterally continuous, interim sealing unit and a significant vertical flow barrier above the Oligocene-age Upper Frio Formation (Trevino and Meckel, 2019). The Upper Frio Formation is the lower injection interval. Locally, the Upper Frio Sands are sub-divided into Upper Frio Sand 1 and Upper Frio Sand 2, from shallowest to deepest. Both the Fleming and Upper Frio injection intervals are laterally extensive. When used, the term “upper injection interval” refers to the three sand intervals in the Fleming Formation and the term “lower injection interval” refers to the two sand intervals in the Upper Frio Formation.

The LCZ below the Upper Frio injection interval is composed of thick, extensive shale (Loucks et al., 1978). The stratigraphic column of the area is presented in Figure B-2 and shows the stratigraphic relationship of the Fleming Formation, Anahuac Shale, and Frio Formation.

Figure B-5 displays the Cenozoic depositional episodes from the Upper Oligocene through the Pliocene in the Gulf Coast Region (Trevino and Rhatigan, 2017), with additional detail provided for Upper Oligocene through the Lower and Middle Miocene depositional sequences that comprise the injection zone and UCCZ. The episodes shown on Figure B-5 show the regressive sequences that coincided with higher rates of terrigenous sediment supply and that are bounded by transgression at the top of each sequence. For example, the upper portion of the Amph 'B' Shale is marked by a transgressive sequence between the Middle and Lower Miocene. Oligocene sediments of the Frio in the Gulf Coast region are comprised of fluvial to near-shore sands, while Miocene sediments are fluvial to fluvial-dominated deltaic sands. In general, the Oligocene-Miocene along the Gulf Coast is characterized "as a thick wedge of regressive deltaic sands, silts, and clays" interspersed with transgressive marine-shale tongues (Bearb, 2014).

To summarize the depositional sequences, the Frio begins with transgressive, clay-rich shelf-slope shales that underlie massive deltaic sands deposited by the fluvially dominated Houston and Central Mississippi deltas. Reworking of these deltaic deposits created thick, sand-rich prograding shore-zone systems lateral to and atop muddy shelf deposits. That is, the Early Oligocene Frio is composed of muddy shelf-slope shales interfingered up-section with massive deltaic sands (Upper Frio) that were reworked as sand-rich prograding shore-zone systems. The Anahuac Shale overlies the Frio and represents a period of transgression, followed by deposition of thick Miocene successions of fluvial to fluvially dominated deltaic sands.

Figure B-6 displays an overview of the interpreted Gulf Coast region depositional environments during the Lower Miocene and Oligocene (modified from Galloway et al., 2000). As shown in this figure, during the Oligocene, much of the Houston Embayment area near the Project location exhibited a shore-zone depositional environment. Sedimentation at the Project area transitioned up-section to a mixed load dominated fluvial environment during the Lower Miocene. Overall, the depositional system from the Oligocene through the Middle Miocene resulted in alternating shales and sand beds representing a depositional history of transgressive-regressive sequences.

2.3.1 Lower Confining Zone

The LCZ is comprised of over 3,000 feet (ft) of thick Frio sediments, dominated by fine-grained lithologies (shales), which underlie the Upper Frio injection interval. Few wells have log data to verify the gross thickness of this interval near the site. ExxonMobil relied on seismic data to assess the occurrence and lateral continuity of LCZ as discussed in the description of shale deposition associated with the Frio Formation.

While not included in the LCZ, the Vicksburg Formation is a ubiquitous Upper Texas Gulf Coast interval underlying the shales of the Frio Formation and is comprised primarily of shales resulting from muddy prodeltaic shelf deposition (Loucks et al., 1978). Sand deposition increases up-section, though sand occurrence within the Vicksburg in the Upper Texas Gulf Coast was more isolated compared to the sands found in the Lower Texas Gulf Coast. The

Vicksburg can also be considered a regional confining unit along the Gulf Coast (Chowdhury and Turco, 2006).

2.3.2 Upper Frio Formation

The Frio Formation consists of alternating shales and sands, stemming from progradational shore-zone systems of the Gulf coastal plain. Specifically, in the Houston area and during the Early Oligocene, deposition of large volumes of sand from the fluvially dominated Houston and Central Mississippi deltas occurred, with subsequent wave reworking resulting in thick, sand-rich prograding shore-zone systems fronted by muddy shelf sequences (Galloway et al., 2000). Also, periodic salt withdrawal during the Mid-Oligocene triggered a brief phase of tilting, collapse, and submarine erosion that interrupted margin progradation.

Long-term retreat of the Houston and Central Mississippi Delta systems occurred during the late Oligocene Era, although high sediment load allowed for aggradation of coastal plain, delta and shore-zone systems at this time associated with the Upper Frio. Galloway et al. (2000) indicates that between deltaic systems, the Frio contains wave-dominated shore-zone systems "nourished by longshore reworking of sediment from the deltaic headlands." At the Project site, the Upper Frio injection zone intervals are identified as Upper Frio Sands 1 and 2, from shallowest to deepest. Regionally, the reservoir quality of the Frio in the Houston Embayment area exhibits porosities ranging from 16 to 36 percent (%) and permeabilities of approximately 50 to 3,000 millidarcies (mD) (Swanson et al., 2013). The analysis of core data from the stratigraphic well showed porosity values to be generally consistent with regional data, with some of the best quality sands within the Upper Frio Claimed as PBI [redacted]. Appendix B.2 presents the available core analyses results.

2.3.3 Anahuac Formation

The Anahuac Formation is located within the injection zone, overlying the Frio Formation, and underlying the Fleming Formation. It is a thick, continuous shale interval. The Anahuac Formation (Anahuac Shale) was deposited during a transgressive event following Frio deposition (Galloway, 2008). Prograding Miocene intervals, including the Fleming Formation, cap the Anahuac transgression (Swanson et al., 2013).

2.3.4 Fleming Formation

Early Miocene sediments of the Fleming Formation at the Project site are comprised of thick successions of fluvial to fluvially dominated deltaic sands that include more proximal facies than that of the underlying Oligocene-aged Frio intervals. The Red River became the dominant fluvial source, resulting in deposition of the fluvially dominated Calcasieu Delta System (Galloway et al., 2000). During the Miocene, hyper-subsidence and collapse were observed and resulted in subsidence events and periodic deposition of mudstones and transgressive shales that are interbedded throughout the Lower Miocene. Note that the Lower Miocene is referred to as the Fleming Formation and Oakville Sandstone throughout the Texas Gulf Coast, depending on the location (Chowdhury and Turco, 2006). In the Upper Gulf Coast region, the Fleming is the primary name of the Lower Miocene section.

The Lower Miocene was characterized by high sediment supply rates and general deltaic progradation in the Project area. Some transgressive sequences interrupted the Lower Miocene

deposition, but the Lower Miocene is mainly bracketed by the underlying Anahuac Shale and overlying UCCZ that include the Amph 'B' Shale as the major transgressive sequence.

South of the Project site, the estimated porosities of the Miocene reservoirs range from 5 to 38%, with an average of 28% (Carr et al., 2017). A review of available literature also indicated that permeabilities range from 16 to 1,600 mD with an average of 338 mD (Carr et al., 2017). Analysis of the Lower Miocene sands at the Project site show consistent reservoir characteristics, Claimed as PBI [redacted] Core data from the stratigraphic well are included in Appendices B.1 and B.2 of this document.

2.3.5 Upper Composite Confining Zone

The UCCZ is a thick, muddy sequence that includes the Middle Miocene Amph 'B' Shale, a regionally continuous, transgressive marine unit (Galloway, 2008), that is recognized by the U.S. Geological Survey (USGS) National Assessment of Carbon Dioxide Storage Resources to be a good sealing unit and, therefore, a competent confining zone as required for CO2 sequestration project sites (Roberts-Ashby et al., 2014). Additionally, Carr et al. (2017) further define the Amph 'B' as:

"A mudrock unit informally called the Amph B and encompassing the Amphistegina B biochrono stratigraphic zone is the thickest and most extensive regional confining zone in the Miocene section of the upper Texas coast. The Amph B records a major transgressive event in the northwest Gulf Basin that marks the end of the early Miocene" (Carr et al., 2017).

2.3.6 Regional Shale Beds

The Anahuac and the UCCZ, including the Amph 'B' Shale, are among those that are considered regional shale marker beds. The Amph 'B' Shale can be regionally correlated in logs and is thick enough to be identifiable in seismic datasets. Gulf Coast hydrocarbon production trends also indicate that the Amph 'B' Shale provides a regional fluid-migration barrier (Lu et al., 2017). The Anahuac Shale is a "world class seal" consisting of a regional shale bed in the Houston Embayment that provides a competent confining zone for hydrocarbons (Swanson et al., 2013). Based on the ability of the Anahuac Formation to trap hydrocarbons, the Anahuac Formation is considered as a confining zone restricting the vertical movement of CO2 and will effectively isolate the Upper Frio Formation from the Fleming Formation.

2.4 Regional Structural Setting

The Project site is located in the Houston Embayment as shown on Figure B-1. Sedimentary units in the region generally dip toward the center of the Gulf, roughly perpendicular to the coastline, as shown on Figure B-7, which presents the structural elevation of the Frio Formation top (Swanson et al., 2013). The Miocene units generally follow this structural trend, also dipping toward the center of the Gulf. Figure B-8 presents a regional dip-oriented cross section showing the formations deepening to the southeast (Baker, 1995). As shown in Figure B-8, the top of the Anahuac and underlying formations deepen quickly to the southeast of the Project site, reflecting the depositional system and the numerous faults in the region.

Faulting in the area includes syndepositional normal faults, with the downthrown blocks typically occurring toward the Gulf. These are largely classified as growth faults that are common in the Gulf Coast region and were formed by simultaneous subsidence during sediment loading

(Loucks et al., 1978). For example, the Vicksburg and Frio Formations are transected by these types of faults related to rapid sediment loading and subsidence, occurring within broad fault zones (i.e., the Frio Fault Zone and the Vicksburg Fault Zone, Figure B-9). The Vicksburg Fault Zone occurs southeast of the Project site, as shown on Figure B-9 (Loucks et al., 1978). Similarly, major faults occur within deeper portions of the Frio Formation in the Frio Fault Zone. (Loucks et al., 1978). Major faults in the region occur most frequently in Oligocene units, although some faults may extend to the Miocene and up to ground surface. Many oil and gas fields in the Houston Embayment contain Oligocene production, indicating that the faulting in the region often facilitates both structural and stratigraphic trapping (Swanson et al., 2013).

As discussed in more detail below, faults in the Project area are less common than reported for the region and are characterized as post-depositional normal faults with the majority having minor amounts of offset in the injection and upper confining zone.

2.5 Site Geology

2.5.1 Overview

Regional geologic observations informed the initial local geologic characterization process. ExxonMobil took advantage of site-specific and sub-regional characterization data to fulfill the requirements listed in 40 CFR 146.82. The data sources used for site characterization within and surrounding the AoR include various regional and local publications, seismic data (two-dimensional [2D] and three-dimensional [3D]), existing well logs, along with limited pressure and core data.

An extensive list of test results were analyzed and used to refine the site-specific geologic characterization:

- fluid samples gathered from multiple sands in the Frio, Fleming, and the first water-bearing zone overlying the UCCZ;
- mineralogy x-ray diffraction (XRD) of the Frio and Fleming intervals;
- core descriptions;
- computed tomography scans;
- photos of the Frio, Anahuac, Fleming, and UCCZ routine core analysis results from the Frio and Fleming;
- geomechanical information from core and step rate testing, capillary pressure data, falloff test results; and
- additional advanced log analysis from the stratigraphic well (e.g., nuclear magnetic resonance [NMR] logs), as well as spectral gamma and mud log information.

Appendices B.1 to B.3 provide these data.

2.5.2 Summary of Detailed Analyses for Site-Specific Geological Characterization

The following list presents the topics for detailed analysis in the site-specific geological characterization:

- The location, orientation, and properties of known or suspected faults and fractures that may transect the confining zones in the AoR and a determination that they would not interfere with containment [40 CFR 146.82(a)(3)(ii)];
- Review of the available data on the depth, areal extent, and thickness of the injection and confining zones, and facies changes based on analysis of literature data and the stratigraphic well geophysical well log and core analyses;
- Assess data on the depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of the injection and confining zone(s) including geology/facies changes [40 CFR 146.82(a)(3)(iii)];
- Evaluation of the available geomechanical information on fractures, stress, ductility, rock strength, and in situ fluid pressures within the confining zone(s) [40 CFR 146.82(a)(3)(iv)];
- Provide maps and stratigraphic cross sections indicating the USDWs, water wells and springs within the AoR, their positions relative to the injection zone, and the direction of water movement, where known [40 CFR 146.82(a)(5)]; and characterize the geochemistry of the subsurface formations.

2.5.3 Site-Specific Data Acquisition

Local site characterization was based on data and analyses obtained from public and private sources of information. Analyses of the local geological properties were completed using core samples from the stratigraphic well, which was drilled in October and November 2023. Data obtained from the stratigraphic well are outlined in Table 2-1, Tables 2-2a and 2b, and Table 2-3. Table 2-1 presents the wireline logging program, Table 2-2a presents the coring acquisition program, Tables 2-2b and 2-2c present the recovered whole core intervals and rotary sidewall cores with their corresponding formations. Table 2-3 presents the core analysis program. Table 2-4 presents the formation tops at the stratigraphic well and injection wells. Table 2-5 presents formation tops associated with type log wells. Table 2-6a presents XRD mineralogy data obtained at the stratigraphic well, and Table 2-6b presents XRD data from the Broussard Trust #1 Well (API: 4224501690). For clarity, there are multiple wells with the same name in Texas (i.e. Broussard Trust #1) so in this section they are differentiated by API number.

2.5.4 Site Location and Identification of Injection Intervals and Confining Zones

A site overview map is provided as Figure B-10. This figure presents the regulatorily required data as presented in [40 CFR 146.82(a)] and includes the location of the proposed injection wells, state or EPA-approved subsurface cleanup sites, surface bodies of water, springs, mines (subsurface and surface), and quarries. The figure also shows, within the AoR, the location and name or number of the injection, producing, abandoned, plugged, dry, deep exploration, or water wells that were identified in a rigorous search of available information. In addition, other surface features including structures intended for human occupancy, state, Tribal and Territorial Boundaries, and roads are presented.

Figures B-11a and 11b present the base map specific to geophysical survey sources and the well data that were utilized for the site characterization and the development of the geologic model for the Project. Figure B-11a presents the local seismic lines parallel and perpendicular to dip, which is also shown on Figures B-36 and B-37. The local cross section locations are also

shown in Figure B-11a and B-11b and well locations associated with the cross sections shown on Figures B-12 and B-13. The cross sections on these maps are presented for orientation purposes.

As presented in the regional geology subsection, the UCCZ overlying the injection zone consists of a thick, muddy interval that includes the Amph 'B' Shale. After reviewing the available data on the Amph 'B' Shale marker, ExxonMobil concluded that a site-specific data collection program was warranted to characterize the physical properties of the Amph 'B' Shale.

The UCCZ layer is shown in the well cross sections in Figures B-12 and B-13 where the fine-grained muddy interval is evident. This layer was confirmed to exist by the analysis of the geophysical logging and sampling results of the stratigraphic well. The potential for vertical flow out of an injection zone was evaluated by comparing the baseline temperature and pressure data at various depths within the injection zone and above the UCCZ, as shown on Figure B-14. Overall, the temperature and pressure measurements reflect the difference in geophysical and mineralogical differences between the intervals of interest as confirmed by the analysis of core data from the stratigraphic well.

The pressure gradient values shown on Figure B-14 were derived from pressure data collected at its respective depth and is calculated by dividing pressure by the depth at which the pressure was measured. A review of Figure B-14 indicated that different pressure regimes are present within the overlying sands, the injection intervals of the Fleming sands and the Frio sands, and the underlying sands.

The UCCZ separates the injection zone from the overlying formations. Claimed as PBI [redacted] The UCCZ shales provide a high degree of isolation in the UCCZ and support the conclusion that no significant cross-flow potential of CO2 and brine from the Fleming sands to the water-bearing zone above the UCCZ is apparent.

In addition to the UCCZ, the Anahuac Shale offers isolation between the Fleming and Upper Frio injection intervals. Due to the low permeability and the pervasive thickness of this shale, vertical cross flow between the Frio and Fleming injection intervals is not projected to occur. Claimed [redacted] Isolation between the Fleming and Upper Frio intervals is shown in the pressure data collected in the stratigraphic well and included in Figure B-14 and Appendix B.2.

The LCZ consists of underlying Frio shales that would reduce the potential for any downward migration of formation fluids or CO2 out of the injection zone. A notable baffle is present at the base of the Upper Frio injection interval where the underlying sands have an approximate Claimed as P [redacted] pressure gradient difference and an approximate temperature difference of Claimed as PBI [redacted] from the overlying Frio sands, shown on Figure B-14.

2.5.5 Top and Bottom Elevations of Injection and Confining Zones

The formation tops at the stratigraphic well and Project Injection Wells No. 01, No. 02, and No. 03 are provided in Table 2-4. The local structural dip in the area is oriented toward the Gulf to the south-southeast. Figure B-12 shows a cross-section orientation generally perpendicular to dip through the AoR. Figure B-13 presents a cross-section orientation that is generally parallel to dip through the AoR. These cross sections identify the top of the UCCZ and the top of the Fleming injection intervals as well as the three distinct sand intervals (Fleming Sand 1, Fleming Sand 2, and Fleming Sand 3) with the intervening shale intervals. Figures B-12 and B-13 also show the top of the Anahuac Shale and the Upper Frio injection interval with the two associated sand-rich intervals referred to as Upper Frio Sands 1 and 2. Figures B-12 and B-13 identify the base of the Upper Frio injection zone corresponding to the top of the LCZ.

As shown on the cross sections (Figures B-12 and B-13), the confining zones and injection intervals are laterally continuous throughout the Project area. The sands of the Fleming Formation are continuous as are the shale-rich interbeds between the Fleming Sand 1, Fleming Sand 2, and Fleming Sand 3 intervals. While continuous in the vicinity of the Project site, the thickness of these three sand intervals varies from approximately 440 ft to 1,100 ft and the two interbedded shale intervals between Fleming Sand intervals (not including the UCCZ) range in thickness from approximately 100 to 210 ft within the AoR. Similarly, the Upper Frio injection interval is consistently present and continuous in the Project area, although sands within the Upper Frio appear more prevalent and thicker within the AoR and east/northeast of the AoR.

The cross-section orientations (Figures B-12 and B-13) also illustrate the lateral thickness and continuity of the UCCZ and Anahuac Shale across the AoR. Log data for the stratigraphic well were used for stratigraphic purposes in addition to the original type well selected for this site, Broussard JE Jr-1 (API 4224502193), which is located near Injection Well No. 01. The stratigraphic well confirmed the thicknesses of the UCCZ, Fleming and Upper Frio injection intervals, and interbedded shales. The log data from Broussard JE Jr-1 provided a basis to evaluate formation top elevations, formation thickness, and lithologies from the UCCZ to below the base of the injection zone. Note that while the Broussard well extends through the base of the injection zone, it did not extend far into the LCZ. Therefore, the Walter Co – 1 (API 4224531725) was used as the type log for the LCZ.

The identified formation tops from the stratigraphic well, Walter Co – 1 and Broussard JE Jr-1 type wells are provided in Table 2-5. Table 2-5 and Figure B-15 presents the Broussard JE Jr-1 type log showing spontaneous potential (SP; track 2) and resistivity (track 4) log data from the top of the UCCZ to the LCZ. In addition, the volume of shale (referred to as Vshale; track 3) estimated from the SP log is shown on Figure B-15. The corresponding net and non-net log (track 5) and the facies log (track 6) are also presented. Tracks 4, 5, and 6 provide important information to build the geologic model, discussed in detail in Section 2.8 – Reservoir Characterization and 3D Geologic Modeling. The Vshale curve is analyzed using cutoffs to identify net reservoir thickness (potential injection intervals) and to identify lithologies of the confining and injection zone.

Sands are the primary lithology for the injection intervals in both the Fleming and the Upper Frio. These sands contain interbedded shales of varying thicknesses. Based on the Broussard JE Jr-1 (Figure B-15) and the stratigraphic well log (Figure B-16), the Fleming Sand 3 interval is

thickest within the Lower Miocene-age section and is comprised of several thick, relatively clean sandstone bodies. The Upper Frio contains multiple sand bodies with inter-bedded shales, particularly the Upper Frio Sand 1 (Figure B-15).

In summary, the core data from the stratigraphic well, legacy well logs, literature on regional geology, and seismic data were all used to identify and characterize the injection zone and confining zone depths and properties. Formation thickness values were based on well logs combined with 2D and 3D seismic data interpretation. The net sand maps are sourced from historical well data and confirmed through analysis of data from the stratigraphic well.

An evaluation of the stratigraphic well data confirmed the pre-drill estimates of the net and non-net thickness of the injection and confining zones. These data were combined with the legacy well information to build a 3D geologic model, described below.

2.5.6 Geologic Characteristics of the Injection Zone

The depth, areal extent, thickness, mineralogy, porosity, permeability, and capillary pressure of the injection zone are based on lithology and facies changes and were developed for each of the Frio and Fleming injection intervals to demonstrate how the geological features of each interval align with the target storage volumes [40 CFR 146.82(a)(3)(iii)]. The core descriptions, core photos, mineralogy, core porosity and permeability, and capillary pressure are included in Appendices B.1 and B.2.

As presented above, the injection zone for the Project consists of the Upper Frio injection interval and the Fleming Sand 1, Fleming Sand 2, and Fleming Sand 3 injection intervals. The Upper Frio and Fleming sand intervals are separated by the Anahuac Shale. The injection strategy, presented in Sections 3 and 4, includes a series of staged well completions for each injection well, to optimize storage of CO2 within the AoR at pressures that are protective of USDW.

While sediment deposition in the Upper Frio and Fleming Formations were both fluvially dominated, the Upper Frio injection interval is interpreted to have been shore-zone influenced while the three Fleming Sand injection intervals appear to have been sourced in a deltaic channel environment. Fleming Sand 1 is the uppermost injection interval immediately below the UCCZ and Fleming Sand 3 is the lowermost injection interval within the Fleming Formation, located immediately above the Anahuac Shale. These injection intervals are continuous across the AoR.

2.5.6.1 Fleming Injection Intervals

Figure B-15 illustrates the alternating shales and sands of the Fleming Formation and the internal division of Fleming Sand 1, Fleming Sand 2, and Fleming Sand 3, separated by shale-rich zones. The Fleming Formation Sands have been observed to be fine to medium-grained sands (Galloway et al., 1986). A review of the core descriptions included in Appendices B.1 and B.2 shows the sand intervals to be comprised of very fine to medium-grained sands at the Project site.

Figure B-16 shows the sand bed thickness differences in the three Fleming Sands based on the stratigraphic well and shows the presence of various interbedded shales. The Fleming Sand packages are continuous throughout the AoR, but the thicknesses of these sand beds are variable, as shown on Figures B-12 and B-13. The Fleming Sand 1 isochore map (Figure B-17)

identifies the gross interval thickness, including both shales and sands, within the interval. A review of the stratigraphic well mud-logging data indicated that the Fleming Sand 1 is composed of predominately unconsolidated, very fine to fine grained, subrounded to rounded, well sorted, sandstone that is non-calcareous to calcareous[1]. Interbedded shale thickness increases toward the base of Fleming Sand 1 and grades into the Fleming Shale 2. Of 28 XRD samples analyzed within the Fleming Shale 2, an average quartz content of Claimed as PBI and total clay content of Claimed as PBI were calculated.

The gross Fleming Sand 1 interval thickness is approximately 445 to 645 ft within the AoR. The net sand map of the Fleming Sand 1 interval is presented on Figure B-18. The net sand thickness map removes the thickness of the interbedded shale layers that will not contribute to the injectivity or storativity of the CO2.

As shown on Figure B-18, an estimated 210 to 570 ft of net sand thickness was identified within the AoR. The net thickness maps were derived by extrapolating the net thicknesses from the VShale logs at the various well locations within the geologic model. The net thicknesses are a 2D representation for each interval and were used in the 3D extrapolation of net thickness within the geologic model. Net thickness was derived using a shale cutoff of Claimed as PBI with legacy well data, where any values of less than Claimed as PBI shale contribute to the net thickness. The offset wells were used as control points and guided by geologic concepts to map the depositional trends. For the geologic model, an approximate 13- by 13-mile area was used for the AoR and surrounding area. Additional information on this modeling approach is described Section 2.8.3 – Net and Non-Net Model.

The gross Fleming Sand 2 interval thickness is approximately 630 to 770 ft within the AoR. The net sand thickness map of the Fleming Sand 2 interval is presented on Figure B-20 and is estimated, using the VShale log curve, to range from approximately 150 to 420 ft of net sand within the AoR near the proposed injection wells.

The Fleming Sand 2 isochore map is presented on Figure B-19 and shows the gross interval thickness, including both shales and sands, within the interval. A review of the stratigraphic well data indicated that the Fleming Sand 2 is composed of predominately unconsolidated, very fine to fine-grained, subrounded, moderately sorted quartz sandstone with calcareous cement (concretions). Sandstone is interbedded with slightly silty argillaceous to calcareous mudstones. Shale content increases with depth and grades into the Fleming Shale 3.

XRD analyses were performed on the stratigraphic well samples collected from the Fleming Sand 2, included in Table 2-6a. Two samples from 4,479.0 and 4,479.6 ft KB contain an average of Claimed as PBI quartz with average total clays of Claimed as PBI Potassium feldspar comprises an average of Claimed as PBI in these samples, with plagioclase present at an average of Claimed as PBI Kaolinite is present at an average of Claimed as PBI respectively, within the samples and illite/smectite

[1] Lithological descriptions that were based primarily on mud-logging data are intended to be for qualitative description purposes and provide additional information to supplement the lithological descriptions that were based on the core sample analyses. The reason for this approach is that unconsolidated sands are typically lost with the mud returns and shales and cemented intervals are over-represented in the preserved cuttings.

is present at an average of Claimed as PBI Table 2-6a presents a summary of these data. The analytical results are presented in Appendix B.2.

The Fleming Sand 3 isochore map is presented on Figure B-21 and shows a gross interval thickness of approximately 1,000 to 1,115 ft thick within the AoR. A review of the stratigraphic well data indicated that the Fleming Sand 3 is composed of predominately unconsolidated, very fine to fine-grained, subrounded to rounded, moderate to well sorted quartz sandstone with occasional calcareous cement (concretions). Sandstone is interbedded with mudstone that is predominately hard, bulky, slightly silty, and calcareous with trace marl. Interbedded shale increases with depth and grades into the Anahuac Shale. A review of the core data from the stratigraphic well indicated similar properties based on descriptions of very fine to medium-grained laminated sandstone being present.

Mineralogy data from XRD analysis of 31 samples from the Fleming Sand 3 were reported from depths 5,194 to 5,230.2 ft in the stratigraphic well. A review of the results indicated that the samples contained an average of Claimed as PBI quartz, with total clays averaging Claimed as PBI Potassium feldspar comprises an average of Claimed as PBI in these samples, with plagioclase present at an average weight percent of Claimed as PBI Kaolinite was present at an average of Claimed as PBI within the samples and illite/smectite exhibited an average of Claimed as PBI Table 2-6a presents a summary of these data and the analytical results are presented in Appendix B.2.

The Fleming Sand 3 was described as a moderately-well sorted, fine to medium-grained sandstone with abundant primary intergranular porosity. Secondary inter- and intra-granular porosity is common. Grains are subrounded to angular and are composed primarily of quartz and feldspar (plagioclase and K-feldspar) with volcanic rock fragments and other lithic grains (brown) being commonly observed. Heavy minerals and fossil fragments are rare. Planktonic foraminifera suggest deposition in a marine setting. Plagioclase and rock fragments are commonly observed altering to clay minerals (kaolinite and chlorite). Grain coating clays are present and appear to be inhibiting quartz overgrowth cementation. Thin section photographs for the Fleming Sand 3 are included in Figure B-28a, Appendix B.2 and discussed in more detail below. The net sand thickness map of the Fleming Sand 3 interval is presented on Figure B-22 and estimates the net sand thickness range to be approximately 420 to 790 ft within the AoR.

Continuous shale interbeds occur between the Fleming Sand packages and were identified as Fleming Shales 2 and 3. These shale beds are consistent with baffles that restrict vertical movement of the CO2 plume and significantly reduce the potential for vertical formation fluid migration within the Fleming injection intervals. Based on the data from the stratigraphic well, the Fleming Shale 2 is green to reddish brown, moderately hard, blocky to sub-blocky, and calcareous with a waxy texture. The formation has trace interbedded quartz sandstone that is disaggregated to firm, medium to fine grained, subrounded, moderately sorted with calcareous cement (concretions) and trace pyrite. The Fleming Shale 3 is a greenish grey to reddish brown and dark grey, moderately hard, blocky, slightly silty, slightly calcareous shale with trace marl. Interbeds of siltstone are firm and calcareous. Interbedded quartz sandstone is firm, very fine to fine grained, and subrounded with calcareous cement (concretions) and dark lithic inclusions.

The Fleming 3 Sand exhibited porosities ranging from Claimed as PBI with permeabilities ranging from Claimed as PBI (Appendix B.1 and B.2).

2.5.6.2 Upper Frio Injection Interval

The Upper Frio injection interval is comprised of Upper Frio Sands 1 and 2 as shown on the Bead Farm Co. #1 type log, Figure B-23. The primary sands in the Upper Frio provide ample CO2 storage capacity. The Frio Formation open hole log from the stratigraphic well is presented on Figure B-23 and identifies the interpreted formation tops utilized in this discussion concerning the Frio injection interval. The Upper Frio Sand 1 occurs from the base of the Anahuac Shale (top of the Upper Frio) down to the base of Upper Frio Sand 1. Upper Frio Sand 2 occurs from the top of Upper Frio Sand 2 to the base of the injection zone (top of LCZ). Figure B-23 presents open hole logs within each of these intervals at Bead Farm Co. #1 and interpreted sand intervals within the Upper Frio Sand 1 exceed those of the Upper Frio Sand 2. The Upper Frio Sands 1 and 2 are continuous throughout the AoR, as shown on Figures B-12 and B-13, with varying net sand thickness within each sand interval.

The Upper Frio Sand 1 isochore map is presented on Figure B-24 and shows the gross interval thickness including both the shales and sands to be approximately 1,100 to 1,170 ft thick within the AoR. The Upper Frio Sand 1 net sand thickness is presented on Figure B-25 and was estimated to be approximately 490 to 770 ft thick within the AoR. Analysis of the mud logging data from the stratigraphic well indicated that the Upper Frio Sand 1 is composed of firm to moderately hard, very fine to medium grained, subrounded to rounded, moderately sorted quartz sandstone with argillaceous cement. The Frio Sand 1 is interbedded with moderately hard, sub-blocky to blocky, silty, moderately calcareous shale.

The core data descriptions are similar, designating the core as primarily medium-grained sandstone that is moderately to well sorted, sub-angular, and blocky near the base of each laminae. Mineralogy data from XRD analysis of six samples ranging from 7,275 to 7,302 ft in the stratigraphic well (Table 2-6a) and indicated the samples contain Claimed as PBI quartz mineralogy. Total clays are Claimed as PBI or less in these samples. Potassium feldspars are approximately Claimed as PBI of the samples, plagioclase is approximately Claimed as PBI with minor kaolinite Claimed as PBI and illite/smectite up to Claimed as PBI.

XRD sample analyses were performed on stratigraphic well samples collected from the Upper Frio Sand. A total of 48 samples within the 7,255.7 to 7,304.1 ft depth interval were collected. These samples indicate the sampled intervals of the Upper Frio Sand contain an average of Claimed as PBI quartz, with total clays averaging Claimed as PBI Potassium feldspar comprises an average of Claimed as PBI in these samples, with plagioclase present at an average weight percent of Claimed as PBI Kaolinite is present at an average of Claimed as PBI within the samples, and illite/smectite exhibits an average of Claimed as PBI Table 2-6a presents a summary of these data and the full XRD analytical results are presented in Appendix B.2.

Thin section photographs for the Upper Frio Sand 1 are shown on Figure B-28b. This Figure shows the white light in photo A on the left, and polarized light in photo B on the right in order to identify different features. The section shown in Figure B-28b is described as a moderately well sorted, fine to medium grained-sandstone with abundant primary intergranular porosity. Secondary inter- and intra-granular porosity is common. Grains are subrounded to angular and are composed primarily of quartz and feldspar (plagioclase and K-feldspar) with volcanic rock fragments and other lithic grains (brown) being commonly observed. Heavy minerals and fossil fragments are rare. Plagioclase and rock fragments are commonly observed altering to clay

minerals (kaolinite and chlorite). Grain coating clays are present and appear to be inhibiting quartz overgrowth cementation.

The Upper Frio Sand 2 isochore is presented on Figure B-26 and includes the gross interval of both shales and sands, approximately 640 to 860 ft thick within the AoR. The net sand thickness is presented on Figure B-27 and provides the estimated net sand thickness to be approximately 70 to 310 ft within the AoR.

Frio Shale 2 is a continuous shale bed that is approximately 90 to 140 ft thick within the AoR and occurs between the Upper Frio Sands 1 and 2. This shale bed is within the Frio injection interval and will act as a baffle that reduces the potential for vertical movement of the CO2 plume into overlying injection intervals. In addition, the Frio Shale 2 will help influence laminar flow conditions in the Upper Frio Sand 2. Thin sections of the Frio Formation were available from core taken from the Broussard Trust-1 (API 4224501690). The available data include thin section photographs (Figure B-28c) and XRD data (Table 2-6b). A review of these data indicated that the Upper Frio injection interval sampled from the Broussard Trust-1 is quartz dominated with notable amounts of clays present (primarily illite and smectite). Minor amounts of potassium felspar and plagioclase were also identified in the samples. Calcite is also present in the two lowermost samples. Figure B-28c also shows abundant quartz content with effective porosity apparent (Depths 7,743 and 7,760 ft), and also presents stratigraphic features, including presumed clay cross-beds (e.g., Depth 7,725 ft). Based on the XRD data from Bead Farm Co. #1 (Table 2-6a), the higher-clay content sections are likely shale stringers. The target injection intervals in the Upper Frio are, on average, expected to be predominately quartz with minor clays present. The results of reaction-path geochemical modeling described in section 2.9 predict less than less than Claimed as PBI clay dissolution/precipitation. Based on these model predictions, we do not expect a material impact, either chemically or mechanically, of the clay's interactions with the injectate. As such, no additional actions have been taken or are accounted for in the reservoir formations.

Overall, the data and analyses for the stratigraphic well support a finding that the local injection zone thicknesses, depths, and mineralogical composition generally conform to regional information and site-specific porosity and permeability data were obtained. Porosity and permeability data were obtained from analysis of the Frio Sands at the stratigraphic well. The local porosity ranged from Claimed as PBI within the cored Frio interval and the permeability of sample rock ranged from Claimed as PBI (Appendix B.2).

2.5.7 Geologic Characteristics of the Confining Zones

The UCCZ occurs immediately above the Fleming injection intervals. The geological characteristics of the UCCZ are consistent with the requirements of 40 CFR 146.82(a)(3)(iii) for confining the CO2 plume and acting to protect USDWs from endangerment. Although not relied upon as the primary confining zone, the Anahuac Shale within the injection zone offers additional CO2 plume confinement features for the Upper Frio injection interval. Beneath the Upper Frio injection interval is the LCZ, characterized as a thick marine shale. The following discussion presents the available evidence of the confining properties of the UCCZ, Anahuac Shale, and LCZ. Local well logs, literature sources, and stratigraphic well findings were utilized to assess geologic characteristics of the confining zones.

2.5.7.1 Upper Composite Confining Zone

The UCCZ is a muddy (shaly) interval from the top of the UCCZ to the top of the Fleming Sand 1. This shale-prone interval is identified on Figure B-29 as the top of the UCCZ to the top of the Fleming injection interval (top and base of UCCZ, respectively). A review of available information indicated that the UCCZ was regionally deposited in response to a higher-order flooding event, shown in well logs on Figures B-12 and B-13. Based on a review of the mud logging data for the stratigraphic well, the UCCZ is composed of predominately shale that varies in color between brown, reddish brown, light green and light grey. The formation contains isolated very fine to fine grained, moderately sorted quartz sandstone interbeds. Core data are similar describing good claystone and mudstones, up to very fine-grained siltstones. The shale volume of the UCCZ is approximately [redacted], providing an effective confining zone.

XRD sample analyses from the UCCZ, ranging in depths from 3,093.6 to 3,202.05 ft, were performed and are summarized in Table 2-6a. The data are included in Appendix B.2. A total of 40 samples were analyzed showing an average quartz [redacted] and a total clay content of [redacted] Potassium feldspar averaged [redacted] from this dataset, with plagioclase averaging [redacted] Kaolinite is present at an average of [redacted] and illite/smectite exhibiting an average of [redacted]

Thin section photographs for the UCCZ are shown on Figure B-28d and included in Appendix B.2. Figure B-28d is described as bioturbated, Miocene-aged mudstones at 3,174 ft taken under plane polarizing light. It shows silt-sized quartz and feldspar grains embedded in a clay-rich matrix with dispersed framboidal and pore-filling pyrite cements. Other grain types frequently observed include micaceous minerals, glauconite, and fossil fragments. Organic matter is also common. Figure B-30 illustrates the isochore map of the UCCZ and its lateral continuity over the AoR. The estimated gross thickness of the UCCZ is approximately 360 to 490 ft within the AoR.

A net shale map was constructed using the VShale log curve created from available log data (Figure B-31). As shown, the estimated net shale thickness is approximately 310 to 420 ft within the AoR. These ductile shales are interpreted to be similar in composition to fine-grained sedimentary rocks deposited in many clastic basins, consisting of clay-rich mixtures (smectite and illite), with variable amounts of quartz, feldspar, kaolinite, and chlorite (Totten et al., 2002).

Literature sources cite the potential for these shales to be either Type A or B Seals and will serve as flow barriers, as they are described to have a high degree of impermeability relative to hydrocarbon movement (Sneider, 1995). A Type A Seal estimates that a 35-degree API oil column will be trapped by a shale thickness from greater than or equal to 1,000 ft to less than 5,000 ft. A Type B Seal estimates that a 35-degree API oil column will be trapped by a shale of greater than or equal to 500 ft to less than 1,000 ft (Sneider, 1995).

2.5.7.2 Anahuac Shale

While the Anahuac Shale is not considered as a confining zone for the Project site, it is an effective boundary separating the Upper Frio injection interval from the Fleming injection intervals. The Anahuac Shale will contain injected CO2 in the Upper Frio injection interval for the reasons outline below. The Anahuac Shale overlies the Upper Frio Formation and confines the Upper Frio injection interval. A segment of the stratigraphic well log across the Anahuac Shale is presented on Figure B-32. The Anahuac is a regional shale unit that is thick and

continuous across the AoR as shown on Figures B-12, B-13, and the isochore map shown on Figure B-33.

A review of the mud logging data from the stratigraphic well indicated that the Anahuac Shale is firm to moderately hard, sub-blocky to blocky, silty, and very calcareous. The composition of the Anahuac Shale is primarily illite and smectite. The Anahuac Shale thickness is approximately 410 ft at the stratigraphic well as verified by geophysical logs and supported by the mud log data. Core descriptions describe similar laminated silts to clays throughout with some ripples and various trace fossils. Figure B-34 presents the net shale map using the VShale approach, which estimates the Anahuac Shale net thickness to approximately 400 ft near the injection wells.

XRD sample analyses of the Anahuac Shale, ranging in depth from 6,266.6 to 6,302.1 ft, were performed from the E24C data set and are summarized in Table 2-6a and contained in Appendix B.2. Twelve samples were analyzed showing an average quartz Claimed as PBI and a total clay content of Claimed as PBI consistent with the mineralogy of a confining shale. Potassium feldspar averaged Claimed as PBI from this dataset, with plagioclase averaging Claimed as PBI Kaolinite is present at an average of Claimed as PBI and illite/smectite exhibiting an average of Claimed as PBI

2.5.7.3 Lower Confining Zone

Figure B-35 presents the type log from Walter Co - 1 (API 4224531725), which displays data beneath the Upper Frio injection interval, i.e., the LCZ. The Walter Co - 1 was drilled several thousand ft into the Frio. Few wells in the Project area were drilled into and beneath this section as it underlies most hydrocarbon production, but a review of the available data shows that the LCZ is thousands of feet thick. As shown on the log on Figure B-35, thick and pervasive shales below the Upper Frio injection interval at the Walter Co - 1 well extend over 3,500 ft below the base of the injection zone. The stratigraphic well was drilled into the upper 165 ft of the LCZ and the well reached total depth within the uppermost portion of the LCZ.

2.5.8 Local Geologic Structure

The local geologic structure was interpreted using a combination of analyses of 2D and 3D seismic data as well as historical log data. The location of two representative 2D lines extracted from the 3D survey and the wells that were utilized for the well ties is presented on Figures B-11a and 11b. The seismic line perpendicular to dip is sourced from the 3D Southwest Beaumont survey and is presented on Figure B-36. The seismic line parallel to dip is shown on Figure B-37. The results of the local geologic analysis are consistent with the regional geology in terms of formation structure orientation. The seismic data were utilized to create both structure contour maps of the relevant surfaces and to interpret faults within and surrounding the AoR.

2.5.8.1 Upper Composite Confining Zone

The UCCZ consists of a fine-grained, muddy interval that includes the Amph ‘B’ Shale marker. A structure map constructed at the top of the UCCZ is shown on Figure B-38. The top of the UCCZ occurs at approximately 2,840 to 3,110 ft below mean sea level (BMSL) near the stratigraphic well and proposed injection wells, based on the stratigraphic well data. The top of the UCCZ at the stratigraphic well was contacted at 2,922 ft BMSL. As shown on Figure B-38, the dip is generally toward the south across the Project area.

2.5.8.2 Fleming Injection Intervals

Figure B-39 presents a structure map for the top of the Fleming injection intervals. The top of the Fleming Formation is estimated to occur at approximately 3,240 ft BMSL to 3,500 ft BMSL within the AoR. The top of the Fleming injection interval at the stratigraphic well was contacted at 3,460 ft BMSL. The dip is generally toward the south across the area.

2.5.8.3 Anahuac Shale

The Anahuac Shale consists of a thick shale underlying the Fleming injection intervals and overlying the Upper Frio injection interval. Figure B-40 provides a structure map of the top of the Anahuac Shale. The top of this shale bed is estimated to occur at approximately 5,680 to 6,210 ft BMSL within the AoR. The Anahuac Shale was contacted at 6,054 ft BMSL at the stratigraphic well. The dip is generally toward the south across the area.

2.5.8.4 Upper Frio Injection Interval

The structure map for the Upper Frio injection interval (Figure B-41) illustrates the top of the Frio at an estimated depth of 6,050 to 6,600 ft BMSL within the AoR. The top of the Frio injection interval at the stratigraphic well was contacted at 6,463 ft BMSL. The dip is generally toward the south across the area.

2.5.8.5 Lower Confining Zone

The LCZ top coincides with the base of the injection zone. The LCZ shales are several thousand feet thick. The proposed depths of the injection wells terminate above the LCZ. The structure map of the top of the LCZ is shown on Figure B-42. The top of this surface is estimated to be contacted at approximately 7,920 to 8,650 ft BMSL within the AoR. The top of the LCZ at the stratigraphic well was contacted at 8,432 ft BMSL. As shown on Figure B-42, the dip is generally toward the south across the area.

2.5.9 Seismic Data

Legacy 2D and 3D seismic data were obtained and licensed by ExxonMobil. The acquisition dates of these surveys range from the 1990s to the 2000s, with reprocessing by the seismic vendor of the 3D seismic data performed in prior to licensing by ExxonMobil. Approximately 1,812 square miles of data were reprocessed in 2013 and approximately 1,252 square miles of data were reprocessed in 2017. These data were combined to make the Alligator West 3D survey and a portion of the combined survey was used to support site geologic interpretation. In addition, the Southwest Beaumont 3D survey was also licensed. This survey was reprocessed in 2008. The seismic data quality of the surveys is suitable for the characterization of geologic structure and other features summarized in this document.

2.5.9.1 Velocity Control and Synthetic Seismogram

The wells that contained enough data to perform a well tie (i.e., tie the seismic survey to depth and allow correlation of historical well logs to seismic data) are the Walter Co - 1 (API 4224531725) and Walter Company - 2 (API 4224531452) wells. In addition, the stratigraphic well data were used to perform a well tie of the seismic data. The results of the Walter Co - 1 are shown on Figures B-43a and B-43b. The Walter Company - 2 well tie is shown on Figure B-44a, respectively. The well tie performed for the stratigraphic well are shown on Figure B-44b. Time--depth relationships were generated from the sonic log for each well of the Walter wells

and both wells offered quality ties for the purposes of geologic characterization at the Project site. The results of depth-migrated seismic data with well log overlays are displayed on Figure B-45 that present the locations of the Broussard Trust-1, the stratigraphic well, and Broussard JE Jr-1 wells along a representative seismic line. Good quality well ties, as discussed in this section, present a good conversion of the seismic data from time to depth, allowing for a quality comparison between well data and seismic data.

2.5.9.2 Interpreted Structural Features – Faults

Based on the review of the seismic data, four interpreted normal faults were identified in the AoR. Maximum fault displacements for these faults are presented in Table 2-7. This table outlines the maximum displacement at the UCCZ, Anahuac Shale, and also identifies the maximum displacement of the fault with the corresponding formation at that depth. The discussion below provides a summary of the evaluation of seismic data and finds that displacement within the UCCZ and Anahuac are not significant for the confining properties of these zones.

The seismically-mapped fault locations are presented on Figures B-38 through B-42 and illustrate where the faults extend through the relevant formations within the AoR. Four of these faults are discussed in detail within this section. As shown on Figures B-38 through B-42 and Table 2-7, three of the four faults within the AoR do not transect the UCCZ – only the fault labeled “Fault 2_2” is present at the top of the UCCZ. Detailed seal analyses were conducted for the four faults to assess whether the faults could potentially impact the confining properties of the UCCZ.

Shale gouge ratio (SGR) calculations to predict the fault seal quality were performed on the faults within the AoR. The methodology selected for the SGR analysis is based on Yielding et al. (1997), calculated using Equation 1, which utilizes the zone (lithology) thickness (h), clay fraction (VShale, estimated from SP log), and the fault displacement (fault throw). Calibrations were based on subsequent methods provided by Manzocchi et al. (1999) and Sperrevik et al. (2002).

Manzocchi et al. (1999) used numerical and analytical models based on geologic concepts to predict fault zone transmissibility and showed that in realistically heterogenous fault zones fluid flow is tortuous due to a lack of intra-fault conduits. These results suggest that fault transmissibility can be estimated using empirical relationships between fault permeability, shale gouge ratio (Yeilding et al. 1997), fault thickness and throw, but that actual constraints from representative fault zones were needed for model refinement. Building on Manzocchi et al. (1999), Sperrevik et al. (2002) used fault and host rock core measurements to derive empirical relationships between seal threshold pressure and fault permeability as a function of shale content, fault thickness and depth. Note that as calculated SGR values are representative of shale content within a fault zone.

Both Manzocchi et al. (1999) and Sperrevik et al. (2002) constrain fluid flow simulations using fault rock properties in siliciclastic sequences and heterogenous fault zones analogous to those in the project area and provide a framework for using SGR values to inform fault seal and permeability analyses. While the equations of these two approaches take slightly different forms, their estimations of permeability and seal threshold pressure as a function SGR are broadly similar. In summary, SGR (clay content) values of 0.2 (20%) yield Hg-Air Threshold

pressures (mercury injection capillary pressure [MICP]) of approximately 100 psi and SGR (clay content) values of 0.5 (50%) yield Hg-Air Threshold pressures (MICP) of approximately 200 to 1,000 psi. We consider these latter values to represent high quality seal properties.

These calibrations conclude that permeability along the fault is approximately 0.01 millidarcies or less with at least 50% clay fraction (VShale).

$$SGR = \frac{\Sigma(h * VShale)}{Fault\ Throw} \qquad Equation\ 1$$

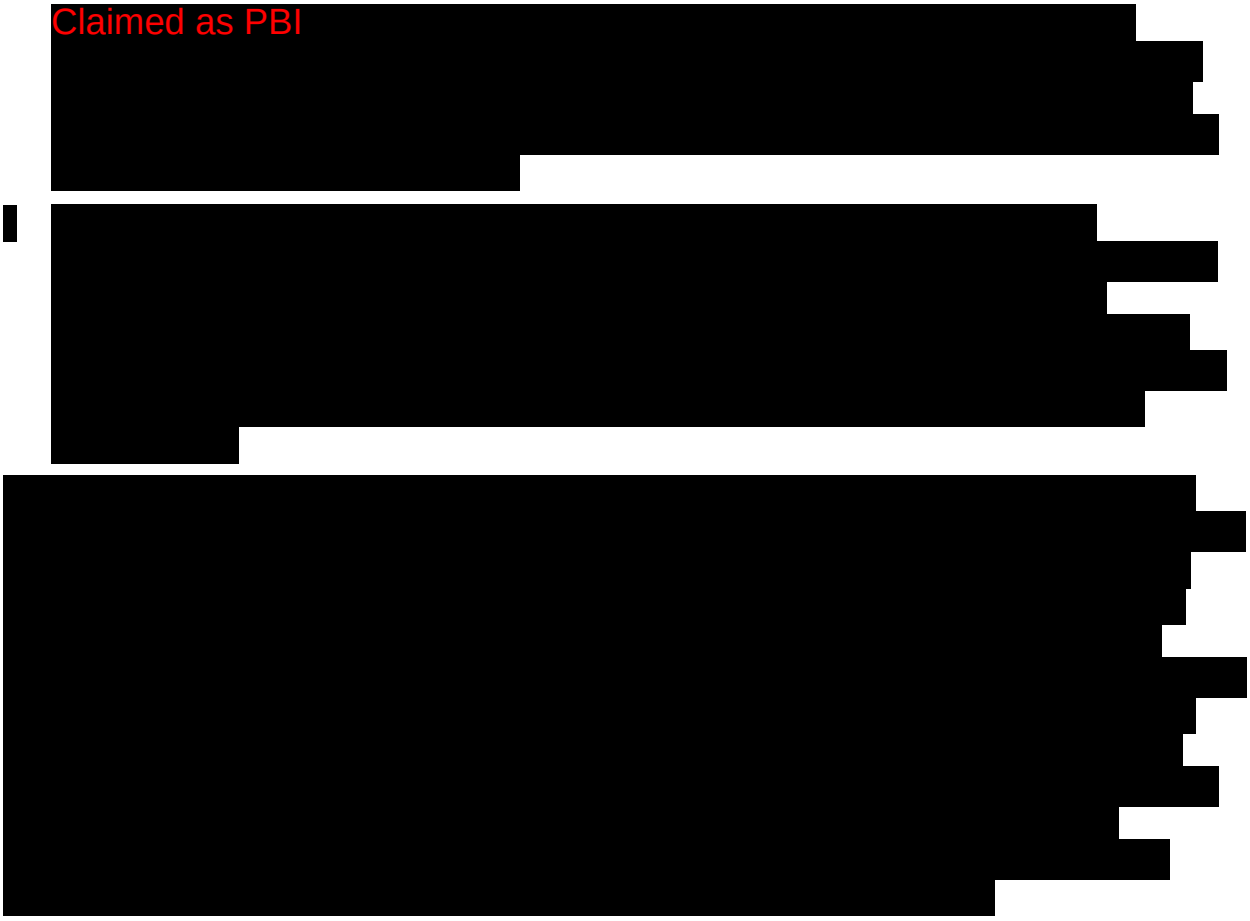
Claimed as PBI

[redacted]

Claimed as PBI

[redacted]

Claimed as PBI



As previously discussed in this document, ExxonMobil has drilled a stratigraphic well in the AoR (Bead Farm Co. #1). Analysis of the available core and log data from the stratigraphic well indicate no significant presence of structural features or structural complexity (see Appendix B.5).

2.5.9.3 Interpreted Structural Features – Fractures

As previously discussed, ExxonMobil drilled the Bead Farm Co. #1 as a stratigraphic well in the AoR. This data collection program for the stratigraphic well included extensive coring, logging, and testing to obtain geologic, geomechanical, hydrologic, and other data pertinent to confirming injection zone and confining zone suitability. Evidence of fracture development was assessed by examining imaging eight slabbed cores, core computed tomography, or borehole imagery logs and core data from the stratigraphic well. Over 320 ft of conventional core were recovered and a detailed analysis of the core is presented in Appendix B.5, with a summary below:

- The natural structural features observed in the stratigraphic well core are predominantly non-tectonic pedogenic slickensides that form due to soil processes and sediment compaction, an expected feature of paleo-vertisols;
- No natural fractures, stylolites, deformation bands, or significant faults were observed in the core samples;

- A single minor (sub-seismic) fault was documented in one core sample from the Anahuac Shale (Core 7 from 6,266 ft to 6,302 ft Kelly Bushing [KB]);
- Planar features measured in borehole imagery are randomly oriented, providing further evidence of a non-tectonic origin;
- No significant risk of high permeability pathways along natural faults and fractures is predicted from this analysis;
- No significant risk of elevated permeability associated with the pedogenic slickensides is predicted because these are original structures expected to be ubiquitous in similar clay-rich intervals; and
- The finding of no significant permeability is consistent with the occurrence of trapped hydrocarbons in these structural features documented across the Gulf Coast and no evidence of any formation fluid transmission was observed in the cores.

2.5.9.4 Uncertainties and Limitations in the Available Data

During the evaluation of the available 2D and 3D seismic data, some uncertainties and limitations naturally arose regarding the potential for faults and fractures to be present within the AoR that could, potentially, contribute to the vertical transmissivity of CO2 or displaced formation fluids to the lowermost USDW. As discussed below, ExxonMobil possesses a high degree of confidence in the suitability of the analysis performed and anticipates that additional site characterization should not entail major revisions to the site characterization.

The local geologic setting is well-suited to the confident application of the SGR method to quantify fault seal because key geologic data requirements of the SGR method are locally met:

1. During fault movement, the stratigraphic section was relatively unlithified. This allows for both the entrainment of low-permeability shale into the fault zone and precludes the preservation of open fractures along the fault zone. The geologically young Gulf Coast stratigraphy is relatively unlithified at present and would therefore have been unlithified during any past fault motion.
2. An appropriate calibration of SGR to fault seal and permeability is available. While a specific local calibration is not available, the SGR approach was developed and calibrated within globally analogous geologic settings. To address the lack of local calibration, ExxonMobil applied a conservative scaling of SGR to seal development. A higher SGR value corresponds to better fault seal development. For example, ExxonMobil limited seal development to SGR values greater than 0.5 while published calibration expects the onset of seal development at SGR greater than 0.2.
3. The well-based stratigraphy used in the SGR calculation is representative of the stratigraphy directly adjacent to the faults under consideration. Several well logs are available within the area of interest, the nearest being within 0.25 miles of the analyzed faults under consideration. In addition to leveraging the nearest well, the stratigraphy from a selection of other local wells was used to constrain allowable ranges of near fault stratigraphic character. Importantly, key identified top seal (i.e., UCCZ and the Anahuac Shale) intervals are stratigraphically continuous across the region and therefore are present in all of the local wells.

4. Fault architecture is described adequately to identify relevant features and accurately characterize fault throw. Available seismic data are sufficient to identify and characterize significant faults within and surrounding the AoR. One general observation is that greater amounts of fault throw correspond to more likely potential to impact the upper confining zone. ExxonMobil factored in a 25% uncertainty margin on the fault seal analysis throws to acknowledge mapping uncertainties. Additionally, smaller faults that are not identifiable on the available seismic surveys do not pose an additional seal uncertainty above the major faults because they host lesser amounts of stratigraphic offset (throw) by default.

2.6 Geomechanics and Petrophysics

The information discussed in this section is from existing sources, such as publications and offset well data. Well data from the Bead Farm Co. #1, Walter Co - 1, Broussard Unit-1, and Eleanor-1 are used to estimate the local stress conditions, elastic moduli, and fracture gradients of the injection and confining zones.

2.6.1 Local Stress Conditions

The World Stress Map is a "global compilation of information on the crustal present-day stress field maintained since 2009 at the Helmholtz Centre Potsdam GFZ German Research Centre for Geosciences." The associated website presents the compiled regional stress data, including that for the Project region as shown in Figure B-50. Based on a review of Figure B-50, the estimated maximum horizontal stress orientation is East-Northeast at approximately 80 degrees, approximately parallel with the coast. A normal faulting stress regime is inferred based on the 2016 World Stress Map.

Vertical stress was characterized primarily using bulk density logs from offset wells. Since bulk density data are not readily available for formations shallower than 2,000 ft measured depth, an assumed bulk density value was used for this interval using a best fit curve from the underlying bulk density. Claimed as PBI [redacted]

The minimum horizontal stress, which will be utilized to estimate the fracture gradient, was estimated using two processes: 1) calculate a Poisson's Ratio using available dipole sonic log data; and 2) use Eaton's equation to estimate minimum horizontal stress. ExxonMobil obtained dipole sonic log data from Bead Farm Co. #1 where the compressional slowness (t_p) and shear slowness (t_s) log data are used in Equation 2 to calculate Poisson's Ratio:

$$\nu = \frac{0.5\left(\frac{t_s}{t_p}\right)^2 - 1}{\left(\frac{t_s}{t_p}\right)^2 - 1}$$

Equation 2

An example using the following input parameters, shown in Table 2-9, were used in Equation 2 at a depth of 3,644 ft KB (within Fleming Sand 1).

Using the input values from Table 2-9, the resulting Poisson's Ratio is equal to Claimed as PBI [redacted].

Minimum horizontal stress is calculated using Eaton's equation, shown in Equation 3 where ν is Poisson's Ratio, S_V is the vertical stress, P_p is the pore pressure Claimed as PBI [redacted]

Claimed as PBI While parameter C is a constant for calibration with available offset data.

$$S_{hmin} = \frac{v}{1-v}(S_V - P_p) + P_p + C \qquad \textit{Equation 3}$$

Input parameters, shown in Table 2-10, were used for Equation 3 at a depth 3,644 ft KB within Fleming Sand 1.

The resulting minimum horizontal stress using the input values in Table 2-10 is equal to Claimed as PBI . Note that the calibration is performed with available formation integrity test in offset wells as well as the step rate tests (SRT) conducted in Bead Farm Co #1. Additional information regarding the SRT data and analyses are discussed in Appendix B.3.

Claimed as PBI

2.6.2 Elastic Moduli, Strength, and Ductility

Dynamic Young's modulus E_{dyn} was calculated using shear wave velocity and the Poisson's ratio v as follows.

$$E_{dyn} = 2\rho V_s^2(1+v) \qquad \textit{Equation 4}$$

where ρ is rock density and V_s is the shear wave velocity. Claimed as PBI

A linear dynamic to static transform was used to convert dynamic Young's modulus into static Young's modulus is shown in Equation 5.

$$E_{sta} = \mathrm{k}E_{dyn} \qquad \textit{Equation 5}$$

where k is a simple scaling factor. Based on laboratory testing by Zhang et al. (2019) and ExxonMobil's in-house testing with samples from Bead Farm Co. 1 (Table 2-12b), a uniform scaling factor of k equal to 0.70 was used for all formations. An example of the workflow utilizing density and sonic logs to calculate Poisson's Ratio and the Young's modulus are shown on Figure B-52a. The average elastic moduli in the proposed injection zone are summarized in Table 2-12a, Claimed as PBI

Triaxial compression tests have been performed on core samples taken from Bead Farm Co. #1 to measure elastic properties and shear strength of the injection interval and the seal. The results are summarized in Table 2-12b.

There have been many proposed methods to characterize the ductility/brittleness of rocks. Grieser and Bray (2007) and Fisher et al (2023) utilized the cross-plot between Young's

modulus and Poisson's ratio to characterize ductility. Rock samples with low Young's modulus and high Poisson's ratio will be described as more ductile. Another approach to determine ductility is to analyze the shape of stress-strain curves during triaxial compression tests (Gutierrez, 2022). Samples exhibiting large plastic strain after initial yield, or samples not showing large stress drop after peak strength are considered more ductile. As shown in Figure B-52b, shale samples from Bead Farm Co. #1 all cluster near the lower right corner of the Young's modulus / Poisson's ratio cross-plot, therefore may be characterized as highly ductile. In addition, the stress-strain curve of an Anahuac shale sample experienced approximately 1% of plastic strain at peak strength and no sharp stress drop was observed afterwards. All these observations suggest that the shale samples at Rose CCS site can be characterized as ductile. On the other hand, ductility of the sand samples may be close to the brittle-to-ductile transition range.

2.6.3 Injection Zone Fracture Gradient Calculation

As discussed in Section 2.6.1 – Local Stress Conditions, Eaton's equation was used, [redacted], to estimate the minimum horizontal stress in both sand and shale and guided the estimate of the injection zone fracture gradient. Claimed as PBI [redacted] Table 2-13. The range of values identified in Table 2-13 Claimed as PBI [redacted] The SRT analyses are presented in Appendix B.3.

2.6.4 Confining Zone Fracture Gradient Calculation

Similarly, fracture gradients in the confining zone can also be evaluated from Figure B-51. The calculated average values are shown in Table 2-14, where the fracture gradient is estimated at Claimed as PBI [redacted].

2.6.5 Maximum Injection Pressure Calculation

40 CFR 146.88(a) requires that the maximum bottomhole injection pressure must not exceed 90% of the fracture pressure of the injection zone to reduce the potential for existing fractures to propagate during normal operations. Using the estimated formation tops presented in Table 2-4, the estimated maximum bottomhole injection pressures for the injection wells, for the top of the Fleming injection intervals and the top of the Upper Frio injection interval, are shown in Table 2-15. Conservative values of Claimed as PBI [redacted] were used for the Fleming Sands and Claimed as PBI [redacted] was used for the Upper Frio Sands based the site-specific data presented in Section 2.6.3 – Injection Zone Fracture Gradient Calculation. Note that the estimated injection pressure limits are higher than the maximum injection pressures forecasted by the dynamic models described in Section 3 – Area of Review and Corrective Action Plan. Therefore, they are not limiting factors for injectivity and capacity estimates for the project.

2.6.6 Capillary Pressure Data

The sealing capacity was estimated by MICP measurements performed on core samples that represent a range of sedimentological and mineralogical variation encountered in the cored interval of the stratigraphic well. Capillary threshold pressure (P_{cth}) is the critical pressure at which a nonwetting fluid, in a continuous flowing phase, may displace a wetting-phase fluid from the pore space. For core MICP measurements, this is the pressure at which the percentage of nonwetting mercury volume increases rapidly depending on the rock's pore throat distribution. It implies the capillary force available to hold the buoyancy force of a fluid and is directly proportional to seal quality. MICP P_{cth} for available analog core material was performed using the Thomeer-hyperbola method which enables objective determination of capillary threshold pressure (Thomeer, 1960). P_{cth} is typically a small number for permeable sand but is important to include in the rock property description and simulation model. Porosity and permeability were also estimated from mercury injection data. In this study, rocks of different reservoir quality are binned into five sets based on permeability range. An analytical report for the capillary pressure data of the UCCZ, Fleming Shale 1, and Anahuac Shale is included in Appendix B.2.

The capillary entry pressure P_{cth} values for each bin of rock type is represented in Table 2-16a. Table 2-16b presents the results for samples collected from the Fleming and Frio sands. Table 2-16c presents the results for samples collected in the UCCZ, Fleming 1 Shale, and Anahuac Shale.

2.7 Evaluation of Surface Air and Soil Gas Monitoring Data

At this time, no surface air or soil gas CO2 concentration data were collected or evaluated because a loss of CO2 containment in the injection intervals is not considered to be a reasonably probable occurrence. Instead, these are treated as triggered baseline and operational requirements should the threat of leakage be identified during and/or after the operational phase of the Project.

2.8 Reservoir Characterization and 3D Geologic Modeling

Characterization of the Fleming and Frio Formations was carried out within the confining and injection zones to develop an understanding of the sealing effects of the confining zone and characterize the reservoir heterogeneity within the injection zone. Based on the analysis and understanding of the Project area, a 3D geologic model was developed to estimate the storage potential for the CO2 and evaluate its confinement, both laterally and vertically.

2.8.1 Geologic Model of the AoR

Using available data, an integrated geologic model was developed for the site to represent the structural setting and depositional environment, as well as distribute petrophysical properties within the model boundaries. This model provides a 3D grid to enable predictive CO2 plume and pressure modeling over time. Available site data used to inform the 3D geologic model includes seismic surveys, stratigraphic well data, and legacy well logs, such as SP (original log for volume of shale, used in most of the VShale calculations), gamma ray logs (another lithologic log that can also be used to calculate VShale, used sparingly in this geologic model), resistivity, bulk density (density porosity), and sonic logs (sonic porosity). The geologic model incorporates regional core data, log, and seismic data to characterize structural configuration, net sand, facies and property distribution, and porosity-permeability relationships.

Log properties were upscaled to model resolution and populated in a 3D grid over an area that exceeds the spatial limit of the AoR. Claimed as PBI [redacted]

The geologic model includes the following information from the stratigraphic well, resulting in a refined geologic characterization of the storage and confining features of the through rock compressibility measurements, geothermal gradient measurements, porosity and permeability measurements from core and NMR data, and salinity and reservoir fluid composition from fluid samples.

2.8.2 Structural Model

Seismic interpretation was carried out using 3D seismic data within and surrounding the AoR. In addition, several 2D seismic lines are present in and around the AoR, which were also used to further characterize the area (Figure B-11a). The fault framework model was built with 17 interpreted faults within the geologic model study area and zones of interest, four of which are located inside the AoR as detailed in Section 2.5.8.2 – Fleming Injection Intervals.

The structure model captures the throw relationships that were interpreted in the seismic data. No impediment to CO2 flow was imposed where sand-on-sand juxtaposition across a fault plane occurs. In case of sand-on-shale juxtaposition, the shale would act as a barrier and restrict flow across the fault. Figure B-53a shows relative offsets of injection and confining zones across some of the faults in 2D view, which was extracted from the 3D model. Consistent with Section 2.5.9.2 – Interpreted Structureal Features – Faults, four faults were identified and characterized within the AoR. These faults do not pose a significant threat to USDW because the faults were shown to not exhibit significant transmissive potential for CO2 or fluids, the displacements are of limited extent within the confining zones, and they do not offset the confining zones. Figure B-53a shows that the model identifies no significant offset between the Fleming sands and no significant faults that could reduce the confining properties of the UCCZ.

The horizon model was built using seven mapped seismic horizons and five additional surfaces created from well tops. The well data suitable to assign interpreted formation tops were used to tie the seismic data for formation depths. Figure B-53a shows the resulting model cross section that runs approximately east to west through one of the planned injection wells, the stratigraphic well (Bead Farm Co. #1), and Broussard Trust-1 legacy well; the resulting 3D structural grid is shown on Figure B-53b. This cross section (Figure B-53a) depicts the confining and injection zones within the AoR. The injection intervals are shown and the UCCZ, with the interbedded shales in the Fleming and Upper Frio, as well as the Anahuac Shale, are shown in shades of gray. The 3D visualization on Figure B-53b is intended to show where the cross section is located within the model. As discussed in Section 2.5.9.2, of the four faults interpreted to be present within the AoR, none significantly impact the sealing capacity of the Anahuac Shale or UCCZ.

2.8.3 Net and Non-Net Model

In absence of any seismic attributes to guide the reservoir distribution in the model, available evaluations of the regional depositional environments were considered along with relevant well data to help provide an accurate and representative sand distribution for the geologic model. A two-step facies modeling approach was adopted to capture the heterogeneity of the injection intervals. The first step was net and non-net modeling that captured the distribution of the net and non-net components of the injection intervals laterally and vertically. The second step was modeling of different net facies (coarse sand, sand, and silty sand) within the net regions defined in step one.

Approximately 96 wells within the model boundary contained lithological logs (SP or gamma ray); locations are presented in Figure B-11b. Figures B-12 and B-13 present cross sections illustrating the lithological variation across the AoR. While the confining and injection zone formations are continuous across the AoR, internal variations within each of these zones (e.g., the changing bed thicknesses, intra-zonal shales, and lithological variations) were identified in the well logs. To estimate the volume of shale in each well, a shale baseline and a sand baseline were chosen according to the SP or gamma ray log character of each well. Using the baselines (100% sand and 100% shale values) of the individual SP or gamma ray log for each well, a volume of shale curve was calculated. Claimed as PBI [redacted]

The interpreted net and non-net logs were upscaled to model resolution and then distributed within the 3D model using a combination of object-based modeling and truncated gaussian simulation algorithms. This hybrid modeling approach was adopted to adequately capture the reservoir heterogeneity while preserving the concept of fluvial channels and deltaic lobes within the fluvio-deltaic environment of deposition.

The object-based modeling approach was determined to be a suitable approach to characterize the channelized architecture in the Fleming Sand 1 and 2 intervals. The channel remnants in these zones were populated using truncated gaussian simulation ensuring that the target sand proportions from the upscaled well logs were achieved.

The Fleming Sand 3 and Upper Frio injection intervals, representative of deltaic lobe environments, have been modeled using truncated gaussian simulation algorithm, maintaining the target sand proportions received from the upscaled well logs. The truncated gaussian simulation algorithm is known to be a suitable option for this purpose.

Geostatistical analysis was conducted for the net reservoirs in the Fleming and Upper Frio Formations to assign appropriate variogram ranges for the vertical axis, major axis, and minor axis. An example variogram plot and analysis is shown on Figure B-54. The variograms are used to define variability of the property between two upscaled cells in each direction.

Table 2-17 presents the variogram evaluations for the net facies within the Fleming and Upper Frio Formations. The variogram analysis identifies the degree of anisotropy in the net facies along major and minor directions. Figure B-54 displays a blue line, representing the modeled variogram, while the histograms indicate the frequency of semi-variances observed in each pair of data points at a given distance. The major, minor, or vertical ranges are defined by the

distance where the curve for semi-variance flattens, indicating no correlatability between a pair of data points beyond that distance. Figure B-54 is a visual representation of Table 2-17.

The proportion of the net reservoir to non-net reservoir (e.g., shale) for each of the intervals within the injection zone is presented in Table 2-18. Claimed as PBI [redacted]

The net and non-net property was used to create the net thickness maps for the injection intervals shown on Figures B-18, B-20, B-22, B-25, and B-27. Also, the net shale (non-net) thickness maps were created from this property to represent the net shale distribution of the UCCZ and the Anahuac Shale, shown on Figures B-31 and B-34, respectively.

2.8.4 Net Facies Model

The VShale log was based mostly on SP, which was the most common lithological log in the dataset. In some cases, only gamma ray without SP was available and was used for the volume of shale log determination. However, these cases made up less than 10% of the total cases modeled. To normalize SP values for upscaling lithologies, the SP log was drift corrected to force the shale baseline to zero millivolts (mv). In cases of the gamma ray log, the drift correction for the shale baseline (100% shale) was assigned as 150 API units. The volume of shale log was then used to determine flow units using a cutoff based on the lithology-porosity-permeability relationship discussed below.

Claimed as PBI [redacted]

The injection zone facies classification is shown on Figure B-55 where four facies were identified based on the volume of shale log. The cutoffs used to identify these facies are discretized zones in Figure B-55. The injection zone facies classifications for these four facies are described in Table 2-19. This table identifies the range of volume of shale calculation for each of the facies used in the geologic model. Claimed as PBI [redacted]

Claimed as PBI [redacted] A statistical overview of net and non-net rocks within these intervals is given on Figure B-56, demonstrating the high content of shale present.

The interpreted net facies logs were upscaled to model resolution with a bias to the net intervals using the same algorithm performed in Section 2.8.3 – Net and Non-Net Model, then distributed within the net regions in the 3D model using the truncated gaussian simulation algorithm. The statistical parameters and trend maps helped to distribute the best quality facies Claimed as PBI

Claimed as PBI along the core of the geobodies (e.g., channels, lobes) while sequentially deteriorating (coarser sand to sand to silty sand) toward the flank.

An example of the lithofacies model is presented on Figure B-57a and B-57b. Figure B-57a presents a cross section across the AoR through seven wells in the geologic model. The results show excellent correlation between modeled facies and log assignment. It also illustrates how the volume of shale log and subsequent facies classification were populated in the model. Figure B-57b presents the map-view of representative layers for the Fleming and Upper Frio injection intervals. The facies on Figure B-57b were mapped based on the interpreted depositional environment for the two injection intervals.

The net reservoir proportion calculated for each interval is summarized in Table 2-18 and a further breakdown of the reservoir facies within the net reservoir is summarized in Table 2-20.

Claimed as PBI

2.8.5 Net-to-Gross Model

The Net-to-Gross (NTG) model was used to address the upscaling effect from log scale to the 3D geologic model scale. While performing facies upscaling, the geologic model cell will assign the facies code that has highest fraction from the respective well log interval. Thus, for interbedded reservoirs, the model cells that are assigned to the net facies code represent a mixture of net/non-net.

The NTG property is introduced to compensate for this upscaling effect. To perform NTG property modeling, first the NTG log is created based on the facies code. For net facies, the NTG value equals 1, otherwise NTG equals 0. As a result, the proportion of net facies (i.e., coarser sand, sand, and silty sand) to non-net facies (shale) within a grid cell gets represented as NTG.

The second step upscales the NTG log into the geologic model which re-calculates the proportion of net within a grid cell as a fraction between 0 and 1.

The third step is to derive the NTG distribution per zone per facies. The statistical distribution (range) of NTG derived from the upscaled well logs for the net reservoirs of each injection interval in the Fleming and Upper Frio Formations are used as key model input parameters as shown on Figure B-58. The NTG model is built for each facies within the injection zone using a sequential gaussian simulation algorithm ensuring the NTG targets received from upscaled wells are being honored. An example cross section of the NTG model results is shown on Figure B-59, which identifies the variability of the net thickness between the wells and how the geologic model handled the upscaling. Hotter colors, such as red, identify zones with higher NTG values, while lower NTG values are cooler colors, such as blue. The thicker shale beds, such as the UCCZ and the Anahuac, are shown in blue.

2.8.6 Porosity Model

Porosity logs from 16 wells within the geologic model boundary were upscaled to model resolution. Compressional sonic data were the most common porosity data source, but some bulk density data also informed porosity estimation. VShale from SP, Total Porosity and Permeability were calculated at the stratigraphic well and Walter Co - 1 for various intervals including the UCCZ (Figures B-60a and B-60b), Fleming injection intervals (Figures B-61a and

B-61b), Anahuac Shale (Figures B-62a and B-62b), Upper Frio injection interval (Figures B-63a and B-63b), and LCZ (Figure B-64).

Claimed as PBI [redacted]

The porosity data were de-clustered to remove sampling bias within the data in 3D space. Distribution of the de-clustered data was then used to define the porosity histograms by facies. As part of the modeling process, total porosity logs were upscaled, with a bias to the modeled facies.

Porosity distribution within the injection zone intervals (Fleming Sands 1, 2, and 3; Upper Frio Sands 1 and 2) are shown on Figure B-65a. The porosity distribution was further characterized by facies within the Fleming and Upper Frio Formations, as shown on Figure B-65b. A review of the histograms indicated the de-clustered porosity distribution for the wells in the model area and the stratigraphic well. An example cross section of the total porosity model is shown on Figure B-66 using the process shown in Figures B-65a and Figure-65b.

2.8.7 Permeability Model

Permeability was modeled based on the results of the total porosity estimates. Separate porosity-permeability transforms were developed for the Fleming and Frio. The NMR log was calibrated against core and used to define porosity-permeability relationships across the range of net reservoir facies to address limitations in the core analyses. This relationship was then upscaled using Swanson's mean to account for differences between core, log, and model scales (Delfiner, 2007). An example of the implemented porosity-permeability relationship is shown in Figure B-67.

2.8.8 Injection Zone Permeability Test Results

Separate pressure fall-off tests were performed on the Fleming Sand 2, Fleming Sand 3, and the Upper Frio Sand 1. Claimed as PBI [redacted]

Standard log-log and semi-log analyses methods were used in the Saphir well test simulator to analyze the long term (hours) injection fall-off tests that are summarized above, which were conducted individually in the Upper Frio and the combined Fleming Sands. Additional information, including data and discussion of the analyses that include the effects of wellbore storage and skin factors are described in Appendix B.3.

The fracture gradients obtained from the SRTs are discussed in Section 2.6.2 – Elastic Moduli, Strength, and Ducility.

2.8.9 Injection Zone Storage Potential

The 3D geologic model built for the site integrated data from the stratigraphic well, available seismic and well data, geologic concepts, and local rock properties. The geological model was used to estimate the storage potential for the developable area around the proposed injection well locations is 53 million metric tonnes (MMt). A standard volumetric assessment workflow has been used to calculate the storage potential, represented by Equation 7.

$$CO_2\ Storage\ Potential = V_B * NTG * \phi_t * \rho * S.E. \qquad Equation\ 7$$

Where:

V_B = Bulk Rock Volume

ϕ_t = Net Porosity

ρ = CO2 Density

S.E. = Storage Efficiency

Claimed as PBI [redacted]

A review of the simulation results indicated the CO2 injection potential to be a maximum of 5 MMta for three injection wells over an injection period of 13 years within an AoR of approximately 4,500 acres, validating the estimated storage potential.

2.8.10 Model Uncertainties

Below is a list of uncertainties inherent to the analysis presented regarding the generation of the geologic model:

- Storage potential and efficiency such as the net thickness of the injection zone between wells, including variations in the continuity of the net facies;
- Model upscaling representing the depositional environments;
- Vertical versus horizonal permeability relationships based on the log data; and
- Intra-zonal flow barriers, baffles, and pinch-outs.

Based on the available data used in the geologic model, these uncertainties are not expected to have a significant impact on the model results and delineation of the AoR. The geologic model will continue to be updated and refined in the pre-operational and operational phases of the Project so that the key geologic features of the Project area continue to be represented in the CO2 plume and brine pressure front model.

2.9 Assessment of Injection Interval and Confining Zone Geochemical Reactions

The evaluation of the injection zone fluid geochemistry and minerology includes an assessment of the compatibility of the CO2 stream with subsurface conditions. The objective of this assessment was to predict how storage and injectivity may be impacted by potential geochemical reactions. The following discussion describes the potential for mineral dissolution and precipitation chemical reactions to occur in the presence of a CO2-saturated brine.

2.9.1 Summary of Available Geochemical Data

The geochemical data for fluids in the injection intervals were obtained from the stratigraphic well and compared with the USGS National Produced Waters Geochemical Database (Blondes et al., 2018), as shown in Figure B-68(a). This database contains information on the likely range of geochemical parameters and the nature of connate formation brines present in the proposed injection intervals. The major cation and anion composition of water samples from the stratigraphic well are provided in Appendix B.4, along with produced water chemistry from Jefferson County, Texas (Blondes et al., 2018).

Cross plots of Cl- versus pH, Br-, Na+, Mg2+, Ca2+, HCO3-, K+, Si4+, and total dissolved Fe are provided in Figure B-68(a). Note that limited number of apparent anomalous produced water sample results were not plotted on this figure to facilitate analysis. In general, the major cations and anions of the water samples from the stratigraphic well are consistent with regional trends, with the exception of Ca2+, which tends to be higher in concentration relative to the regional trend at similar Cl^- content, but still within regional trends. The fluids obtained from the stratigraphic well are moderately high salinity, predominantly sodium chloride brines, with reported total dissolved solid (TDS) Claimed as PBI

Elemental analysis of formation solids in the UCCZ and Anahuac Shale confining zones and Fleming 1, Fleming 2, Fleming 3, and Upper Frio injection zones was performed using x-ray fluorescence (XRF, Table 2-23a). Many trace elements, including lead and uranium are below detection limits (BDL). Arsenic was found to be BDL (<20 parts per million [ppm]) in most samples from the injection intervals and only slightly above detection limits in the confining zones. Note that cuttings samples were used for XRF and, as such, the barium concentration is likely contaminated by barite drilling additives. Also, ruthenium concentrations are influenced by bleed from the rhodium tube used.

2.9.2 Modeling Approach for Potential Geochemical Reactions

The potential for brine-mineral-CO2 interactions were modeled to assess the potential alteration of both the reservoir and sealing lithologies during and following CO2 injection. The injection of CO2 will result in a decrease in pH as the CO2 dissolves into the brine phase, forming carbonic acid which dissociates rapidly to form bicarbonate and hydrogen ions. This decrease in pH puts the brine-mineral-CO2 system in disequilibrium and subsequent mineral phase dissolution and anticipated precipitation reactions occur to buffer the pH and restore equilibrium with the altered brine chemistry. The anticipated fluid-mineral reactions include dissolution of feldspars to precipitate kaolinite and dawsonite and the dissolution/precipitation of carbonates such as calcite (Gaus, 2010; Shiraki and Dunn, 2000; Tang et al., 2021).

Trace metal mobilization was assessed using reaction-path geochemical models tracing the sorption of Zn2+, Co2+, and Ni2+ from the surface of iron oxide minerals during CO2 injection.

These elements were chosen based on the water analyses collected over various depths from Bead Farm Co. #1, Bead Farm Co. #2, Bead Farm #3, and Labelle Properties Ltd. #1. Figure B-68(b-d) shows changes in trace metal composition in the brine due to sorption versus CO2 fugacity from Bead Farm #3 (Claimed as PBI). The modeled trends shown in Figure B-68(b-d) were directionally similar in all water samples modeled, with differences in the magnitude of change resulting from different starting compositions, temperatures, and pH. The concentrations of Zn2+, Co2+, and Ni2+ increase following CO2 injection due to desorption form iron oxide surfaces accompanying the rapid drop in pH, followed by a slight decrease in concentration of each element. Ni2+ shows the largest increase in concentration associated with desorption, in some cases doubling the Ni2+ concentration of the brine. There is no significant difference between the pre injection and modeled final concentration of Zn2+ and Co2+. Table 2-23b shows the measured initial and modeled final concentrations of Zn2+, Co2+, and Ni2 for water samples.

2.9.4 Site-Specific Geochemical Model Methodology

2.9.4.1 Reaction-Path Models

Simple reaction-path models were developed using The Geochemist's Workbench (GWB; Bethke and Yeakel, 2022) to trace mineral stability boundaries as chemical reactions progress and provide information on fluid evolution and mineral precipitation and dissolution. The models utilized here use a rate law expression and pH dependent rate constants described in detail in Palandri and Kharaka, 2004. Activation energies and neutral, acid, and base mechanism rate constants used in the models are provided in Table 2-22. The two major inputs for these models are the brine chemistry and the formation mineralogy.

2.9.4.2 Model Input of Brine Chemistry Data

The brine chemistry from the stratigraphic well provided in Table 2-23c and Appendix B.4 was used as a starting point for the reaction-path models for each of the modeled formations. The brine chemistry was found to be somewhat incomplete relative to the site-specific mineralogical data. The fluid is in equilibrium with quartz and feldspars; however, the analysis of the brine did not provide the concentrations of Al3+ or SiO2(aq). To estimate these components, the SpecE8 module from GWB was used, setting SiO2(aq) and Al3+ concentrations to be controlled by equilibrium with quartz and k-feldspar, respectively. Brine chemistry specific to the Anahuac Shale was not analyzed and, as such, was estimated by averaging the brine chemistry of the two bounding layers, the Fleming Sand 3 and the Upper Frio Sand. The equilibrated fluid compositions from SpecE8 used in the reaction-path models presented are in provided in Table 2-23c along with TDS, formation temperature, and pH.

2.9.4.3 Model Input: Formation Mineralogy

The representative mineralogy for each formation used in the reaction-path models is provided in Table 2-24. Note that these mineralogies represent greater than 96% of the XRD mineralogy results and represent the major minerals that are likely to participate in chemical reactions in the subsurface at the injection site. Representative mineralogies for each of the UCCZ, Fleming Sand 1, Fleming Sand 2, Fleming Sand 3, Anahuac Shale, and Upper Frio formations were obtained by averaging the site-specific XRD data within a given formation provided in Appendix B.4.

The process of selecting minerals to represent the formation mineralogy in the geochemical models was developed through a step-by-step rationalization process, consistent with a typical geochemical modeling approach. Minerals that were not consistent throughout the formation or minerals not expected to significantly impact the modeling results (such as anatase) were not included in the models. For the UCCZ and Anahuac Shale, pyrite and marcasite were combined. Albite was substituted for "plagioclase." The mixed interlayered Illite/smectite was subdivided into Illite and smectite portions using the smectite abundance provided in the XRD results. Smectite type or composition was not distinguished in the XRD results. As such, the method used by Xu et al., (2006) to estimate Na- and Ca-Smectite using the wt% ratio of Na and Ca in the formation fluid was used.

2.9.5 Simulating Initial Brine-Mineral Equilibration and CO2 Reactions

Before adding CO2 to the brine-mineral system, the brine chemistry provided in Table 2-23c was equilibrated with the formation mineralogy (Table 2-24) over a 5,000-year model simulation period in the React module of the GWB. During this equilibration step, the minor amount of calcite present in the Upper Frio Sand and Fleming Sand 2 mineralogies (<1 Wt.%) was found to completely dissolved in favor of dolomite precipitation. As such, calcite was removed from the primary mineralogy for the Upper Frio Sand and Fleming Sand 2.

The React module of GWB was used to simulate CO2 injection into the initial brine-mineral equilibrated solution. The amount of CO2 gas dissolved into the brine solution was limited to its solubility at subsurface conditions for each modeled interval. CO2 solubility was calculated using Duan and Sun (2003) CO2 was added to the model until the solubility limit was reached, at which point the CO2 gas fugacity was fixed to simulate a system of a CO2-saturated brine that is in equilibrium with a separate CO2 fluid phase. This is expected to occur quickly and, as such, this variable CO2 gas fugacity step was modeled to occur within 0.05 year into injection.

The chemical reactions that occur during the fixed CO2 gas fugacity model step were simulated for a 100-year period. During this time, secondary minerals may become saturated in the brine phase and precipitate. The secondary minerals used in the models were chosen based on the saturation index of various minerals at the end of a preliminary fixed fugacity model for each formation. The secondary minerals with a saturation index of greater than unity were given proper kinetics and the fixed fugacity model was re-run, allowing these phases to precipitate. Table 2-25 lists the observed secondary minerals for each of the five models, including ankerite and dawsonite, which are carbonate minerals and store some CO2 in their chemical structure. The thermo.com.V8.R6+.tdat database (Wolery, 1992), modified to include thermodynamic data on ankerite, was used in all models. Table 2-26 lists the relevant chemical formulae of the modeled minerals.

2.9.6 Summary of Site-Specific Geochemical Model Results

The geochemical models were used to simulate the potential for significant mineral precipitation and dissolution to occur in the injection and confining intervals. Figures B-69 (a, b, and c), B-70, B-71, and B-72 present the geochemical modeling results for the Fleming injection intervals, Upper Frio injection interval, and UCCZ, and Anahuac Shale, respectively. The results are plotted as change versus time for these relationships:

- mineral wt.% versus elapsed time during the fixed CO2 gas fugacity portion of the model (time interval of 0.05 - 100 years);
- pH versus time over both the variable and fixed fugacity portions of the model (time interval of 0 -100 years); and
- total mineral volume change versus time during the fixed fugacity portion of the model.

The following discussion presents the model results for each interval.

2.9.6.1 Geochemical Model Results for UCCZ

After 100 years of model simulation, the total mineral volume of the UCCZ was predicted to decrease by approximately Claimed as PBI relative to the initial volume.

Initially, dissolution dominated the first 25 years reaching a minimum mineral volume of [redacted] less than the starting volume. The steep portion of this dissolution (first 15 years of reaction) corresponds with calcite dissolution. After 15 years, the rate of mineral volume decrease slows until precipitation of secondary minerals and clays results in a net positive mineral volume increase from approximately 25 years until the end of the model simulation.

As illustrated on Figure B-71, the modeled formation mineralogy for the UCCZ is predominantly composed of clays at Claimed as PBI Of the primary mineralogy, Ca- and Na-smectite, kaolinite, and quartz were predicted to precipitate and albite, illite, and siderite were predicted to dissolve. No change in the amount of pyrite was predicted by the model. K-feldspar and dolomite initially dissolve until nine years when both begin to precipitate. Calcite initially dissolves, buffering the pH of the system until the pH reaches approximately [redacted] after 15 years. The dissolution of calcite and siderite resulted in the formation of secondary ankerite until the siderite in the system was completely consumed by the reaction after approximately 26 years. Other secondary minerals including pyrophyllite, Mg- and K-smectite, and dawsonite were predicted to precipitate due to dissolution of silicate minerals.

2.9.6.2 Geochemical Model Results for Fleming Sand 1

After 100 years, the total mineral volume decreased by Claimed as PBI relative to the initial mineral volume. Dissolution reactions initially dominates during the first five years, resulting in a reduction of Claimed as PBI relative to the initial volume. This decrease in volume can largely be attributed to the dissolution of calcite. Once calcite dissolution slowed, the precipitation of silicates, such as the smectites and kaolinite, and secondary dawsonite had a greater effect on the total mineral volume compared to the dissolution of silicates such as Illite and albite, resulting in a very slight net increase in mineral volume over the remaining Claimed as PBI less than the initial volume.

The geochemical model results for the Fleming Sand 1 are provided in Figure B-69a. The modeled formation mineralogy is predominantly composed of quartz and feldspars at [redacted] Of the primary mineralogy, Ca- and Na-smectite, kaolinite, K-feldspar, dolomite, and quartz precipitated and albite, and Illite dissolved. Calcite initially dissolves, buffering the pH of the system until the Claimed as PBI after five years and remains relatively constant for the remainder of the simulation. The secondary minerals predicted to precipitate are pyrophyllite and dawsonite.

2.9.6.3 Geochemical Model Results for Fleming Sand 2

Dissolution dominates during the entire modeled period, and at the end of the 100-year simulation period, the total mineral volume of the Fleming Sand 2 was predicted to decrease by Claimed as PBI relative to the starting volume. The initial mineralogy contains no calcite, and, as such, pH buffering is controlled mainly by silicate mineral dissolution, which is slower. This magnitude of dissolution within an injection interval was not deemed to have a significant consequence on the planned injection rates, volumes of CO2 sequestered, or the containment properties of the UCCZ.

The geochemical model results for the Fleming Sand 2 are provided in Figure B-69b. The modeled formation mineralogy is predominantly composed of quartz and feldspars at Claimed as PBI Secondary minerals dawsonite, pyrophyllite, Mg-smectite, and muscovite formed from the dissolution of silicate minerals.

2.9.6.4 Geochemical Model Results for Fleming Sand 3

After the model simulation period of 100 years, the total mineral volume was predicted to decrease by Claimed as PBI relative to the initial mineral volume. Dissolution of calcite was predicted to dominate initially during the first seven years. Once calcite dissolution slowed, the precipitation of silicates, such as the smectites and kaolinite, and secondary dawsonite had a greater effect on the total mineral volume compared with the dissolution of silicates such as Illite and albite.

The geochemical model results for the Fleming Sand 3 provided in Figure B-69c were based on a formation mineralogy, which was found to be predominantly composed of quartz and feldspars at Claimed as PBI The Fleming Sand 3 behaves similarly to the Fleming Sand 1, both containing a sufficient wt.% of calcite that dissolves to buffer the pH. Of the primary mineralogy, Ca- and Na-smectite, kaolinite, K-feldspar, dolomite, and quartz precipitated and albite, siderite, and Illite dissolved. Calcite initially dissolves, buffering the pH of the system until the pH reaches Claimed as P after seven years and remains relatively constant for the remainder of the simulation.

Due to the presence of siderite and the higher Fe content of the brine compared with the other Fleming sand formations, secondary ankerite precipitates until the siderite in the system was completely consumed by the reaction. Other secondary minerals pyrophyllite and dawsonite precipitated from the dissolution of silicate minerals.

2.9.6.5 Geochemical Model Results for Anahuac Shale

After 100 years, the model predicted a Claimed as PBI decrease in the total mineral volume relative to the initial volume. Dissolution of calcite initially dominates the total volume change for the first four years. Once calcite dissolution slowed, the precipitation of silicates, such as the smectites and kaolinite, and secondary dawsonite had a greater effect on the total mineral volume compared with the dissolution of silicates such as Illite and albite, and the total mineral volume increased from a minimum of Claimed as PBI less than the initial volume to Claimed as PBI less than the initial volume.

The geochemical model results for the Anahuac Shale are given in Figure B-72. The modeled formation mineralogy is predominantly composed of clays at Claimed as PBI Of the primary mineralogy, Ca- and Na-smectite, kaolinite, K-feldspar, dolomite, and quartz precipitated and albite, and illite dissolved. No change in the amount of pyrite was predicted by the model. Calcite initially

dissolved, buffering the pH of the system until the pH reaches [redacted] after four years. From that point, the pH remained relatively constant and some calcite began to precipitate. Secondary minerals pyrophyllite, Mg-smectite, muscovite, and dawsonite also precipitated, likely from the dissolution of silicate minerals.

2.9.6.6 Geochemical Model Results for Upper Frio

After 100 years, the model estimated a decrease in the total mineral volume of [redacted] relative to the initial mineral volume.

The geochemical model results for the Upper Frio are given in Figure B-70. The modeled formation mineralogy is predominantly composed of quartz and feldspars at approximately [redacted] Similar to the Fleming Sand 2, the Upper Frio Sand was modeled to contain very little carbonate in the starting mineralogy. The pH was buffered by silicate mineral dissolution, which results in a longer amount of time required to reach a stable pH relative to the more formations with a larger weight percentage of carbonate in the initial mineralogy. Secondary minerals dawsonite, pyrophyllite, Mg-smectite, and muscovite formed from the dissolution of silicate minerals.

2.9.7 Summary of Mass Transfer Potential Resulting from CO2 Injection

The following findings were apparent from the review of the six formation-specific geochemical models and the trends in mineral phase dissolution and precipitation. None of the trends were found to have a material impact on the potential storage characteristics of the Project site:

- Precipitation and dissolution of minerals was predicted to occur at an insignificant magnitude that does not alter the volume of the minerals in the injection or confining intervals significantly;
- For the intervals with calcite (UCCZ, Fleming Sand 1, Fleming Sand 3, and the Anahuac Shale), Fleming Sand 1 was predicted to have the largest decrease in total mineral volume [redacted] with no significant impact on porosity [redacted]
- For the intervals without primary calcite (Fleming Sand 2 and the Upper Frio), slow pH buffering resulted in longer periods of dissolution-dominated decreases in the total mineral volume of the system, however, largest decrease in mineral volume percent [redacted] is smaller than the largest total volume decrease predicted in the systems with faster pH buffering; and
- When the models predicted that the net result of precipitation on the total mineral volume was larger than the net result of dissolution on the total mineral volume, the volume of mineralization was less than the preceding dissolution volume. The largest increase in total mineral volume during this period in a given model was predicted for the Fleming Sand 3 showing a [redacted] increase in the total mineral volume relative to the minimum volume. This increase in precipitation corresponds to an increase in porosity of [redacted] —an insignificant increase.

2.9.8 Potential Uncertainty in Geochemical Reaction Path Model

A review of the input data, site characterization data, geochemical model performance identified the potential for uncertainty to influence the model results. As outlined below, steps were taken

to reduce the potential for the uncertainty in site characterization and modeling approach to impact the overall findings of the geochemical model.

There is uncertainty involved in using laboratory derived kinetics to model natural systems. Laboratory results tend to be several orders of magnitude faster than what is observed in nature (Brantley, 1992). This is due to several factors, such as limited contact of fluid with minerals and surface area impacted by natural processes. Other potential sources of uncertainty introduced using kinetics include reactions occurring at laboratory conditions that are not predominate in nature and the impact of bacteria on reaction rates (Bethke, 2022)

The initial brine-mineral equilibration step resulted in pH values that ranged from Claimed as PBI for the six models, which is lower than the Claimed as PBI values reported on Table 2-23c. As a result, the model results may reflect a slightly more acidic condition than what exists, trending toward more dissolution and porosity. Under the modeled pH conditions, no significant impacts on the modeled interval porosity were noted.

The analytical results for brine samples did not include dissolved SiO2 and Al3+ typically derived from dissolution of quartz and feldspars. Estimated equilibrium concentrations were derived using the SpecE8 module from GWB. This approach has been shown to provide reasonable initial concentrations for reaction-path modeling. The resulting precipitation and dissolution of mineral phases were reviewed to reduce the potential for unrealistic precipitation simulated by the model. None was found.

Brine chemistry specific to the Anahuac Shale was estimated by averaging the brine chemistry of the two bounding layers, the Fleming Sand 3 and the Upper Frio Sand. It is expected that the brine geochemistry for the overlaying and underlying formations are a reasonable basis for the Anahuac Shale, especially considering that cross flow through the Anahuac Shale is not likely to be a factor based on its sealing properties.

The potential for slight uncertainty in TDS or temperature of the confining and injection intervals to impact model results was deemed to be insignificant. Temperature will impact the rate of chemical reactions and the TDS will impact mineral precipitation and dissolution, Temperature and TDS also control the solubility of CO2 in the brine phase. However, it was observed that the reaction-path models were most sensitive to changes in the primary mineralogy (e.g., presence of significant wt% calcite in the primary mineralogy).

2.9.9 Summary of Predicted Geochemical Reactions and Potential for USDW Endangerment

A series of geochemical scenarios were modeled to provide predictions on the compatibility of the injection and sealing intervals of the AoR with the injection of CO2 and the subsequent CO2-saturated brine. These site-specific models used fluid chemistry from the stratigraphic well that is consistent with produced water chemistries in the region and XRD mineralogical data representative of the formations of interest. All six formation models demonstrated that during the interaction of the CO2-saturated brine and the formations of interest, both precipitation and dissolution of minerals is predicted to occur at a magnitude that does not significantly alter the total mineral volume of the system. As such, no significant change in mineral or pore-space volume in the formations was predicted by the models.

2.10 Hydrogeology

The Project site is in northwestern Jefferson County, overlying the Gulf Coast Aquifer. The Gulf Coast Aquifer is a major aquifer designated by the Texas Water Development Board (TWDB) extending from the eastern border with Louisiana to the United States border with Mexico. The maximum total sand thickness of the Gulf Coast Aquifer ranges from approximately 700 ft in the south to approximately 1,300 ft in the north. According to George et al. (2011), freshwater saturated thicknesses average approximately 1,000 ft. The Gulf Coast Aquifer is used for municipal, industrial, and irrigation purposes.

2.10.1 Identification of USDW

The hydrogeologic column, shown in Figure B-73, identifies aquifers and confining intervals within the larger Gulf Coast Aquifer system and identifies several hydrogeologic units of interest for the identification and protection of USDWs within the AoR: primarily the Chicot, Evangeline, and Jasper Aquifers. These aquifers are comprised of discontinuous sands, silt, clay, and gravel beds (George et al., 2011). The Burkeville confining unit (best represented by the Middle Lagarto Formation) and the Catahoula Formation are considered regional confining units (Young et al., 2016).

The Chicot Aquifer is the most prolific USDW aquifer within the AoR, and its shallow water-bearing zones are a target for completion of water wells, typically at depths ranging from approximately 150 to 400 ft below ground level (BGL) in the AoR. The Chicot Aquifer includes the Pleistocene-age Lissie and Beaumont Formations and the upper Pliocene Willis Formation.

The Evangeline Aquifer includes the Middle and Late Miocene-age Upper Lagarto Formation, and the Upper and Lower Goliad intervals. The regionally extensive Burkeville confining unit is identified by Young et al. (2016) as generally comprised of the Middle Lagarto Formation. The Jasper Aquifer is considered to include the Lower Lagarto and Oakville Formations of the Early and Middle Miocene.

A review of the data from the TWDB indicated that the Chicot Aquifer is the primary source of potable and non-potable water within the AoR. Very few wells were identified that extend below the Chicot Aquifer and into the upper portion of the Evangeline Aquifer. No water wells were identified within or near the AoR that extend to the Jasper Aquifer. Claimed as PBI [redacted] This depth corresponds with the upper portion of the Evangeline Aquifer, which extends to the UCCZ.

The bottom of the lowermost USDW was confirmed by both literature review and through the collection of open hole wireline-resistivity logs at stratigraphic well in October 2023.

2.10.2 Total Dissolved Solids and Groundwater Flow Direction

Multiple studies of the Gulf Coast Aquifer hydrogeology have been performed and a considerable number of studies have been conducted regarding the formation brine salinity trends (i.e., TDS) with depth. Baker (1978) published multiple cross sections characterizing groundwater salinity with depth in the Gulf Coast Aquifer and identified an estimated depth of the occurrence of groundwater with TDS concentrations below 3,000 mg/L. Young et al. (2016)

has produced an extensive evaluation of water quality in the Gulf Coast Aquifer and mapped groundwater quality with depth for several TDS intervals. These include what the authors describe as “fresh,” “slightly saline,” “moderately saline,” “very saline,” and “brine,” at upper TDS values of 1,000, 3,000, 10,000, 35,000 mg/L, and above, respectively.

Figure B-74 presents a general hydrogeologic cross section in the northern portion of the Gulf Coast Aquifer, which represents the configuration of these units near the Project area. Figure B-74 also presents the maximum depth of freshwater (defined as less than 1,000 mg/L TDS) based on groundwater sampling in five-by-five mile grid blocks by Young et al. (2016). Near the Project area, this depth to freshwater is estimated to range from less than 250 ft (Figure B-74) to approximately 300 ft based on potable water supply wells completed in the area reported by the TWDB (Well #6161602). Below this depth, a review of TWDB potable water quality data indicates that the TDS levels increase above 1,000 mg/L TDS with little increase in depth.

Figure B-75 presents the estimated depths to the base of fresh water (less than 1,000 mg/L TDS) and estimated depths to the base of 3,000 mg/L TDS groundwater in the Gulf Coast Aquifer. These data are based on water quality calculations by Young et al. (2016). Near the site, these depths range between 250 to 500 ft (fresh water) and 1,000 to 1,500 ft (less than 3,000 mg/L TDS; Figure B-75). The Railroad Commission of Texas estimated that the depth to 3,000 mg/L TDS water was approximately 650 ft BGL as reported in the W-2 Form for the stratigraphic well, which is in the AoR near the injection wells. Figure B-76 presents estimated depths to the base of groundwater with TDS concentrations less than 10,000 mg/L (or base of the lowermost USDW defined by 40 CFR 146.3) and for brines that contain less than 35,000 mg/L TDS, based on water quality calculations by Young et al. (2016).

The groundwater flow directions in the Chicot and Evangeline Aquifers are toward the Gulf (Ryder, 1988). Localized groundwater flow directions for the Chicot and Evangeline Aquifers can be influenced by groundwater withdrawals. Groundwater moves within aquifers from areas of higher hydraulic head to areas of lower hydraulic head, and the flow direction is generally perpendicular to potentiometric surface contours. A potentiometric surface map of the Chicot aquifer published by the TWDB is provided in Figure B-77a for reference. The map suggests that groundwater should flow south-southeast near the Rose Project, as indicated by the bold blue arrows.

2.10.3 Evaluation of the Lowermost USDW

This section presents a site-specific evaluation of water quality with depth, the identification of the lowermost USDW, and distance from the lowermost USDW to the top of the injection zone within the AoR. Three lines of evidence were used to assess water quality with depth in the vicinity of the site. Each line of evidence is presented below. [redacted] The other two lines of evidence corroborate this value and increase the confidence that this depth is protective within the AoR.

2.10.3.1 Literature Review

Figure B-76 presents estimated depths to the base of groundwater with TDS concentrations less than 10,000 mg/L (or base of the lowermost USDW defined by 40 CFR 146.3) and for brines that contain less than 35,000 mg/L TDS, based on water quality calculations by Young et

al. (2016). Near the AoR, these depths are reported to be approximately 1,000 to 1,500 ft and 2,000 to 2,500 ft, respectively (Figure B-76). At depths that exhibit TDS concentrations greater than 35,000 mg/L TDS, salinity levels were observed to continue to rise or remain steady with depth, and do not exhibit salinity levels less than 35,000 to 50,000 mg/L (Young et al., 2016).

Figure B-77b presents a regional hydrogeologic cross section (estimated water quality and regional aquifers), modified from Young et al. (2016). This cross section is located approximately 10 miles east of the Project area. Approximately 10 miles east of the Project area, an oil and gas well along this cross section (API 4224532572) shows an estimated depth to the base of the lowermost USDW (i.e., 10,000 ppm TDS) at approximately 1,000 ft. Up dip of the Project area and along the cross section to the north, API 4236100004 is projected depth to the lowermost USDW exceeds 2,000 ft (Figure B-77b). The lowermost USDW is located in the Chicot Aquifer near the Project area, though to the north of the AoR (up dip), the lowermost USDW is projected to extend into the Evangeline Aquifer (Figure B-77b) as all formations become shallower in elevation with distance to the north.

2.10.3.2 Water Quality Calculations

Water quality calculations were conducted to characterize water quality at depth in the Gulf Coast Aquifer and delineate USDW depths near the AoR. The data were sourced from published literature and studies of the Gulf Coast Aquifer and imaged well logs from the Railroad Commission of Texas, as well as the TWDB Brackish Resources Aquifer Characterization System. Water quality calculations presented in this section are based on available geophysical data (i.e., wireline log data) from oil and gas wells near the AoR. Figure B-78 shows the locations of seven oil and gas wells included in this analysis that contain sufficient wireline log data to assess depths to the lowermost USDW in the area. Log data utilized in these calculations include wireline-resistivity data to estimate formation brine resistivity (Rw) and gamma ray and/or SP data for lithologic determination. Information regarding these seven wells is provided in Table 2-27.

Water quality calculations are based on Archie's (1942) equation (assuming a 100% water saturated formation brine), whereby the formation brine resistivity (Rw) is calculated. The equation and usage for the Rw calculation is described below. Note that the porosity term (ϕ^m) is commonly referred to as the formation factor or formation resistivity factor (F).

$$Sw^n = Rw / (\phi^m * Rt) \qquad \textit{Equation 8}$$

Where:

Sw = water saturation of the uninvaded zone (100%)

n = saturation exponent

Rw = formation water resistivity at formation temperature (ohm*m)

ϕ = porosity (decimal)

m = cementation exponent

Rt = true formation resistivity (ohm*m)

In a fully water saturated formation (Sw = 1), the following equation is derived to calculate the resistivity of the formation brine (Rw). A reasonable value of Rt is obtained utilizing wireline-resistivity data, specifically deep resistivity data.

$$Rw = \phi^{m} * Rt \qquad \text{Equation 9}$$

Estepp (2010) estimated a range of cementation exponent (m) values between 1.3 and 1.4 for fine to medium-grained loose sands of the Gulf Coast Aquifer, and a range of 1.4 to 1.5 for more slightly cemented sands. Due to the degree of unconsolidation in these formations, Young et al. (2016) determined that a value of 1.3 for the cementation exponent (m) was appropriate for the Gulf Coast Aquifer, which is used for the water quality calculations.

In the absence of shallow porosity data, a correlation was used to estimate a value based on Young et al. (2016) and a relationship between depth and porosity (which decreases with depth) for the Gulf Coast Aquifer:

$$\phi = 36.64 - 0.001 * depth \text{ (Young et al., Equation 13-16)} \qquad \text{Equation 10}$$

Sand intervals (identified by SP and gamma ray logging data) within the estimated range of the USDW/non-USDW depths were evaluated from the seven offset wells to calculate water quality. Due to the potential impacts of thin bed effects on formation resistivity, a minimum sand bed thickness of 10 ft was implemented for water quality calculations. Water quality calculations are most representative from intervals in which the formation water resistivity remains relatively constant, or showing gradual change (Schlumberger, 2009).

Young et al. (2016) developed a TDS equation using an equivalent Archie's Rw method to estimate TDS for sands in the range of 10,000 mg/L TDS. Based on a correlation between resistivity and specific conductance (SC; a measure of how water conducts current), Young et al. (2016; Equation 13-15), provided the following equation to estimate water quality:

$$TDS = SCw77 * Ct \qquad \text{Equation 11}$$

Where:

SCw77 = specific conductance of formation brine (micromhos per centimeter [µmhos/cm] @ 77 °F)

Ct = specific conductance/TDS conversion factor

SC of the formation interval fluid was estimated as an equivalent-temperature value of Rw (Rw77). The SC (in units of µmhos/cm) is the reciprocal of resistivity (ohm*m), and calculated as follows:

$$SCw77 = 10{,}000/Rw77 \qquad \text{Equation 12}$$

Using deep resistivity log data (i.e., deep induction wireline curve) and a formation factor ($F = \phi^{m}$; m = 1.3) as previously discussed, Rw at estimated formation temperature is calculated (F * Rt), and converted to an equivalent value at 77 °F according to the following equation:

$$Rw77 = Rw * (T\,[°F] + 6.77) / (77\,°F + 6.77) \qquad \text{Equation 13}$$

To ascertain the SC/TDS conversion factor (Ct), Schlumberger (2009) determined the Ct value for a solution fully dominated by sodium chloride equals 0.56. Based on the work of Young et al. (2016), the authors observed Ct values between 0.57 and 0.59 in the Gulf Coast Aquifer, and a value of 0.58 was utilized in their regional evaluations for saline sand intervals in the Gulf Coast Aquifer. The same value was used for site-specific sand water quality calculations subsequently presented in this section. A summary of input parameters and calculations according to the calculation method of Young et al. (2016), for the evaluated sand intervals in each well is provided in Tables 2-28a through 2-28g. Due to the precision of the data utilized in these evaluations, estimated TDS is only reported to the hundreds significant digit.

Formation temperature of the sandstone intervals was determined based on regional data presented in Young et al. (2016). Near the Project site, mean annual surface temperature is approximately 20 °C (68 °F) and the temperature at 3,500 m (11,483 ft) was estimated at 114 °C (237 °F). Based on these temperatures, a linear relationship for temperature with depth (T) was applied to estimate formation temperature at depth. The assumed temperature gradient, in °F per 1,000 ft, is calculated below:

(237 °F–68 °F) / (3,500 m * 3.28084 ft/m * 1/1,000 ft) = 14.7 °F / 1,000 ft *Equation 14*

Table 2-29 provides a summary of the lowermost USDW for each well in log depth and ft above mean sea level (AMSL). A review of the results indicated that the calculated depth of the lowermost USDW ranges from approximately 1,100 to 1,750 ft BGL. A contour map showing the depth to the base of the lowermost USDW is provided on Figure B-78 based on the result from these wells in Table 2-29. In addition, a north to south cross section across the AoR (location of the cross section shown on Figure B-78) is shown on Figure B-79.

2.10.3.3 Base of Lowermost USDW at the Stratigraphic Well

Claimed as PBI [redacted]

The same methodology described in the previous section was used for the analysis summarized on Figures B-80 and B-81. Figure B-80 demonstrates the sensitivity to each parameter for estimating salinity based on resistivity logs using Archie's equation. Conservative values for porosity (35%), cementation factor, 'm' (1.6), and the best estimate of the temperature gradient at the stratigraphic well (gradient calculated from formation fluid samples collected at various depths within the Fleming and Upper Frio) at each depth of interest were selected to find the corresponding resistivity which equates to approximately 10,000 mg/L TDS. Sands with resistivity lower than 2.5 ohm*meters will have a corresponding salinity above the USDW limit of 10,000 mg/L TDS. Further decreases in porosity and resistivity or an increase of the cementation factor would result in even higher salinity values, proving that the lowermost USDW depth is estimated using the most conservative parameters.

To confirm the USDW interpretation from resistivity logs, the SP log was also analyzed to estimate the formation brine salinity. The SP log method is based on the magnitude of the SP deflection from the shale baseline, where the magnitude is directly proportional to the contrast in salinity between the formation brine and drilling mud filtrate across clean, thick (greater than 10

to 15 ft) sands. Details on the exact equations for estimating formation brine resistivity from SP logs are presented below and can be found in Bateman and Konen (1977). Because the surface hole section of the stratigraphic well was drilled with potassium chloride brine for swelling clay inhibition, a correction for non-NaCl drilling fluids was also investigated based on Cox and Raymer (1976). These corrections showed significantly higher salinities than those obtained under the assumption of an NaCl drilling fluid. The more conservative NaCl calculations were used.

The results presented on Figure B-81 show alignment between SP and resistivity log results. This alignment increases the confidence in identifying the depth of USDW by indirect log-based methods within the AoR. For the five sand zones analyzed (Figure B-81), the uppermost Zones 1, 2 and 3 were interpreted to have salinities of less than 10,000 ppm TDS, whereas Zones 4 and 5 were interpreted to have salinities greater than 10,000 ppm TDS.

The following procedure based on Bateman and Konen (1977) was used for estimating salinity from SP logs:

1. Calculate the mud filtrate resistivity, Rmf @ 75 °F using measured mud filtrate sample resistivity, Rmfs (collected during wireline logging activities), and mud filtrate sample temperature, MFST:

Rmf75 = Rmfs * (MFST + 6.77) / (81.77) *Equation 15*

2. Calculate 'K' factor at formation temperature, FTEMP:

K = 60+(0.133*FTEMP) *Equation 16*

3. Calculate equivalent mud filtrate resistivity, Rmfe, and equivalent formation brine resistivity, Rwe, ratio from SP log and 'K':

Rmfe/Rwe = 10**(-SP/K) *Equation 17*

4. Calculate equivalent mud filtrate resistivity, Rmfe:

If Rmf75 is less than or equal to 0.1:

Rmfe = (146 * Rmf75 - 5) / (337 * Rmf75 + 77) *Equation 18*

If Rmf75 is greater than 0.1:

Rmfe: 0.85 * Rmf75 *Equation 19*

5. Calculate equivalent formation brine resistivity, Rwe, from equivalent mud filtrate resistivity, Rmfe, and Rmfe/Rwe ratio:

Rwe = Rmfe / (Rmfe/Rwe) *Equation 20*

6. Calculate Rw @ 75 °F:

If Rwe is less than or equal to 0.12:

Rw75 = (77 * Rwe + 5) / (146 - 377 * Rwe) *Equation 21*

If Rwe is greater than 0.12:

Rw75 = - (0.58 – 10^(0.69 * Rwe - 0.24)) *Equation 22*

7. Calculate salinity in ppm from formation brine resistivity, Rw at 75 °F, Rw75:

Salinity (ppm) = 10^((3.562 - LOG10(Rw75 - 0.0123)) / 0.955) *Equation 23*

Claimed as PBI [redacted]

2.10.3.4 Stratigraphic Well Fluid Sample Results

The results of the fluid sampling in the stratigraphic well are provided in Table 2-30. Ten formation fluid samples were attempted to be collected, with seven successfully obtained. Claimed as PBI [redacted]

2.11 Seismic Risk and Fault-Slip Potential for AoR

The Project area is reported by USGS to be of very low seismic hazard (low peak acceleration [4 to 6%g] seismic hazard, i.e., a 2% chance in 50 years of peak ground acceleration at 4 to 6%g, acceleration of gravity). The seismic hazard determination by USGS is shown on Figure B-82 (USGS, 2023). In addition, there have been no recorded earthquakes in the vicinity of the

Project area since 1973, based on a search of the USGS national earthquake database. The injection pressures will be limited to values that reduce the potential for the initiation or propagation of fractures. No induced seismicity is expected to occur under the proposed permit conditions. The following evaluations were conducted to provide a site-specific technical evaluation of the seismic risk within the AoR.

Four faults were identified within the AoR. The fault-slip potential was assessed using two approaches, including a deterministic 3D approach and a probabilistic approach.

The first approach was based on an Integrated Pore Pressure Prediction estimate of the stress gradients and the pore pressure increase at fault-formation interfaces. The modeled output is the approximated pore pressure needed for the fault to slip at each point on the fault. [redacted] he amount of pore pressure required for fault slip is defined as the horizontal distance between the Mohr circle and the failure line. By constraining the stress state and pore pressure at each location along the fault based on regional leak-off test data (Shmin), integration of the density log (Sv), as well as the fault geometry (fault dip and fault strike), the critical pore pressure for fault slip can be computed by assuming a constant friction coefficient (approximately 0.6 or 0.7) for faults.

This methodology neglects poro-elastic stresses due to the rock frame deformation and assumes that the regional stresses are representative of the stresses at the fault location. The resulting deterministic approach indicates that injection activities would have to increase pore pressures by more than 400 psi at the shallower Fleming injection intervals to potentially induce fault slip. The current estimate of the maximum pore pressure increase anywhere in the injection zone, based on the simulation model, is less than 180 psi, indicating that the potential for induced seismic risk based on this methodology is low.

Figure B-83 show the estimated pore pressure increase required to induce a fault slip along mapped faults within and surrounding the AoR. The pore pressure increase along each fault trace is below the fault-slip criterion. In addition, Figure B-83 shows the modeled pore pressure changes over time based on the CO2 injection simulation results.

The second method used a probabilistic approach regarding theoretical faults. This approach was used prior to the drilling of the stratigraphic well, after which the deterministic case was updated. In the probabilistic approach, theoretical faults were assumed to occur in many random strike (0 to 360 degrees) and dip (30 to 90 degrees) angles to account for the likely scenarios. Other inputs included the depth of the injection interval and high and low side stress gradient ranges derived from the Integrated Pore Pressure Prediction analysis, and regional maximum horizontal stress direction (80 degrees +/- 10 degrees) (Lund Snee and Zoback, 2020). Both shallow and deep case probabilistic analyses were performed. The shallow case was estimated to be the more limiting of the two scenarios, based on the shallower depth of the Fleming injection intervals and was deemed to be a conservatively high estimate of fault-slip potential.

[redacted] the estimated pore pressure in the shallow scenario needed to induce slip along a fault trace was

greater than 500 psi for a fault at any orientation. This is shown on Figure B-84 as the difference between the modeled Mohr circle critical stress state and the failure line. Figure B-84 presents the shallow case information in graphical form. The plot on the upper right is coupled with the stereonet, demonstrating that the assumed fault orientations encompass nearly every fault orientation, including the fault strike with the lowest delta P to slip (approximately west-east orientation) at greater than 500 psi. The fault stress states also presented on Figure B-84 show that there was a range of values based on the fault orientation, but that the pressure required for the fault to slip in the hypothetical cases is in excess of 500 psi (calculated pore pressure to slippage is below the calculated fault failure line). The maximum pore pressure increase is expected to be less than 180 psi (based on simulation model results), which is much less than the 500 psi needed to potentially induce fault slip.

Based on the seismic history of the Project area and the conforming pore pressure calculations, the potential for induced seismicity from CO2 injection at the Project area is not a significant risk. Appendix I includes additional information of the methodology used to estimate the fault-slip potential within the AoR.

2.12 Site Suitability

The purpose of this subsection is to present a summary of the geologic site characterization information, as required for the Underground Injection Control Program Director to evaluate site suitability. The Project area is suitable for CO2 injection into the proposed injection intervals of the Fleming and Frio Formations. The sands within these formations exhibit high porosity and permeability that are ideal for CO2 storage and are “of sufficient areal extent, thickness porosity and permeability to receive the total anticipated volume of the CO2 stream” [40 CFR 146.83(a)(1)]. Both the UCCZ and Anahuac Shale are thick, continuous sealing intervals across the AoR and are sufficient to “contain the injected CO2 stream and displaced formation fluids and allow injection at proposed maximum pressure and volumes without initiating or propagating fractures in the confining zone” [40 CFR 146.83(a)(2)]. The following site features substantiate these conclusions.

2.12.1 Local Geology and Injection Interval Suitability

The Project area is in the Houston Embayment of the Gulf Coast Basin. The proposed injection zone extends from the top of the Fleming Sand 1 immediately below the UCCZ to the Base of the Upper Frio Sand 2. The top of the injection zone occurs at approximately 3,400 ft KB in the Project area. The Fleming stratigraphic intervals were deposited in a fluvially dominated delta system. Hyper-subsidence and collapse with periodic deposition of slope mudstones form transgressive shales are observed at the site. There are three primary sand intervals within the Fleming injection intervals, with interbedded mudstones. The Fleming Sand 1 layer exhibits a net thickness of approximately 300 to 500 ft. The Fleming Sand 2 layer exhibits a net thickness of approximately 250 to 500 ft. The Fleming Sand 3 layer exhibits a net thickness of approximately 400 to 600 ft. Claimed as PBI [redacted] The Fleming Sands are thick and continuous across the AoR. Thickness of the Fleming sand intervals (gross sand thickness) at the stratigraphic well is 471 ft, 635 ft, and 1,070 ft for the Fleming Sands 1, 2, and 3, respectively.

The lower part of the injection zone is composed of the Upper Frio Formation and is estimated to occur at approximately 6,400 ft KB in the vicinity of the injection wells. Sediments within the Frio injection interval include thick sand intervals deposited in association with a fluvially dominated delta system. Wave reworking of these deposits resulted in thick, sand-rich prograding shore-zone systems fronted by narrow, muddy shelfs. The Upper Frio Sand 1 layer exhibits a net thickness of approximately 500 ft. The Upper Frio Sand 2 layer exhibits a net thickness of approximately 250 to 400 ft. Claimed as PBI [redacted] The Upper Frio Sands are thick and continuous across the AoR. The Upper Frio Sand 1 is 1,160 ft thick and the Upper Frio Sand 2 is 715 ft thick at the stratigraphic well location.

Claimed as PBI [redacted] he analysis performed on these faults showed there to be effective sealing at the faults.

2.12.2 Summary of Storage Capacity

A geologic model was developed to assess the characteristics of the injection intervals, UCCZ, and Anahuac Shale to support plume and pressure modeling efforts. The model was created from a combination of local well logs, including lithology logs and porosity logs, core data in the region, 3D and 2D seismic, and information from publications. The model grids were upscaled from historical well data to estimate lithology, and subsequent porosity and permeability in each grid block. Over 19 million grid blocks are used in the model and the boundaries extend beyond the AoR boundary in order to accurately model the plume and pressure, without seeing boundary effects.

The CO2 injection capacity for the AoR is estimated to be 3 to 5 MMta using three injection wells with a total storage capacity of 53 MMt injected over a period of 13 years. The calculation method applied to derive this estimate is from Eclipse simulation model that integrates a best estimate of reservoir description including the environment of deposition, facies distribution, pressure and temperature data, along with field development strategy that targets reasonable storage potential. Injection capacity is primarily a function of reservoir quality (permeability and thickness), connectivity, dipping angle and channel distribution, as well as injection stage design.

2.12.3 Summary of Confining Zone(s) Suitability

The UCCZ is a thick, muddy interval in the Miocene that encompasses the Amphistegina ‘B’ marker shale. The UCCZ is thick and continuous across the AoR, with a total interval thickness ranging from approximately 400 to 500 ft near the injection wells. The top of the UCCZ is estimated to be contacted at approximately 3,000 ft KB at the injection well locations. At the stratigraphic well, the UCCZ is 538 ft thick and occurs at -2,922 ft true vertical depth subsea (TVDSS).

The Anahuac Shale overlies the Upper Frio Formation and offers confinement above the Upper Frio injection interval. The Anahuac is a thick and continuous shale bed in the region, including the AoR. The Anahuac is approximately 350 to 440 ft thick within the AoR, with both log and seismic character that is easily identifiable in all of the data that were reviewed. The top of the Anahuac is estimated to be between 6,000 and 6,100 ft TVDSS at the injection well locations. At the stratigraphic well, the Anahuac Shale was estimated to be 409 ft thick and the top of the Anahuac Shale occurs at 6,054 ft TVDSS.

The LCZ is a very thick Frio Shale package that is several thousand ft thick and the base is often below the total depth of most of the exploration wells in the area.

2.12.4 Summary of CO_2 Stream Compatibility and Suitability

A series of geochemical reaction scenarios were modeled using information collected from the stratigraphic test well to generate insights into how the subsurface confining and injection formations could respond to CO_2 sequestration. The mineralogy and brine chemistry information collected from the stratigraphic well captured the major geochemical constraints that will measure the porosity changes. Evaluation of these results show that expected variations in the mineralogy of the confining and injection formations will affect the subsurface response to CO_2 sequestration by generating slight, variable degrees of mineral precipitation and dissolution. The reasonable range of conditions projected for the system will likely result in no significant changes in pore space because of dissolution or precipitation.

TABLES

Table 2-1: Bead Farm Co. #1 Wireline Logging Program

Section	Open Hole/Cased Hole	Log Title
Surface	Open Hole	GR-CAL-RES-SP
Production	Open Hole	SGR-NEU-DEN-NMR-RES
Production	Open Hole	Dipole Sonic-Resistivity Imager-Ultrasonic Imager
Production	Open Hole	Formation Pressures and Fluid Samples
Production	Open Hole	Rotary Sidewall Cores
Production	Cased Hole	GR-CCL-TEMP-CBL-Ultrasonic Cement Evaluation

Table 2-2: Bead Farm Co. #1 Proposed Coring Program

Top Core Depth (ft. KB)	Formation(s)
3,092	Upper Confining Zone – Amph 'B'
4,060	Injection Zone – Intra-Fleming Seal
4,457	Injection Interval – Fleming 2 Sand
5,186	Injection Interval – Fleming 3 Sand
6,266	Injection Zone – Anahuac Shale
7,255	Injection Interval – Upper Frio Sand

Table 2-2b: Bead Farm Co. #1 Cored Intervals

Core Number	Top Core Depth (ft. KB)	Formation(s)
1 & 2	3,092–3,180 & 3,182–3,204	Upper Confining Zone – Amph 'B'
3	4,060–4,120	Injection Zone - Intra-Fleming Seal – Fleming
4	4,456–4,488	Injection Interval – Fleming 2 Sand
5 & 6	5,186–5,200 & 5,215–5,232	Injection Interval – Fleming 3 Sand
7	6,266–6,302	Anahuac Shale
8	7,255–7,308	Injection Interval – Upper Frio Sand

Table 2-2c: Bead Farm Co. #1 Recovered Rotary Sidewall Core Samples

Core Depth (ft. KB)	Formation(s)
2,998	Confining Zone – Upper Composite Confining Zone
3,027	Confining Zone – Upper Composite Confining Zone
3,040	Confining Zone – Upper Composite Confining Zone
3,059	Confining Zone – Upper Composite Confining Zone
3,070	Confining Zone – Upper Composite Confining Zone
3,367	Confining Zone – Upper Composite Confining Zone

Core Depth (ft. KB)	Formation(s)
3,400	Confining Zone – Upper Composite Confining Zone
3,412	Confining Zone – Upper Composite Confining Zone
3,428	Confining Zone – Upper Composite Confining Zone
3,471	Confining Zone – Upper Composite Confining Zone
3,506	Confining Zone – Upper Composite Confining Zone
4,182	Injection Zone – Intra Fleming Seal
4,200	Injection Zone – Intra Fleming Seal
4,257	Injection Zone – Intra Fleming Seal
4,590	Injection Interval – Fleming Sand 2
5,002	Injection Zone – Intra Fleming Seal
5,079	Injection Interval – Fleming Sand 3
5,089	Injection Interval – Fleming Sand 3
5,287	Injection Interval – Fleming Sand 3
5,426	Injection Interval – Fleming Sand 3
6,154	Injection Zone – Anahuac Shale
6,189	Injection Zone – Anahuac Shale
6,235	Injection Zone – Anahuac Shale
6,303	Injection Zone – Anahuac Shale
6,327	Injection Zone – Anahuac Shale
6,377	Injection Zone – Anahuac Shale
7,741	Injection Zone – Upper Frio Shale
8,095	Injection Interval – Upper Frio Sand 2
8,508	Confining Zone – Lower Confining Zone
8,522	Confining Zone – Lower Confining Zone
8,531	Confining Zone – Lower Confining Zone

Table 2-3: Bead Farm Co. #1 Core Analysis Program

Analysis Test Name	Description
Core GR	Gamma ray log of core
Routine Core Analysis	Includes porosity, Klinkenberg and air permeability, and grain density
Core Scanning and Description	CT scans of core, photos, lithological characterization
Relative Permeability	CO2 – Brine relative permeability testing

Analysis Test Name	Description
Capillary Pressure	MICP, Gas/Water drainage capillary pressure
Mineralogy/Petrology	XRD, x-ray fluorescence analysis, thin section analysis
Formation Compatibility	Geochemical reaction of injection and confining zone
Geomechanics	Triaxial testing, tensile strength tests, uniaxial compressibility tests
Biostratigraphy	Upper confining zone characterization
CT = computed tomography	

Table 2-4: Actual Formation Top Elevations for Stratigraphic and Injection Wells

Formation	Bead Farm Co. #1 Fm. Top Elev. (ft AMSL)	Injection Well No. 01 Fm. Top Elev. (ft AMSL)	Injection Well No. 02 Fm. Top Elev. (ft AMSL)	Injection Well No. 03 Fm. Top Elev. (ft AMSL)
Top – UCCZ	-2,922	-2,978	-3,012	-2,880
Top – Amph 'B' Shale*	-2,922	-2,978	-3,012	-2,880
Top – Fleming Sand 1	-3,460	-3,486	-3,524	-3,409
Base – Fleming Sand 1	-4,010	-3,944	-4,080	-3,942
Top- Fleming Sand 2	-4,194	-4,163	-4,258	-4,134
Base –Fleming Sand 2	-4,829	-4,851	-4,911	-4,745
Top – Fleming Sand 3	-4,975	-4,999	-5,055	-4,883
Top – Anahuac Shale	-6,054	-6,077	-6,149	-5,979
Top – Upper Frio	-6,463	-6,483	-6,563	-6,364
Base – Upper Frio Sand 1	-7,622	-7,650	-7,712	-7,537
Top – Upper Frio Sand 2	-7,718	-7,751	-7,806	-7,624
Top – LCZ	-8,432	-8,463	-8,529	-8,346
* Biostratigraphic analysis interprets the Amph 'B' occurring at the top of the UCCZ.				

Table 2-5: Formation Top Elevations, Broussard JE Jr-1, and Walter Co - 1 Type Wells

Formation	Broussard JE Jr-1 Fm. Top Elev. (ft AMSL)	Walter Co - 1 Fm. Top Elev. (ft AMSL)
Top – UCCZ	-2,964	-2,859
Top – Fleming Sand 1	-3,504	-3,237
Base – Fleming Sand 1	-3,937	-3,775
Top – Fleming Sand 2	-4,180	-4,000
Base – Fleming Sand 2	-4,873	-4,600
Top – Fleming Sand 3	-5,012	-4,715
Top – Anahuac Shale	-6,093	-5,873
Top – Upper Frio	-6,523	-6,222

Formation	Broussard JE Jr-1 Fm. Top Elev. (ft AMSL)	Walter Co - 1 Fm. Top Elev. (ft AMSL)
Base – Upper Frio Sand 1	-7,658	-7,338
Top – Upper Frio Sand 2	-7,760	-7,447
Top - LCZ	-8,463	-8,165

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Table 2-6a: XRD Data from Bead Farm Co. #1 (API: 4224532908)

Claimed as PBI

Claimed as PBI

Claimed as PBI

Claimed as PBI

Claimed as PBI

Claimed as PBI

Claimed as PBI

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Table 2-6b: Summary of XRD Data from Broussard Trust-1 (API: 4224501690)



Table 2-7: List of AoR Fault Displacement Characteristics

Claimed as PBI

Table 2-8: Fault Displacement Characteristics Beyond AoR

Claimed as PBI

Table 2-9: List of Poisson's Ratio Input Values

Claimed as PBI		
t_p	Claimed as PBI	
t_s	Claimed as PBI	
Claimed as PBI		

Table 2-10: List of Minimum Horizontal Stress Input Values

Claimed as PBI	[redacted]	[redacted]
v	Claimed as PBI	
P_p	[redacted]	Claimed as PBI [redacted]
S_V	Claimed as PBI	[redacted]
[redacted]	[redacted]	Claimed as PBI [redacted]

Table 2-11: Dynamic Elastic Moduli input values

Claimed as PBI	[redacted]	[redacted]
v	Claimed as PBI	
ρ	Claimed as PBI	[redacted]
V_s	Claimed as PBI	[redacted]
Claimed as PBI [redacted]		

Table 2-12a: Average Elastic Moduli and Poisson's Ratio

Claimed as PBI	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

Table 2-12b. Elastic Properties and Shear Strength of Sand and Shale Samples at Rose CCS Site

[redacted]	[redacted]	Claimed as PBI [redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

*Cohesion and friction angle are derived from Mohr-Coulomb analysis

Table 2-13: List of Fracture Gradients in Injection Zones

Claimed as PBI

Table 2-14: List of Fracture Gradients in Confining Zones

Claimed as PBI

Table 2-15: Summary of Maximum Bottomhole Injection Pressures

Formation	Injection Well No. 01			Injection Well No. 02			Injection Well No. 03		
	Depth (ft KB)	Max BHP (psi)	Max BHP (w/SF)	Depth (ft KB)	Max BHP (psi)	Max BHP (w/SF)	Depth (ft KB)	Max BHP (psi)	Max BHP (w/SF)
Fleming Sand 1	3,498	2,344	2,109	3,476	2,329	2,096	3,390	2,271	2,044
Upper Frio Sand 1	6,483	4,473	4,026	6,549	4,519	4,067	6,403	4,418	3,976
BHP = bottomhole pressure; SF = safety factor									

Table 2-16a: Permeability, Irreducible Water Saturation, and Capillary Pressure Bin Relationship

Claimed as PBI

Table 2-16b: Summary of MICP Test Results

Claimed as PBI

Table 2-16c: Summary of UCCZ, Fleming Shale 1, and Anahuac Shale MICP Test Results

Claimed as PBI


Claimed as PBI

Table 2-17: Summary of Variogram Analysis Values



Table 2-18: Proportion of Net to Non-net Reservoir by Percentage within Injection Zones

Claimed as PBI

Table 2-19: Injection Zone Facies Classification

Claimed as PBI

Table 2-20: Net Fraction Reservoir Facies

Claimed as PBI

Table 2-21: Average Total Porosity and Permeability

Claimed as PBI

Table 2-22: Kinetic Parameters used in Geochemical Reaction-path Models following the Rate Law Expression (Palandri and Kharaka, 2004)

Claimed as PBI

Table 2-23a: XRF Determined Elemental Composition of Formation Samples

Claimed as PBI


Claimed as PBI

Claimed as PBI

Table 2-23b: Fluid Trace Metal Concentration Change after Sorption Modeling



Table 2-23c: Water Chemistry used in Formation-specific Geochemical Models




Claimed as PBI

Table 2-24: Representative Formation Mineralogy used in Geochemical Models

Claimed as PBI

Table 2-25: Secondary Minerals Precipitated during Injection for Each Formation

Formation	Secondary Minerals					
	Pyrophyllite	Mg-Smectite	K-Smectite	Muscovite	Dawsonite	Ankerite
UCCZ	x	x	x	x	x	x
Fleming Sand 1	x				x	
Fleming Sand 2	x	x		x	x	
Fleming Sand 3	x				x	x
Anahuac Shale	x	x		x	x	
Upper Frio	x	x		x	x	

Table 2-26: Chemical Formulae for Each Mineral used in the Geochemical Models

Mineral	Formula
Quartz	SiO2
K-feldspar	KAlSi3O8
Albite	NaAlSi3O8
Calcite	CaCO3
Dolomite	CaMg(CO3)2
Ankerite	CaFe(CO3)2
Siderite	FeCO3
Dawsonite	NaAlCO3(OH)2
Kaolinite	Al2Si2O5(OH)4
Pyrophyllite	Al2Si4O10(OH)2
Muscovite	KAl3Si3O10(OH)2
Illite	K0.6Mg0.25Al2.3Si3.5O10(OH)2
Na-Smectite	Na0.33Al2.33Si3.67O10(OH)2
Ca-Smectite	Mg0.165Al2.33Si3.67O10(OH)2
Mg-Smectite	Ca0.165Al2.33Si3.67O10(OH)2
K-Smectite	K0.33Al2.33Si3.67O10(OH)2
Pyrite	FeS2

Table 2-27: Oil and Gas Wells Used to Estimate Lowermost USDW

API	Well Name	Reference Elev. (ft AMSL)	TD (ft)	TD Form	Final Status	Operator	Field	Current Operator
4224500123	1 KOLANDER ETAL UN A	40 (GL)	8,515	000UNKWN	D&A	SUN OIL CO	WILDCAT	SUN OIL CO
4224531310	1 WESTBURY FARMS	59.6 (KB)	16,568	652EOCN	ABD-GW	TEXACO INC	CONSTITUTION	MILAGRO EXPLORATION LLC
4224500507	6 G MCMUNN FITZGERALD	33 (DF)	8,431	000UNKWN	TA-GAS	HUMBLE OIL & REFINING CO	AMELIA	EXXON CO U S A
4224502202	1 BURRELL FRANK	25 (GL; est)	8,727	000UNKWN	ABD-GW	PAN AMERICAN	GILBERT RANCH	AMOCO PRODUCTION CO
4224502238	1 GILBERT ESTATE J N	34 (DF)	10,719	000UNKWN	D&A	CHAVANNE H J	WILDCAT	CHAVANNE H J
4224500097	1 BEAVERS ANNIE	25 (GL; est)	8,504	000UNKWN	D&A	SUN OIL CO	NOME	SUN OIL CO
4224502193	BROUSSARD JE JR-1	30 (GL; est)	9,050	000UNKWN	DRY	UNKNOWN	UNKNOWN	UNKNOWN

Notes:
TD is at measured depth in reference to the elevation datum.
DF = drill floor; ft AMSL = feet above mean seal level; GL = Ground Level; TD = total depth

Table 2-28a: Calculated TDS Based on Well-Specific Data (1 KOLANDER ETAL UN A)

API	4224500123
Well Name	1 KOLANDER ETAL UN A
GL (ft AMSL)	40
KB (ft AMSL)	--

Sand	Top (ft. mD GL)	Bottom (ft. mD GL)	Thick (ft)	Deep R (ohmm)	Temp, °C	Temp, °F	Por, Calc	Calc. Rw	Rw77	SCw77	Calculated TDS, (Young et al., 2016)
1	1,335	1,400	65	4.7	31.2	88.2	35.3%	1.21	1.38	7,266	4,200
2	1,421	1,438	17	4.4	31.7	89.1	35.2%	1.13	1.30	7,712	4,500
3	1,590	1,610	20	3.0	33.1	91.6	35.1%	0.77	0.90	11,090	6,400
2	1,725	1,745	20	2.0	34.2	93.6	34.9%	0.51	0.61	16,387	9,500
3	1,850	1,877	27	1.8	35.3	95.5	34.8%	0.46	0.56	17,954	10,400

*Bottom log interval = 1,938'; lowermost sand on log calculated.
GL = Ground Level; ohmm = ohm-meter

Table 2-28b: Calculated TDS Based on Well-Specific Data (1 WESTBURY FARMS)

API	4224531310
Well Name	1 WESTBURY FARMS
GL (ft AMSL)	34.6
KB (ft AMSL)	59.6

Sand	Top (ft. mD KB)	Bottom (ft. mD KB)	Thick (ft)	Deep R (ohmm)	Temp, °C	Temp, °F	Por, Calc	Calc. Rw	Rw77	Cw77	Calculated TDS, (Young et al., 2016)
1	1,305	1,328	23	6.0	30.8	87.4	35.3%	1.55	1.74	5,731	3,300
2	1,420	1,440	20	5.0	31.7	89.1	35.2%	1.29	1.47	6,785	3,900
3	1,465	1,480	15	5.2	32.1	89.7	35.2%	1.34	1.54	6,493	3,800
4	1,520	1,530	10	2.7	32.5	90.5	35.1%	0.69	0.80	12,430	7,200
5	1,585	1,675	90	1.5	33.4	92.1	35.1%	0.38	0.45	22,077	12,800
6	1,700	1,720	20	1.7	34.0	93.2	34.9%	0.43	0.52	19,332	11,200
7	1,915	1,935	20	1.7	35.8	96.4	34.7%	0.43	0.53	18,888	11,000
8	1,990	2,002	12	1.3	36.4	97.5	34.7%	0.33	0.41	24,521	14,200
9	2,092	2,170	78	0.8	37.5	99.5	34.5%	0.20	0.25	39,249	22,800
10	2,338	2,382	44	1.1	39.4	102.8	34.3%	0.27	0.36	27,923	16,200

GL = Ground Level; ohmm = ohm-meter

Table 2-28c: Calculated TDS Based on Well-Specific Data (6 G MCMUNN FITZGERALD)

API	4224500507
Well Name	6 G MCMUNN FITZGERALD
GL (ft AMSL)	20
KB (ft AMSL)	33 (DF)

Sand	Top (ft. mD DF)	Bottom (ft. mD DF)	Thick (ft)	Deep R (ohmm)	Temp, °C	Temp, °F	Por, Calc	Calc. Rw	Rw77	Cw77	Calculated TDS, (Young et al., 2016)
1	1,040	1,062	22	3.9	28.6	83.5	35.6%	1.02	1.10	9,110	5,300
2	1,147	1,152	5	2.6	29.4	85.0	35.5%	0.68	0.74	13,502	7,800
3	1,179	1,191	12	2.6	29.7	85.5	35.5%	0.68	0.74	13,441	7,800
4	1,260	1,275	15	2.2	30.4	86.7	35.4%	0.57	0.64	15,724	9,100
5	1,317	1,335	18	2.5	30.9	87.6	35.3%	0.65	0.73	13,739	8,000
6	1,412	1,440	28	1.3	31.7	89.0	35.2%	0.33	0.38	26,106	15,100
7	1,460	1,480	20	1.2	32.1	89.7	35.2%	0.31	0.36	28,141	16,300
8	1,548	1,562	14	1.1	32.8	91.0	35.1%	0.28	0.33	30,404	17,600
9	1,662	1,690	28	1.0	33.7	92.7	35.0%	0.26	0.30	32,984	19,100
10	1,702	1,733	31	0.8	34.1	93.4	34.9%	0.20	0.24	41,038	23,800
11	1,890	1,920	30	0.7	35.6	96.1	34.8%	0.18	0.22	45,961	26,700
12	1,932	1,960	28	0.7	36.0	96.7	34.7%	0.18	0.22	45,764	26,500
13	1,987	2,020	33	0.6	36.4	97.6	34.7%	0.15	0.19	53,066	30,800

DF = drill floor; GL = Ground Level; ohmm = ohm-meter

Table 2-28d: Calculated TDS Based on Well-Specific Data (1 BURRELL FRANK)

API	4224502202
Well Name	1 BURRELL FRANK
GL (ft AMSL)	25 (est.)
KB (ft AMSL)	--

Sand	Top (ft. mD GL)	Bottom (ft. mD GL)	Thick (ft)	Deep R (ohmm)	Temp, °C	Temp, °F	Por, Calc	Calc. Rw	Rw77	Cw77	Calculated TDS, (Young et al., 2016)
1	720	750	30	3.9	26.0	78.8	35.9%	1.03	1.05	9,496	5,500
2	840	900	60	3.0	27.1	80.8	35.8%	0.79	0.83	12,116	7,000
3	1,015	1,040	25	2.7	28.4	83.2	35.6%	0.71	0.76	13,198	7,700
4	1,308	1,322	14	3.1	30.8	87.4	35.3%	0.80	0.90	11,096	6,400
5	1,345	1,360	15	2.3	31.1	88.0	35.3%	0.59	0.67	14,888	8,600
6	1,412	1,435	23	2.4	31.7	89.0	35.2%	0.62	0.71	14,146	8,200
7	1,510	1,520	10	1.9	32.4	90.4	35.1%	0.49	0.57	17,685	10,300
8	1,660	1,673	13	1.2	33.7	92.6	35.0%	0.31	0.36	27,523	16,000
9	1,690	1,708	18	1.1	33.9	93.1	35.0%	0.28	0.33	29,914	17,400
10	1,750	1,763	13	1.2	34.4	93.9	34.9%	0.31	0.37	27,251	15,800
11	1,830	1,850	20	0.9	35.1	95.2	34.8%	0.23	0.28	36,003	20,900
12	1,875	1,895	20	0.9	35.5	95.8	34.8%	0.23	0.28	35,830	20,800
13	1,912	1,922	10	0.8	35.7	96.3	34.7%	0.20	0.25	40,179	23,300
14	1,955	1,968	13	0.8	36.1	97.0	34.7%	0.20	0.25	39,989	23,200

GL = Ground Level; ohmm = ohm-meter

Table 2-28e: Calculated TDS Based on Well-Specific Data (1 GILBERT ESTATE J N)

API	4224502238
Well Name	1 GILBERT ESTATE J N
GL (ft AMSL)	--
KB (ft AMSL)	34 (DF)

Sand	Top (ft. mD DF)	Bottom (ft. mD DF)	Thick (ft)	Deep R (ohmm)	Temp, °C	Temp, °F	Por, Calc	Calc. Rw	Rw77	Cw77	Calculated TDS, (Young et al., 2016)
1	1,190	1,202	12	2.5	29.8	85.7	35.5%	0.65	0.72	13,959	8,100
2	1,242	1,265	23	2.2	30.3	86.5	35.4%	0.57	0.63	15,749	9,100
3	1,288	1,302	14	1.9	30.6	87.1	35.4%	0.49	0.55	18,147	10,500
4	1,408	1,420	12	1.8	31.6	88.9	35.2%	0.46	0.53	18,887	11,000
5	1,477	1,490	13	1.5	32.2	89.9	35.2%	0.39	0.44	22,481	13,000
6	1,500	1,540	40	1.2	32.5	90.4	35.1%	0.31	0.36	27,969	16,200
7	1,558	1,570	12	1.3	32.8	91.1	35.1%	0.33	0.39	25,701	14,900
8	1,590	1,610	20	1.2	33.1	91.6	35.1%	0.31	0.36	27,726	16,100
9	1,928	1,940	12	0.7	35.9	96.5	34.7%	0.18	0.22	45,835	26,600

DF = drill floor; GL = Ground Level; ohmm = ohm-meter

Table 2-28f: Calculated TDS Based on Well-Specific Data (1 BEAVERS ANNIE)

API	4224500097
Well Name	1 BEAVERS ANNIE
GL (ft AMSL)	25 (est.)
KB (ft AMSL)	--

Sand	Top (ft. mD GL)	Bottom (ft. mD GL)	Thick (ft)	Deep R (ohmm)	Temp, °C	Temp, °F	Por, Calc	Calc. Rw	Rw77	Cw77	Calculated TDS, (Young et al., 2016)
1	570	645	75	3.3	25.0	77.0	36.1%	0.88	0.88	11,412	6,600
2	760	850	90	2.8	26.6	79.9	35.9%	0.74	0.76	13,087	7,600
3	970	995	25	2.2	28.1	82.5	35.7%	0.58	0.61	16,291	9,400
4	1,094	1,110	16	2.3	29.0	84.3	35.5%	0.60	0.65	15,350	8,900
5	1,170	1,190	20	2.0	29.7	85.4	35.5%	0.52	0.57	17,481	10,100
6	1,202	1,225	23	2.0	30.0	85.9	35.4%	0.52	0.57	17,408	10,100
7	1,260	1,270	10	1.6	30.4	86.7	35.4%	0.41	0.46	21,629	12,500
8	1,470	1,485	15	1.3	32.1	89.8	35.2%	0.33	0.39	25,956	15,100
9	1,510	1,540	30	1.0	32.5	90.5	35.1%	0.26	0.30	33,550	19,500
10	1,590	1,610	20	1.0	33.1	91.6	35.1%	0.26	0.30	33,271	19,300
12	1,622	1,645	23	0.9	33.4	92.1	35.0%	0.23	0.27	36,826	21,400
13	1,672	1,693	21	0.7	33.8	92.8	35.0%	0.18	0.21	47,092	27,300
14	1,770	1,870	100	0.4	34.9	94.9	34.9%	0.10	0.12	81,060	47,000

GL = Ground Level; ohmm = ohm-meter

Table 2-28g: Calculated TDS Based on Well-Specific Data (BROUSSARD JE JR-1)

API	4224502193
Well Name	BROUSSARD JE JR-1
GL (ft AMSL)	30 (est.)
KB (ft AMSL)	--

Sand	Top (ft. mD GL)	Bottom (ft. mD GL)	Thick (ft)	Deep R (ohmm)	Temp, °C	Temp, °F	Por, Calc	Calc. Rw	Rw77	Cw77	Calculated TDS, (Young et al., 2016)
1	1,200	1,220	20	7.7	29.9	85.9	35.4%	2.00	2.21	4,524	2,600
2	1,280	1,310	30	4.5	30.6	87.1	35.4%	1.16	1.31	7,660	4,400
3	1,360	1,383	23	3.7	31.2	88.2	35.3%	0.95	1.08	9,232	5,400
4	1,530	1,555	25	1.8	32.6	90.8	35.1%	0.46	0.54	18,603	10,800
5	1,665	1,680	15	1.4	33.7	92.7	35.0%	0.36	0.42	23,575	13,700
6	1,705	1,730	25	1.3	34.1	93.4	34.9%	0.33	0.40	25,257	14,600
7	1,845	1,865	20	0.7	35.2	95.4	34.8%	0.18	0.22	46,215	26,800

GL = Ground Level; ohmm = ohm-meter

Table 2-29: Lowermost USDW Depths based on Water Quality Calculations for Selected Wells

API	Reference Elev (ft AMSL)	Base of USDW (Log Depth, ft)	Lowermost USDW Base Depth (ft AMSL)
4224500123	40 (GL)	1,750	-1,710
4224531310	59.6 (KB)	1,530	-1,470
4225400507	33 (DF)	1,335	-1,302
4224502202	25 (GL; est)	1,470	-1,445
4224502238	34 (DF)	1,265	-1,231
4224500097	25 (GL; est)	1,110	-1,085
4224502193	30 (GL; est)	1,383	-1,353
DF = drilling floor; ft AMSL = feet above mean seal level; GL = ground level			

Table 2-30: Stratigraphic Well Fluid Sample Results



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Underground Injection Control – Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

SECTION 3 – AREA OF REVIEW AND CORRECTIVE ACTION PLAN

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage LLC

May 2025

SECTION 3 – AREA OF REVIEW AND CORRECTIVE ACTION PLAN

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Appendix C – AoR Maps and Corrective Action Well Schematics

Appendix C-1: Bead Farm Co. #1, Rose Stratigraphic Well Corrective Action Schematic

Appendix C-2: Broussard JE Jr-1 Well Corrective Action Schematic

Appendix C-3: Broussard J.E. Etal Well Schematic

Appendix C-4: Drone Aeromagnetic Survey of the Cheek Property: Beaumont, Texas for ExxonMobil by Sander Geophysics Limited (September 2023)

Appendix C-5: Artificial Penetration Records

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3.0 Area of Review and Corrective Action Plan

ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) is submitting this Underground Injection Control (UIC) Class VI Permit Application (Application) to the United States Environmental Protection Agency (EPA) for the Rose Carbon Capture and Storage (CCS) Project (Project). ExxonMobil is undertaking the Project in Jefferson County, Texas to sequester a maximum of five million metric tonnes per annum (MMta) of carbon dioxide (CO2) using three injection wells over an injection period of up to 13 years. The predicted total CO2 storage is 53 million metric tonnes. The Area of Review (AoR) and Corrective Action Plan was prepared to meet the requirements of Code of Federal Regulations, Title 40, Section 146.84(b) [40 CFR 146.84(b)] and Texas Administrative Code, Part 1 Title 16 Chapter 5.

No significant risk to underground sources of drinking water (USDW) was identified because the confining zone characteristics are consistent with the requirements of 40 CFR 146.82(a)(3)(iii) for confining the CO2 plume. Two artificial penetrations are located within the refined AoR that require corrective action. The two artificial penetrations, which cross the upper composite confining zone (UCCZ), have been addressed in advance of CO2 injection. One of the artificial penetrations (Bead Farm Co. #1) has been plugged across the UCCZ and subsequently converted to an above-zone monitor for collection of fluid samples above the UCCZ.

ExxonMobil is pursuing individual Class VI permits to convert for three injection wells. Given the close proximity of the injection wells for the Project, ExxonMobil plans to obtain approval from the UIC Program Director to delineate the AoR and prepare the Corrective Action Plan to represent the collective effects of the three injection wells within Project AoR. Although the effects were evaluated in the collective, the required maps showing the delineated AoR and the Corrective Action Plan for artificial penetrations are submitted separately for each well so that they may be incorporated into each injection well's Class VI permit.

3.1 Objectives

A comprehensive modeling and evaluation effort was undertaken to accomplish the following objectives, consistent with the requirements of 40 CFR 146.84(b):

- Predict the extent of the CO2 plume and pressure front, which form the basis for the AoR using computational modeling and identify all wells that require corrective action [40 CFR 146.84(c)];
- Provide a plan to perform the required corrective action on artificial penetrations in the AoR [40 CFR 146.84(d)] that could threaten USDW;
- Support the development of effective monitoring strategies for the Testing and Monitoring Plan by identifying the locations where groundwater quality or pressure monitoring should be performed;
- Help direct emergency response planning by identifying potential vulnerable areas within or near the AoR that could require consideration when implementing an emergency response;
- Ensure that the Emergency and Remedial Response Plan and financial responsibility demonstration account for the most recently approved AoR [40 CFR 146.84(f)];
- Provide a guide for periodic AoR reevaluations to informed site management and monitoring over the lifecycle of the injection Project [40 CFR 146.84(e)]; and

- Retain modeling inputs and data used to support AoR reevaluations for 10 years [40 CFR 146.84(g)].

3.2 Facility Information

The following facility information is provided to specify the names and locations of the three injection wells.

Geologic Sequestration Project name:	ExxonMobil Low Carbon Solutions Onshore Storage LLC – Rose Carbon Capture and Storage Project

Injection Well Information:

Well Name and Number	Labelle Properties Ltd #1 (**Rose CCS Project Injection Well No. 01)**
County	Jefferson
Location (RR D, S, A)	Railroad District 3, Section 42, Abstract 874
Latitude / Longitude (NAD83)	29.999678 / -94.285108
American Petroleum Institute	4224532913

Well Name and Number	Bead Farm Co. #2 (**Rose CCS Project Injection Well No. 02)**
County	Jefferson
Location (RR D, S, A)	Railroad District 3, Section 41, Abstract 266
Latitude / Longitude (NAD83)	29.991017 / -94.298036
American Petroleum Institute	4224532911

Well Name and Number	Bead Farm #3 (**Rose CCS Project Injection Well No. 03)**
County	Jefferson
Location (RR D, S, A)	Railroad District 3, Section 8, Abstract 658
Latitude / Longitude (NAD83)	30.011778 / -94.297858
American Petroleum Institute	4224532912

3.3 Derivation of Input Parameter Values for Geologic Properties

ExxonMobil recognizes that parameter values for the prediction of the AoR are to be based on site-specific data to the extent possible. A stratigraphic well (Bead Farm Co. #1; American Petroleum Institute [API] 4224532908) was completed and core samples were collected from the well to obtain the necessary site geologic characterization data for the CO2 plume model. Additionally, where appropriate, the parameter values were estimated from standard values published for similar rock types and relationships in the scientific literature. As outlined below, ExxonMobil derived initial estimates of formation intrinsic permeability, porosity, relative permeability, compressibility, fluid viscosity, and fluid density from the available information, with emphasis on the available stratigraphic well data and test results, as appropriate.

The site-specific characteristics that make the Project site ideal for carbon sequestration are described in Section 2.12 of Section 2 – Site Characterization. In summary, the sands of the Fleming and Frio Formations exhibit high porosity and permeability that are ideal for CO2 storage and are “of sufficient areal extent, thickness porosity and permeability to receive the total anticipated volume of the carbon dioxide stream” [40 CFR 146.83(a)(1)]. Both the UCCZ and Anahuac Shale are thick, continuous sealing intervals across the AoR and are sufficient to “contain the injected carbon dioxide stream and displaced formation fluids and allow injection at proposed maximum pressure and volumes without initiating or propagating fractures in the confining zone” [40 CFR 146.83(a)(2)].

3.3.1 Porosity and Permeability

Porosity information was obtained from 16 well logs within the geologic model of the area of interest, which includes the AoR and a significant area surrounding the AoR. This information was utilized to generate a three-dimensional geologic model for the Project area. Most of the porosity data were provided based on compressional sonic data. Some bulk density data were also used to inform the estimates of porosity for the formations. Porosity and permeability data were gathered from the stratigraphic well (Bead Farm Co. #1) and incorporated into the geologic model for the Project area.

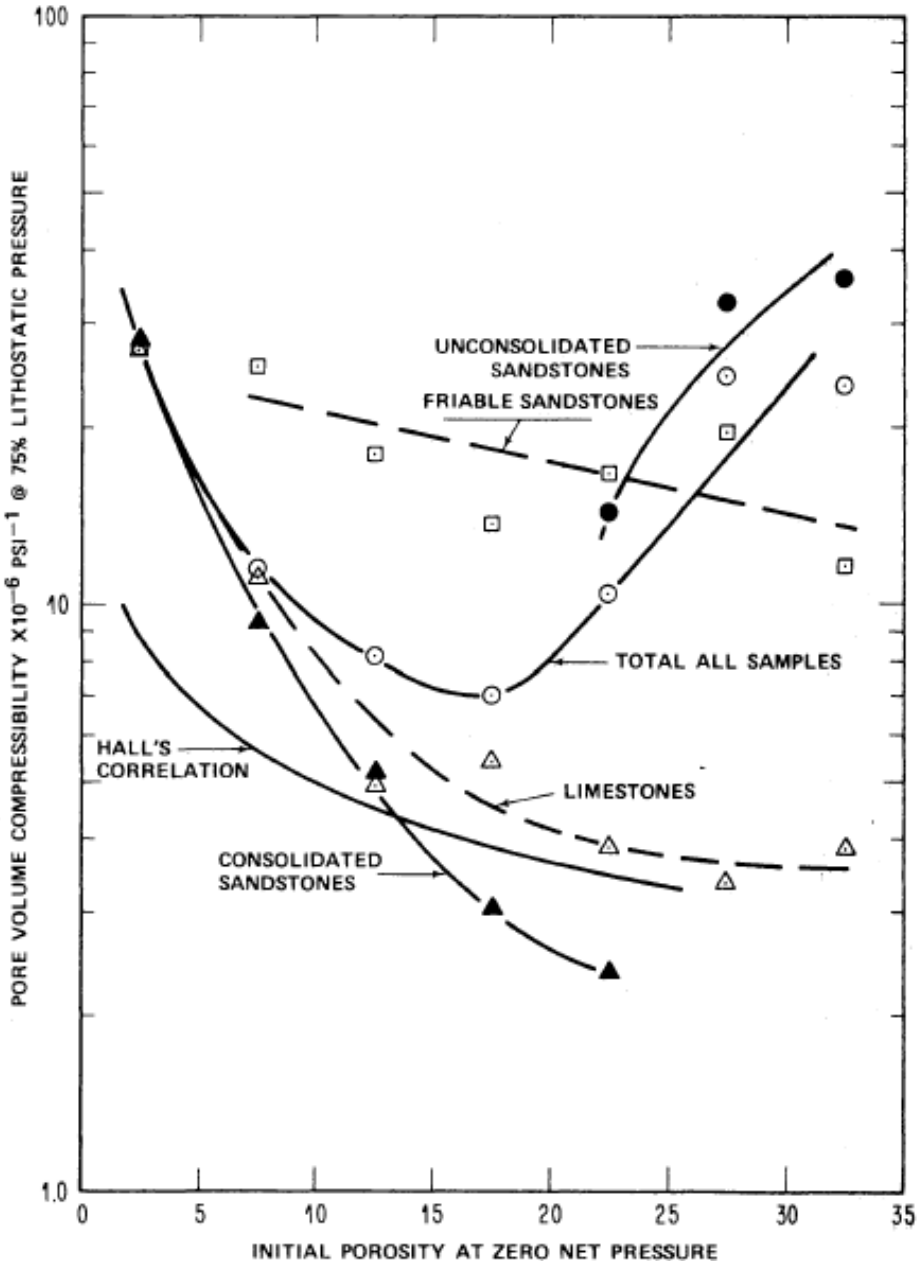
Permeability was modeled based on the results of the total porosity estimate calculations. Separate porosity-permeability transforms were developed for the Fleming and Frio. The nuclear magnetic resonance log was calibrated against core from the stratigraphic well and used to define porosity-permeability relationships across the range of net reservoir facies to address limitations in the core analyses. This relationship was then upscaled using Swanson’s mean to account for differences between core, log, and model scales (Delfiner, 2007).

The results presented below reflect a site-specific set of properties that extend beyond the predicted extent of the CO2 plume and the AoR boundary. The results of the model continue to demonstrate, as did the initial model effort, how the sequestration of CO2 is protective of USDWs.

3.3.2 Rock Compressibility

Based on the rock compressibility measurements for the sandstone samples collect at the stratigraphic well, an average value of Claimed as PBI [redacted]. These values are reasonably consistent with the available literature values. Figure 3-1 provides a literature-based relationship between pore volume compressibility and initial porosity. The average rock compressibility values derived from various cored intervals of the stratigraphic well are demonstrated in Figure 3-2. These values are consistent with the literature-based ranges described in Figure 3-1.

Figure 3-1: Pore Volume Compressibility as a Function of Initial Porosity



Source: Newman, 1973

Figure 3-2: Sand Compressibility Unload/Reload Above Initial Reservoir Pressure from Bead Farm Co. #1



3.3.3 Relative Permeability

Relative-permeability curves were generated based on research of analogous depositional environments. Traditional core testing has difficulty accurately measuring the endpoints of the curves, resulting in high irreducible water saturations and low CO2 endpoints (Benson et al., 2013). In drainage CO2-brine relative-permeability experiments, as water saturation decreases, capillary forces become larger [i.e., capillary pressure (P_c)] and increase rapidly in the approach to the irreducible water saturation. During the experiment, the increase in capillary forces limits further reduction in water saturation (i.e., the viscous force is too small relative to the capillary force). This causes the experimental relative-permeability measurements to end at water saturations higher than the actual irreducible water saturation. For this reason, it is recommended to fit a Corey-Brooks expression to the experimental data and to extrapolate the curve to a representative value of irreducible water saturation.



Table 3-1: Relative-Permeability Bins and Associated Parameters

Claimed as PBI

The irreducible water saturation was assumed to be in the range of 6 percent (%) to 42% based on published values for various sand qualities in the available Gulf Coast regional data. Fitting the endpoints to the experimental data resulted in brine and CO2 exponents of 5 and 2, respectively. The geologic model permeability property is based on absolute gas permeability shown on Figure 3-3.

Figure 3-3: Drainage and Imbibition Relative-Permeability Function

Claimed as PBI

The Corey function for gas and water relative permeability is defined as follows, where the Corey exponents are listed in Table 3-1 to be 2 and 5 for gas and water phases, respectively.

(Eq. 1) $$k_{rg} = k_{rg,max} \times \left(\frac{S_g - S_{gc}}{1 - S_{gc} - S_{wirr}}\right)^{n_g}$$

$$k_{rw} = k_{rw,max} \times \left(\frac{1 - S_g - S_{wirr}}{1 - S_{wirr}}\right)^{n_w}$$

$$S_{g,max} = 1 - S_{wirr}$$

The gas hysteresis behavior was incorporated into the displacement curve to account for trapped gas as a CO2 storage mechanism. The approach represents CO2 replacing water as gas saturation, and the amount of CO2 increases until it reaches maximum gas saturation. Afterwards, during the imbibition process, water drives CO2 out of the pore space and gas saturation decreases until it reaches trapped gas saturation (S_{gt}). This value can be measured through laboratory testing. The initial estimate of S_{gt} was based on available literature and the following correlation (Land, 1971):

(Eq. 2) $$C = \frac{1}{S_{gt}} - \frac{1}{S_{g,max}}$$

For the Project, a value of C = 2.2 was chosen based on published clastic rock measurements (Land, 1971). This results in an initial estimated trap gas saturation value of 0.3.

3.3.4 Capillary Pressure

Initial estimates of capillary pressure were estimated using capillary pressure functions by the Brooks-Corey capillary pressure model:

(Eq. 3) $$P_c = P_{c,th} \times {S_{wn}}^B$$

$$S_{wn} = \frac{S_w - S_{wirr}}{1 - S_{wirr}}$$

where $P_{c,th}$ is threshold (entry) capillary pressure.

A range of $0 < P_{c,th} < 3$ psi was assumed to be a reasonable quality clastic rock at reservoir conditions. The values chosen for each S_{wirr} bin are listed in Table 3-1. Exponent B is related to pore size distribution index l and estimated based on Burdine's theory:

(Eq. 4) $$B = \frac{1}{l} = -\frac{nw-3}{2}$$

In a gas-water system, the Brooks-Corey capillary pressure model (Eq. 3) indicates that the capillary pressure curves steepen as they approach the irreducible water saturation point. The five sets of capillary curves are plotted in Figure 3-4.

Figure 3-4: Capillary Pressure Functions



3.3.5 Fluid Pressure

The average formation fluid pressure gradient was derived from [redacted] formation pressure data points acquired from the stratigraphic well. The pressure gradient value is Claimed as PBI Claimed as PBI represented in Figure 3-5. This original reservoir pressure gradient was based data points collected from Claimed as PBI and was considered representative of sand intervals to be used for injection. The measured site-specific values are consistent with expected values obtained from available literature, which reported an average value of approximately 0.45 psi/ft (Kreitler, 1988).

Figure 3-5: Stratigraphic Well (Bead Farm Co. #1) Pressure Gradient



3.3.6 Temperature

Based on data collected from the stratigraphic well, the temperature gradient is Claimed as PBI Claimed as PBI Mean surface temperature was assigned as 68 °F, yielding an original temperature of Claimed as PBI in the reservoir model at a reference depth of Claimed as PBI Claimed as PBI he original temperature was assigned to be consistent with this temperature and the temperature gradient throughout the model domain. The temperature gradient is represented in Figure 3-6.

Figure 3-6: Stratigraphic Well (Bead Farm Co. #1) Temperature Gradient



3.3.7 Formation Compressibility

Total formation compressibility includes rock compressibility (Section 3.3.2) and fluid compressibility (Section 3.4.3). Both are accounted for during simulation of CO2 injection.

3.3.8 Initial Saturation

A review of the available literature (Kreitler, 1988) indicates the target Fleming and Frio injection intervals in this area of the Gulf Coast are expected to be saline aquifers of 100% water saturation. Claimed as PBI

3.4 Derivation of Input Parameter Values for Fluid Properties

3.4.1 Fluid Composition

Fluid samples were collected from the stratigraphic well and analyzed for fluid composition. The results of laboratory analyses for total salinity are summarized in Table 3-2. The simulation model utilized average salinity of Claimed as PBI at reference depth of Claimed as PBI Claimed as PBI and salinity of Claimed as PBI at reference depth of Claimed as PBI. A detailed fluid analysis is presented in Section 2.9 of Section 2 – Site Characterization.

Table 3-2: Bead Farm No.1 Fluid Sampling Results

Formation	Depth (ft)	Salinity (ppm)
Claimed as PBI		

Claimed as PBI

3.4.2 Fluid Density and Viscosity

Brine and CO2 properties (including density, viscosity, and compressibility) are functions of pressure, temperature, and salinity. Industry standard methods can be employed to determine the pure phase properties and their interaction.

For this study, a specific CO2 sequestration compositional modeling method was used that was developed by Schlumberger for the Eclipse™ numerical reservoir simulator (version 2020.4). This specific model, called CO2STORE, can accurately evaluate fluid density and viscosity based on following method in Eclipse™:

- The gas density is obtained by an accurately tuned cubic equation of state;
- The brine density is first approximated by the pure water density and then corrected for salt and CO2 effects by Ezrokhi's method (Zakirov et al., 1996); and
- The CO2 gas viscosity is calculated using methods provided by Vesovic et al. (1990) and Fenghour et al. (1998).

The dissolution of CO2 into brine and vice versa resulted in saturated CO2 and brine solutions that have slightly altered density and viscosity. A sample table for pure phase and saturated phase CO2 and brine viscosity and density are illustrated below in Table 3-3. The site-specific data were used along with the correlations and functions available in the Eclipse™ model to generate values of density and viscosity at original conditions and the projected conditions that are predicted to be generated in-situ during the course of the simulations.

Table 3-3: Pure Phase and Saturated Phase CO2 and Brine Viscosity and Density

Depth (ft)	Pressure (psi)	Temperature (°F)	Pure Phase Properties				Saturated Phase Properties			
			CO2		Brine		CO2		Brine	
			density (g/cm3)	viscosity (cp)	density (g/cm3)	viscosity (cp)	density (g/cm3)	viscosity (cp)	density (g/cm3)	viscosity (cp)
3,400	1,530	126.7	0.428	0.033	1.040	0.604	0.438	0.034	1.046	0.601
4,000	1,800	136.4	0.498	0.038	1.038	0.558	0.506	0.039	1.044	0.555
5,000	2,250	152.5	0.547	0.043	1.035	0.493	0.555	0.044	1.041	0.491
6,000	2,700	168.6	0.574	0.045	1.031	0.441	0.581	0.046	1.037	0.439
7,000	3,150	184.7	0.591	0.047	1.027	0.399	0.598	0.048	1.033	0.397
8,000	3,600	200.8	0.604	0.049	1.023	0.364	0.611	0.050	1.028	0.362
cp = centipoise; g/cm^3 = grams per cubic centimeter										

Figures 3-7(a) and 3-7(b) illustrate density variation for CO2 and brine vs. depth. CO2 and brine density vary with pressure, temperature and to a lesser extent saturation of the opposite phase (CO2 in brine or brine in CO2). CO2 density increases with pressure at deeper intervals; this density increase is partially offset by higher temperature, but the dominant control on CO2 density in this depth range is pressure. Saturation of CO2 with brine slightly increases CO2 density at all depths as shown in Figure 3-7(a). Brine density exhibits the opposite trend. At deeper intervals, brine becomes less dense with higher temperature, which is partially offset by pressure increase. Similarly, brine density increases slightly when saturated with CO2, as compared to pure phase brine. Figures 3-7(a) and (b) are illustrative; CO2 and brine density are calculated in the simulation based on local conditions (temperature, pressure, and saturation) using built-in correlations in Eclipse.

Figure 3-7(a): Pure Phase and Saturated Phase CO2 Density vs Depth

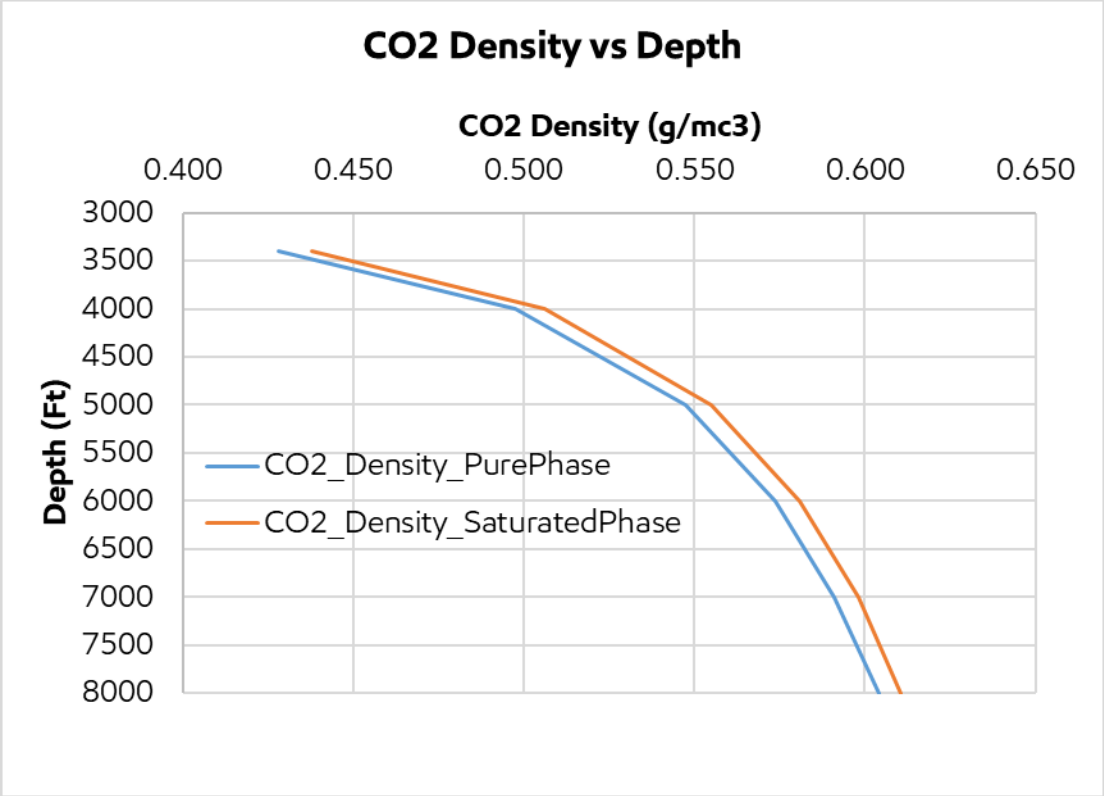
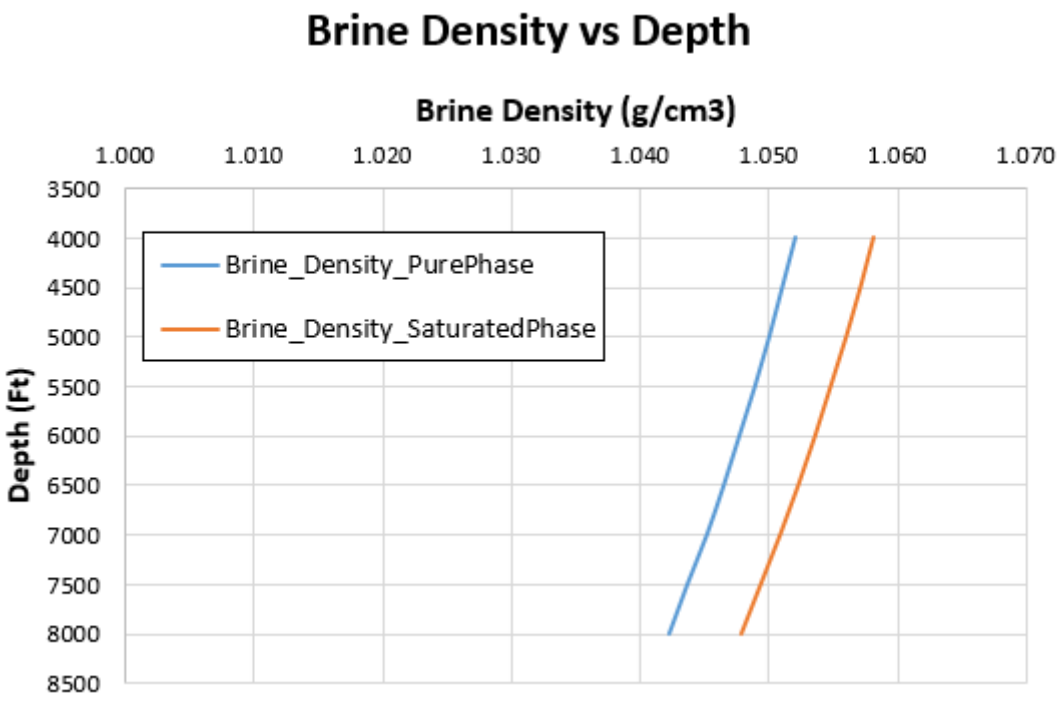


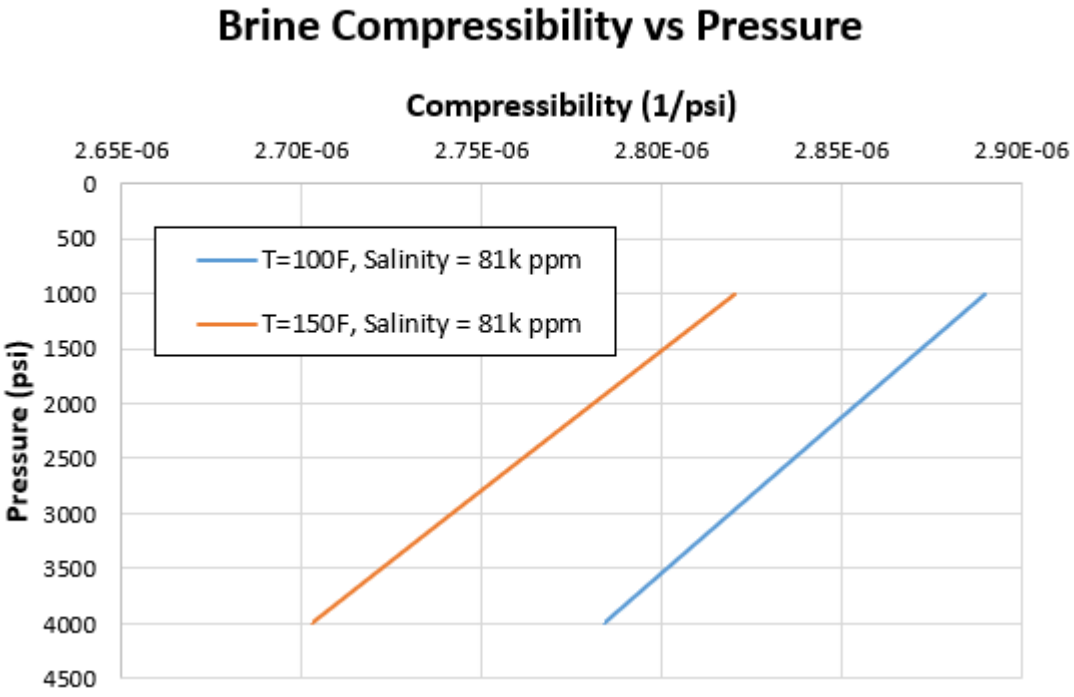
Figure 3-7(b): Pure Phase and Saturated Phase Brine Density vs Depth for Salinity = 81,000 ppm Case



3.4.3 Fluid Compressibility

Brine is often considered as an incompressible fluid but has a small compressibility in the range of 2.5 to 3.5 µsips depending on pressure and temperature. Brine compressibility is handled by the simulator based on original conditions extrapolated from the stratigraphic well measurements and predicted conditions that develop during simulation runs. The range of pressure and compressibility is illustrated on Figure 3-8. While the injected CO2 for this Project will remain in dense phase from wellhead to the reservoir, its density can vary with pressure and temperature. Compressibility of CO2 is typically higher compared to formation and brine, as illustrated in an earlier study that showed a range of 50 to 80 µsips (Law and Bachu, 1996). In this simulation study, CO2 compressibility is automatically handled by the simulator based on an equation-of-state calculation.

Figure 3-8: Brine compressibility at Different Pressure and Temperature



3.5 Derivation of Input Parameter Values for Chemical Properties

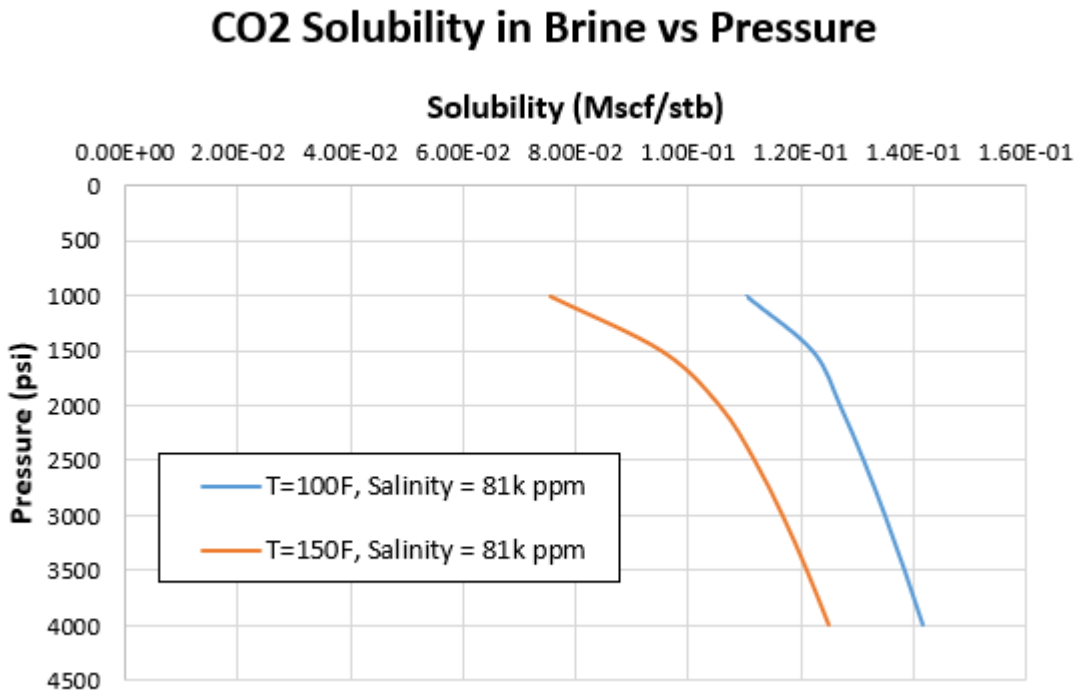
3.5.1 Aqueous Solubility

CO2 can dissolve in water and dissolved CO2 is considered permanently sequestrated in the saline aquifer. Therefore, dissolution is an important sequestration mechanism.

The compositional model leverages the CO2STORE option in the Eclipse™ simulator, which models mutual solubilities of CO2 and water based on matching experimental data for typical CO2 storage conditions: typically, 54 to 480 °F and up to 8,700 psi, which includes the pressure and temperature range for the AoR. The mutual solubilities are calculated following the procedure given by Spycher and Pruess (2009), based on fugacity equilibration between water and a CO2 phase. Water fugacity is obtained by Henry's law, while CO2 fugacity is calculated using a modified Redlich-Kwong equation of state.

A sample-calculated CO2 solubility is presented on Figure 3-9. The CO2 solubility is dependent on temperature, pressure, and salinity. As shown, CO2 has a range of solubility between 0.05 to 0.15 thousand standard cubic feet per stock tank barrel.

Figure 3-9: CO2 Solubility in Brine at Different Temperature



3.5.2 Solubility in Carbon Dioxide

The solubility of brine in CO2 at reservoir conditions is limited, which is explained in Section 3.4.2. This behavior is captured by the CO2STORE option and is incorporated into simulation forecasts. However, it has negligible impact on storage potential.

3.6 Model Design and Input Parameters

The model design is based on the use of computer simulation tools with a proven record of modeling multiphase flow. The input parameter values include a combination of uniform values throughout the domain and values that vary in space and time. The derivation of input parameter values for the hydrogeologic system were based on several data sources and relationships that were outlined above.

In addition to the set of model parameters described below, parameter sensitivity analyses were performed during the pre-operational phase and their impacts were assessed. The most impactful uncertainty parameters for CO2 plume include reservoir permeability architecture and reservoir temperature. The most impactful parameters for pressure AoR include reservoir permeability architecture, aquifer strength, vertical to horizontal permeability (k_v/k_h) ratio, fault transmissibility, and rock compressibility. Other parameters assessed include relative permeability function parameters (e.g., Corey coefficients, trapped gas saturation, capillary entry pressure) and skin, which show less impact. The following parameters were calibrated during the Rose project appraisal program: reservoir temperature, rock permeability, compressibility, and relative permeability parameters. Based on these analyses and data acquisition, the

following basis represents a best estimate for expected performance. Monitoring data collected during the life of the project will be used to calibrate the model and improve forward predictions.

3.6.1 Model Background

Schlumberger's Petrel™ Software was chosen to create a detailed geologic model for the Project. This software is used worldwide and combines information from logs and seismic data to build a sophisticated representation of the underground reservoir. The Petrel™-developed geologic model incorporates the geologic layers of the site described in the Section 2 – Site Characterization, including three targeted injection zones within the Fleming Formation (referred to as Fleming Sand 1, Fleming Sand 2, and Fleming Sand 3) and one targeted injection interval within the Frio Formation (referred to as the Upper Frio, which is a combination of Frio Sand 1 and Frio Sand 2). Using Petrel™, the properties of the injection intervals were modeled in three dimensions, a detailed description of which is given in Section 2.

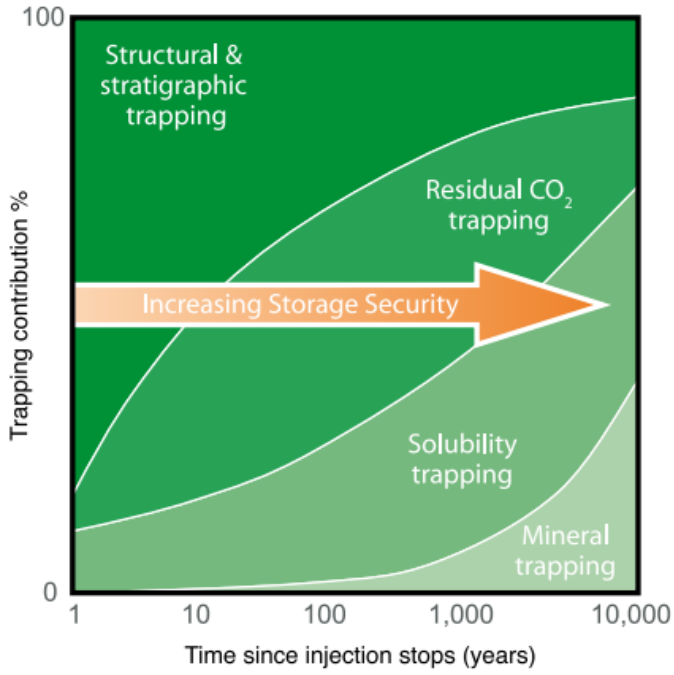
The geologic model developed in Petrel™ was used as an input into the Schlumberger Eclipse™ numerical reservoir simulator. Eclipse™ is a widely recognized tool used for modeling both compositional and unconventional reservoirs. The simulator uses advanced computational methods and equation-of-state algorithms to evaluate compositional, chemical, and geochemical processes to produce a reliable simulation for CCS. The software has modules and options specifically intended to allow the study of CCS injection activities, can handle large data sets and multiple grids, and offers various tools for data management, visualization, and uncertainty analysis.

In a CO2 storage project, four primary trapping mechanisms sequester the supercritical CO_2, schematically represented in Figure 3-10(a):

1. Structural and stratigraphic trapping
2. Residual trapping
3. Solubility trapping
4. Mineral trapping

The mineral trapping mechanism is not explicitly included in the current CCS modeling process. The results of reaction-path geochemical modeling described in Section 2.9 – Assessment of Injection Interval and Confining Zone Geochemical Reactions support that the influence of mineral precipitation/dissolution and geochemical reactions on reservoir parameters such as porosity and permeability are predicted to be negligible over the lifetime of the project. Based on these modeling results, it was not deemed necessary to conduct reactive transport modeling that considers both hydrodynamic flow and geochemical reactions. Instead, the only chemical parameters considered in the AoR model are the solubility of CO2 in the brine and the total dissolved solids of the brine, as both parameters have a larger influence on delineating the extent of the CO2 and pressure plumes. Adding geochemical reactions to the model is not expected to influence the results of the model.

Figure 3-10(a): CO_2 Storage Mechanisms



Source: Metz et al., 2005

Figure 3-10(b) shows the breakdown of the trapping mechanisms for this project. Once injection stops (Year 13), the mobile CO2 quickly decreases as CO2 migrates through pore space and is trapped. Over the life of the Rose Project, residual trapping is the most dominant trapping mechanism. Approximately 59% of the injected fluid is safely sequestered by residual trapping within the pore space. The solubility of CO2 into the connate brine will safely store approximately 35% of the CO2. The remaining 6% of the injectate will be structurally and hydrodynamically trapped.

Figure 3-10(b): Modeled Trapping Mechanisms



3.6.2 System Orientation and Simulation Controls for Model

Claimed as PBI

Figure 3-11 presents the orientation and approximate dimensions of the geologic model domain, which is greater than the simulation model grid. The domain extends significantly beyond the predicted plume boundaries to reduce the potential for the model domain boundaries to significantly influence the CO2 plume extent or pressure front migration. This grid was used consistently for the prediction of the AoR. Local grid refinement around wellbore region is also tested, which leads to substantially similar CO2 plume area and critical pressure AoR within 2 to 3% of difference.

A geologic model was used as an input to help build the dynamic plume and pressure prediction model. The initial input parameter values in Table 3-4 were used to initialize the model. The estimated average total porosity and horizontal permeability of the net reservoirs within the Fleming and Frio injection intervals are presented in Table 2-21. Claimed as PBI ertical permeability is typically lower than horizontal permeability due to the alignment of grains and bedding planes formed at time of deposition. The amount by which vertical permeability is lower can vary by stratigraphic setting and environment of deposition. For high-quality sand intervals, vertical permeability can sometimes approach the same magnitude of horizontal permeability; for lower quality sand intervals with an increased amount of silt and shale facies in the rock, the vertical permeability can be significantly lower than

horizontal permeability. In the simulation model, vertical to horizontal permeability ratio k_v/k_h is assigned based on sand quality using three permeability bins, defined in Table 3-4. The k_v/k_h ratio was assigned based on concept models of the environment of deposition supported by core analyses. High quality sand cells with Claimed as PBI generally occur in fluvial channels or delta lobes represented by blocky coarse sand (channel axis, proximal delta); cells with K_h in the range of Claimed as PBI contain sand with thin interbedded silt and shale (crevasse splay, medial delta); cells with K_h in the range of Claimed as PBI contain interbedded sand with higher content of silt and shale facies (flood plain, distal delta).

The initial pore pressure and fracture pressure gradients were calculated to be Claimed as PBI and Claimed as PBI respectively. The estimated temperature gradient is Claimed as PBI, which was calculated from measurements made at the stratigraphic well. Salinity was estimated to range from Claimed as PBI based on measurements from the stratigraphic well.

Figure 3-11: Extent of Simulation Boundary, AoR, and Geologic Features in the Model Domain

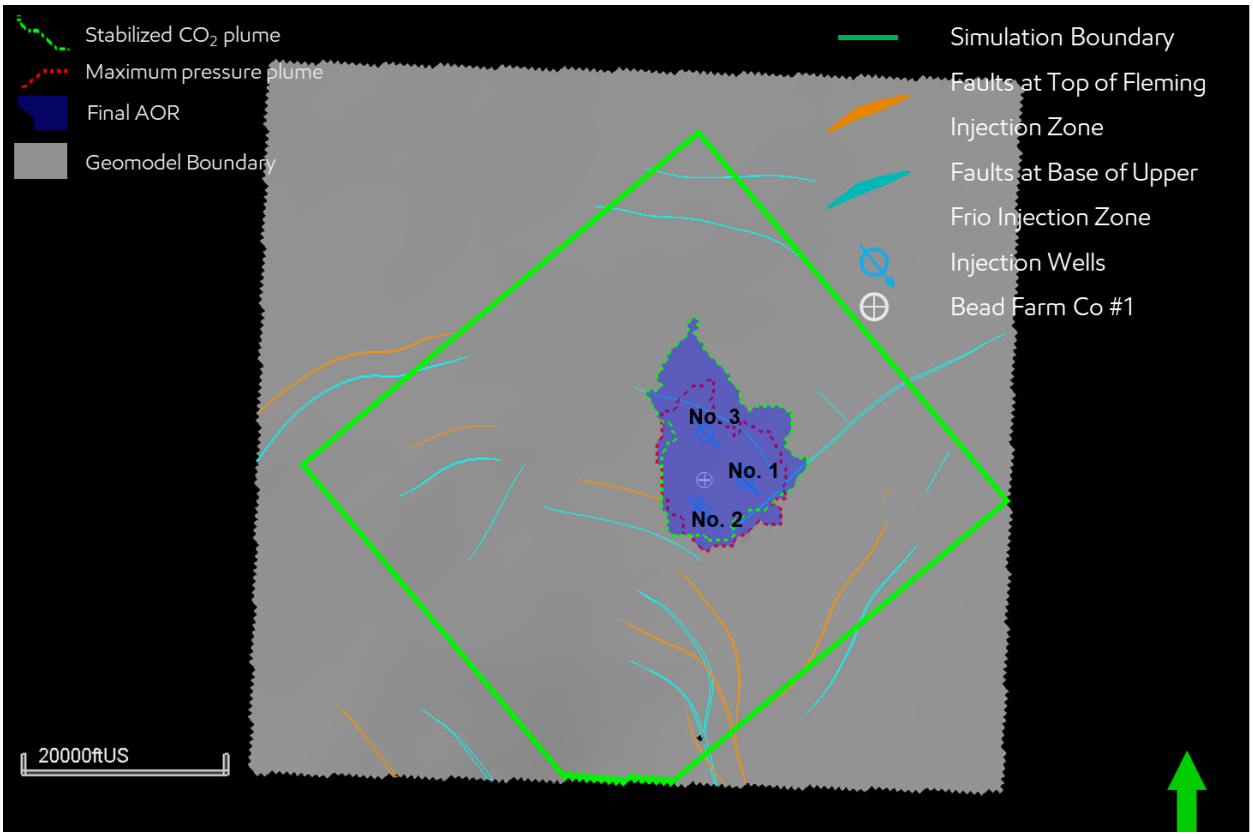


Table 3-4: Summary of Input Parameter Values for Model

Input Parameters	Value
Claimed as PBI	

Input Parameters	Value
[redacted]	Claimed as PBI [redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

3.6.3 Fluid Injection Rates

The injection wells were simulated using the wellbore design schematics and target rate schedule along with the input parameters provided in Table 3-5. The model utilized seven injection stages. Results of the core sample testing from the stratigraphic wells informed the levels of horizontal and vertical permeability. Fluid injection rates are described in Table 3-5 and the total storage volume was estimated at 46 to 53 million metric tonnes.

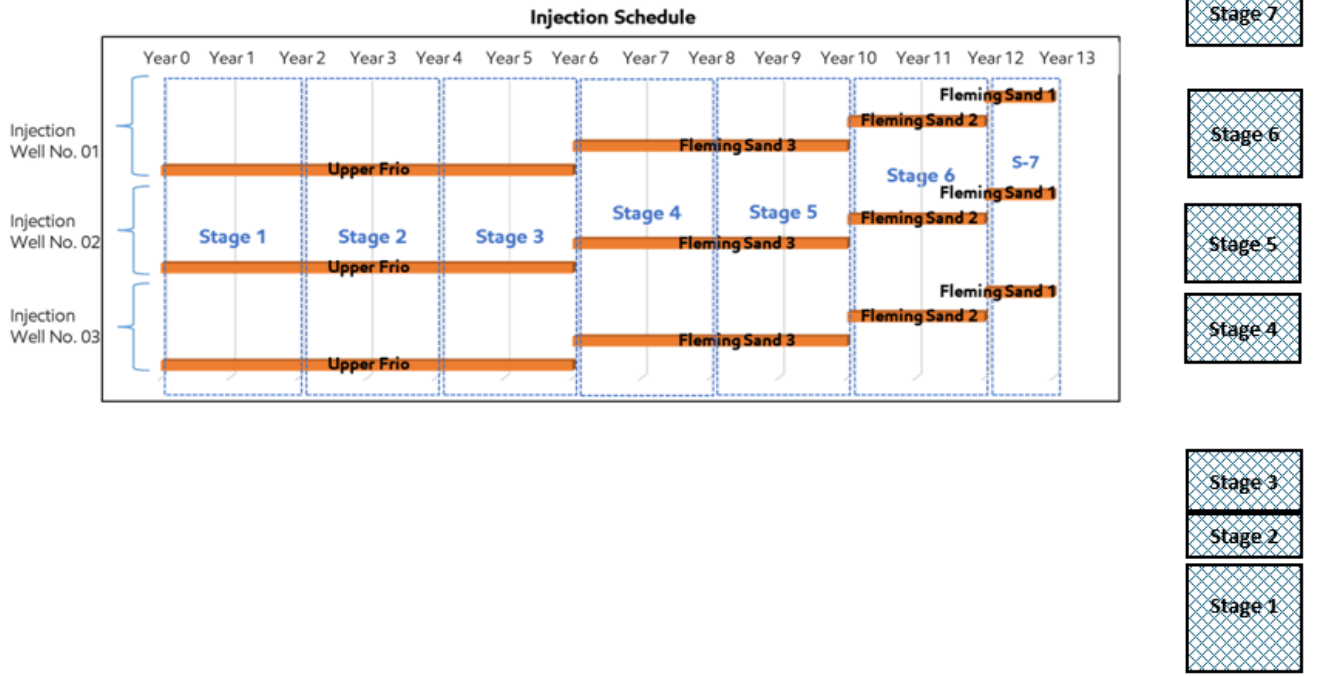
Three primary constraints were imposed to limit plume movement: (1) the maximum injection rate is 1.67 MMta; (2) a maximum bottomhole pressure (BHP) gradient of Claimed as PBI Claimed as PBI and (3) an injection period of 13 years for all three injection wells. A skin factor of 10 was applied to the wellbore to simulate potential formation damage that may occur over time. This assumption was considered when calculating the wellhead pressure. Injection Wells No. 1, 2, and 3 were simulated at a maximum injection rate of 1.67 MMta. Pressure was not a limiting factor defining the model AoR boundary projections.

Table 3-5: Summary of Input Parameter Values for Injection Wells

Input Parameter Value	Rose CCS Project Injection Wells		
	No. 1	No. 2	No. 3
Max Injection Rate (MMta)	1.67	1.67	1.67
Claimed as PBI [redacted]	[redacted]	[redacted]	[redacted]
Injection Duration (years)	13	13	13
Roughness Factor	0.0021	0.0021	0.0021
Compressor Outlet Temperature (°F)	80	80	80

The injection wells are divided into multiple completion intervals to optimize the usage of available pore space. Each completion stage represents a portion of the reservoir that will be injected into at a given time. Figure 3-12 shows the planned completion strategy for each injection well.

Figure 3-12: Summary of Injection Intervals and Durations for Each Injection Well



Claimed as PBI

A total of seven injection stages within the four formation intervals are planned for each well. Perforation depths and injection durations are summarized in Tables 3-6 through 3-8. The perforation depths are based on the current geologic model and will be adjusted based on injection well results.

Table 3-6: Summary of Completion Stages and Intervals for Rose CCS Project Injection Well No. 1

Stage	Interval	Estimated Completion Date (years post startup)	Top Depth TVDSS (ft)	Bottom Depth TVDSS (ft)	Gross Thickness (ft)	Net Reservoir (ft)	Duration (years)
1	Upper Frio Sand	0.00	7,382	8,025	643	353	2.00
2	Upper Frio Sand	2.00	7,163	7,348	185	185	2.00
3	Upper Frio Sand	4.00	6,938	7,122	185	164	2.00
4	Fleming Sand 3	6.00	5,561	5,922	361	120	2.00
5	Fleming Sand 3	8.00	5,131	5,492	361	223	2.00
6	Fleming Sand 2	10.00	4,187	4,766	579	186	2.00
7	Fleming Sand 1	12.00	3,472	3,932	460	293	1.00
TVDSS = true vertical depth subsea							

Table 3-7: Summary of Completion Stages and Intervals for Rose CCS Project Injection Well No. 2

Stage	Interval	Completion Date (years post startup)	Top Depth TVDSS (ft)	Bottom Depth TVDSS (ft)	Gross Thickness (ft)	Net Reservoir (ft)	Duration (years)
1	Upper Frio Sand	0.00	7,481	8,101	620	327	2.00
2	Upper Frio Sand	2.00	7,163	7,435	272	251	2.00
3	Upper Frio Sand	4.00	6,933	7,142	210	125	2.00
4	Fleming Sand 3	6.00	5,670	6,094	424	289	2.00
5	Fleming Sand 3	8.00	5,030	5,503	473	165	2.00
6	Fleming Sand 2	10.00	4,337	4,916	578	255	2.00
7	Fleming Sand 1	12.00	3,481	4,014	532	335	1.00
TVDSS = true vertical depth subsea							

Table 3-8: Summary of Completion Stages and Intervals for Rose Injection Well No. 3

Stage	Interval	Completion Date (years post startup)	Top Depth TVDSS (ft)	Bottom Depth TVDSS (ft)	Gross Thickness (ft)	Net Reservoir (ft)	Duration (years)
1	Upper Frio Sand	0.00	7,272	7,926	654	382	2.00
2	Upper Frio Sand	2.00	7,011	7,265	254	212	2.00
3	Upper Frio Sand	4.00	6,778	6,985	207	143	2.00
4	Fleming Sand 3	6.00	5,509	5,896	387	185	2.00
5	Fleming Sand 3	8.00	5,055	5,458	404	219	2.00
6	Fleming Sand 2	10.00	4,146	4,665	518	163	2.00

Stage	Interval	Completion Date (years post startup)	Top Depth TVDSS (ft)	Bottom Depth TVDSS (ft)	Gross Thickness (ft)	Net Reservoir (ft)	Duration (years)
7	Fleming Sand 1	12.00	3,382	3,893	511	229	1.00
TVDSS = true vertical depth subsea							

At each new completion, the modeled pressure constraint was updated in the model based on the upper perforation depth. Target injection rates were updated accordingly to meet the limitation that the BHP remained below the calculated fracture gradient. Tables 3-9 through 3-11 summarize injection rate and pressure parameters corresponding to all completions in each well.

Table 3-9: Modeled Injection Rates and Pressures for Rose CCS Project Injection Well No. 01

Stage	Year	Max. Rate (MMta)	Avg. Rate (MMta)	Max. BHP (psi)	Avg. BHP (psi)
1	0	1.67	1.67	3,720	3,600
2	2	1.67	1.67	3,543	3,462
3	4	1.67	1.67	3,544	3,465
4	6	1.43	1.43	2,825	2,667
5	8	1.43	1.43	2,627	2,563
6	10	1.26	1.26	2,140	2,100
7	12	1.1	1.1	1,777	1,731

Table 3-10: Modeled Injection Rates and Pressures for Rose CCS Project Injection Well No. 02

Stage	Year	Max. Rate (MMta)	Avg. Rate (MMta)	Max. BHP (psi)	Avg. BHP (psi)
1	0	1.67	1.67	3,828	3,666
2	2	1.67	1.67	3,588	3,460
3	4	1.67	1.67	3,482	3,439
4	6	0.94	0.94	2,705	2,648
5	8	0.94	0.94	2,623	2,553
6	10	1.26	1.26	2,152	2,111
7	12	1.32	1.32	1,868	1,791

Table 3-11: Modeled Injection Rates and Pressures for Rose CCS Project Injection Well No. 03

Stage	Year	Max. Rate (MMta)	Avg. Rate (MMta)	Max. BHP (psi)	Avg. BHP (psi)
1	0	1.67	1.67	3,796	3,602
2	2	1.67	1.67	3,518	3,419
3	4	1.67	1.67	3,473	3,408
4	6	0.94	0.94	2,617	2,581
5	8	0.94	0.94	2,568	2,518
6	10	0.73	0.73	2,165	2,102
7	12	0.88	0.88	1,811	1,725

Continuous injection rates, injection pressures, and associated pressure constraints for each well are illustrated on Figures 3-13 through 3-15.

Figure 3-13: Injection Rates and Pressures – Rose CCS Project Injection Well No. 01

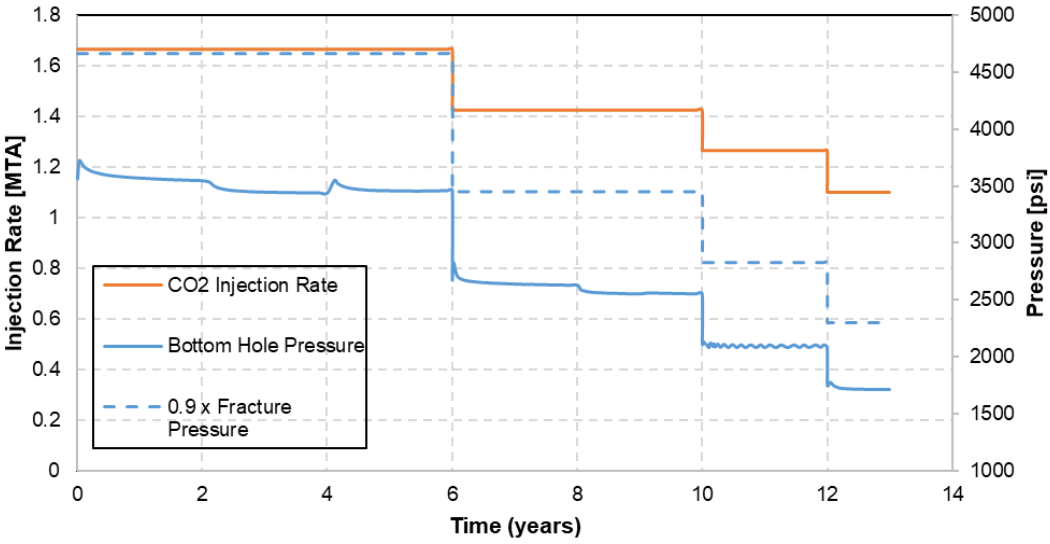


Figure 3-14: Injection Rates and Pressures – Rose CCS Project Injection Well No. 02

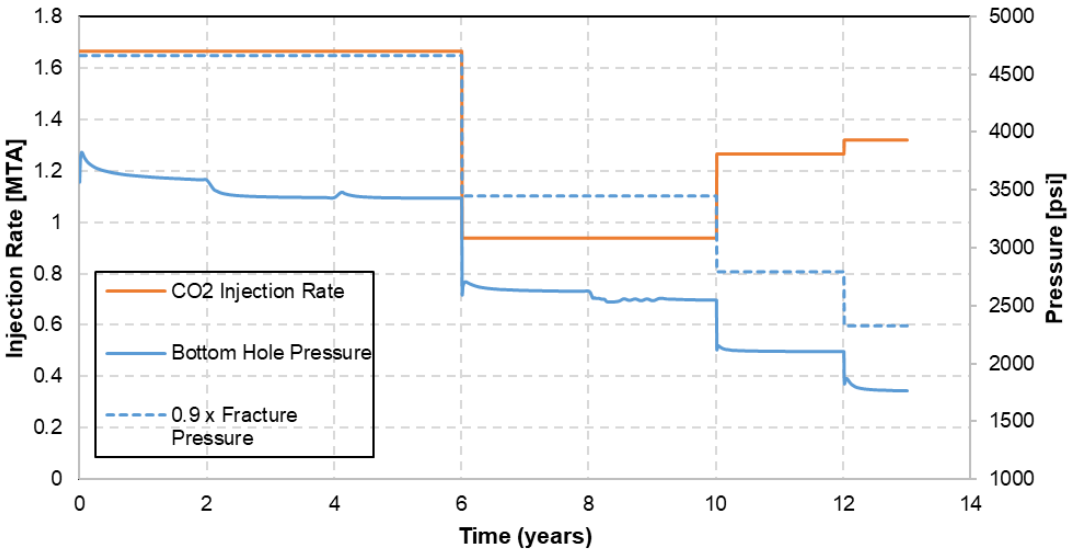
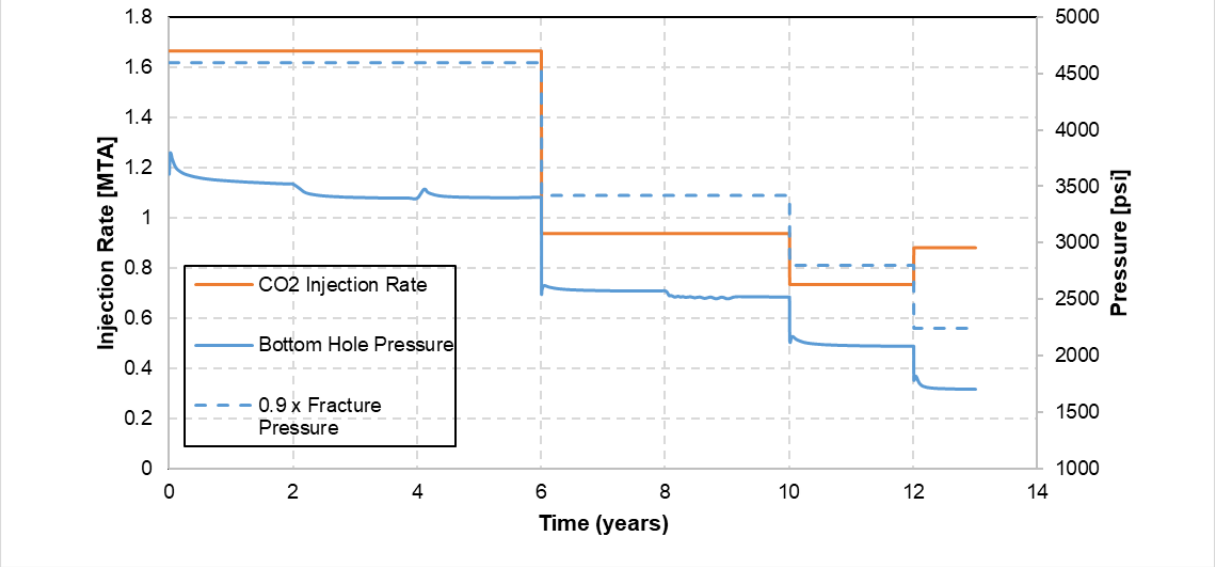


Figure 3-15: Injection Rates and Pressures – Rose CCS Project Injection Well No. 03



3.6.4 Fracture Pressure and Fracture Gradient

As discussed in Section 2.6 of Section 2 – Site Characterization, a log-based approach was utilized to evaluate undisturbed stress state at the field. The approach incorporated density and dipole sonic logs collected at Bead Farm Co. #1 well and was calibrated with formation integrity data from nearby offset wells. The fracture gradients shown in Table 3-12 have been calculated for the proposed injection zones based on site-specific data.

Table 3-12: Calculated Fracture Gradients for the Proposed Injection Zones

Claimed as PBI	[redacted]
[redacted]	

Using the estimated formation tops presented in Table 2-4 in Section 2 – Site Characterization, the estimated maximum bottomhole injection pressures for the top of the Fleming Sand 1 Injection Interval and the top of the Frio Sand 1 Injection Interval are shown in Table 3-13. The safety factor applied is 90% of estimated fracture pressure. Note that these values may be revised based on site data to be collected from injection wells and well completion strategy.

Table 3-13: Maximum Modeled Bottomhole Injection Pressures

Stage	Injection Interval	Parameter	Injection Well No. 01	Injection Well No. 02	Injection Well No. 03
1	Upper Frio Sand (1)	Top Depth (BGL)	7,440	7,520	7,331
		Claimed as PBI	[redacted]	[redacted]	[redacted]
		Maximum Allowed BHP (psi)	4,620	4,670	4,553
		Maximum Modeled BHP (psi)	3,720	3,828	3,796
2	Upper Frio Sand (2)	Top Depth (BGL)	7,186	7,186	7,034
		Claimed as PBI	[redacted]	[redacted]	[redacted]
		Maximum Allowed BHP (psi)	4,463	4,463	4,368
		Maximum Modeled BHP (psi)	3,543	3,588	3,518
3	Upper Frio Sand (3)	Top Depth (BGL)	6,961	6,956	6,801
		Claimed as PBI	[redacted]	[redacted]	[redacted]
		Maximum Allowed BHP (psi)	4,322	4,320	4,223
		Maximum Modeled BHP (psi)	3,544	3,482	3,473
4	Fleming Sand 3 (1)	Top Depth (BGL)	5,584	5,693	5,532
		Claimed as PBI	[redacted]	[redacted]	[redacted]
		Maximum Allowed BHP (psi)	3,417	3,484	3,386
		Maximum Modeled BHP (psi)	2,825	2,705	2,617
5	Fleming Sand 3 (2)	Top Depth (BGL)	5,154	5,053	5,078
		Claimed as PBI	[redacted]	[redacted]	[redacted]
		Maximum Allowed BHP (psi)	3,154	3,092	3,108
		Maximum Modeled BHP (psi)	2,627	2,623	2,568
6	Fleming Sand 2	Top Depth (BGL)	4,210	4,360	4,169
		Claimed as PBI	[redacted]	[redacted]	[redacted]
		Maximum Allowed BHP (psi)	2,577	2,668	2,551

Stage	Injection Interval	Parameter	Injection Well No. 01	Injection Well No. 02	Injection Well No. 03
		Maximum Modeled BHP (psi)	2,140	2,152	2,165
7	Fleming Sand 1	Top Depth (BGL)	3,495	3,504	3,405
		Claimed as PBI	[redacted]	[redacted]	[redacted]
		Maximum Allowed BHP (psi)	2,107	2,113	2,053
		Maximum Modeled BHP (psi)	1,777	1,868	1,811

3.6.5 Boundary Conditions

ExxonMobil selected the boundary condition for the model domain that describes the fluid flow rates and/or pressures at the edges of the model domain and at the location of injection wells. The Fleming and Frio injection intervals are characterized as highly connected throughout the region. Thus, an infinite-acting reservoir boundary condition was selected for the four edges of the rectangular model domain to simulate the pressure response from CO2 injection. In the model, “volume modifiers” were used along the edges of the model domain to change the gross volume of a grid cell by adding a “multiplier” to the original volume. Claimed as PBI [redacted]

The “volume modifiers” provide additional pore space for pressure dissipation at the boundary, which reduces the pressure build-up at the edge of the model domain. This effectively simulates the Fleming and Frio injection interval characteristics as being highly connected throughout the region. Care was taken to extend the model boundaries sufficiently far from the injection wells so that the estimates of CO2 plume and pressure front migration were not influenced by the boundary. Additionally, the upper and lower confining zones were assigned as impermeable layers, based on the site characterization. Any nearby faults were assumed to be transmissive only where sand-to-sand contact was predicted in the Petrel™ output. The approach reduced the potential for the model to predict no CO2 migration, when a potential for migration was apparent at a fault location.

3.7 AoR Delineation Based on Model Results

3.7.1 Extent of CO2 Plume

The areal grid block size in the model was selected to optimize model runtimes, limit grid distortion effects, and allow for sufficiently accurate contouring of plume extent over a distance of multiple miles. The operational and geologic input parameters were used in the Eclipse™ model to generate projections of plume and pressure migration versus time. Each well was initially completed and then recompleted into incrementally shallower portions of the injection intervals per the schedule presented on Figure 3-12.

Claimed as PBI [redacted]

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Figure 3-17: Modeled Areal Plume Size, Growth Rate, and Stabilization



3.7.2 Delineation of the Critical-Pressure Front

In accordance with 40 CFR 146.84, the AoR was delineated by the critical-pressure front created by the injection of CO2 into the injection intervals. Critical pressure is the increase in reservoir pressure that has a potential to create crossflow of brine from the injection zone into the lowermost USDW, assuming the presence of a hypothetical bridging conduit such as an unplugged borehole. The first step to predict the pressure front of interest is to calculate the critical pressure for each completion stage. Once critical pressure is estimated, a numerical simulation is used to predict the size and shape of the critical-pressure front defined by this pressure contour.

3.7.2.1 Critical-Pressure Calculations

The methodology for defining the critical pressure was sourced from Nicot (Nicot, 2009), which is referenced in the EPA guidance for calculations based on displacing fluid initially present in a borehole. Nicot assumed that the injection reservoir is in hydrostatic equilibrium, neither under- nor over-pressured, and that a direct path between the injection zone and lowermost USDW exists. An example hypothetical vertical pathway includes an insufficiently plugged and abandoned wellbore.

Claimed as PBI



he critical pressure was calculated for each completion phase of each injection well, with the top of the effective injection

interval perforations ranging from depths of 3,382 ft to 7,497 ft TVDSS. Based on the site-specific fluid samples from the stratigraphic well, the total dissolved solids (TDS) of the brine was observed to range from Claimed as PBI
Applying the minimum measured salinity Claimed as PBI results in a Claimed as PBI psi/ft reservoir pressure gradient if the reservoir was originally in hydrostatic equilibrium with a column of this brine from the depth of the reservoir to surface. The fluid within the USDW was assumed to be fresh water with a fluid pressure gradient of Claimed as PBI. Inputs for an example critical pressure calculation (Rose CCS Project Injection Well No. 01; Fleming Sand 1) are provided in Table 3-14.

Table 3-14: Input Parameter Values for Critical-Pressure Calculation at Rose CCS Project Injection Well No. 01, Fleming Sand 1

Input Parameter	Symbol	Value
Claimed as PBI		

The coefficient (λ) is first calculated in Equation 5 using the final, post-equilibrium pressure gradients and depths for the base of the USDW and top of injection zone:

(Eq. 5) $$\lambda = \frac{G_{if} - G_{uf}}{D_i - D_u}$$

Claimed as PBI

The coefficient (ξ) is then calculated in Equation 6 using the initial gradients and depths for the base of the USDW and top of injection zone:

(Eq. 6) $$\xi = \frac{G_{ii} - G_{ui}}{D_i - D_u}$$

Claimed as PBI

Finally, critical-pressure rise (ΔP_c) is calculated using Equation 7. The inputs include the coefficients (λ, ξ) calculated in Equations 5 and 6 and the depths for the base of USDW (D_u) and top of injection interval (D_i):

(Eq. 7) $$\Delta P_c = (D_i - D_u)\left[\frac{\lambda - \xi}{2}(D_i - D_u) + G_{uf} - G_{ui}\right]$$

Claimed as PBI

Claimed as PBI

The resulting critical-pressure rise for the uppermost stage of Rose CCS Project Injection Well No. 01 is positive, indicating that the reservoir pressure may be safely increased by approximately 41.2 psi, without risk of endangerment to the lowermost USDW. The calculated critical-pressure rise for each completion stage of each injection well is included in Table 3-15.

Table 3-15: Calculated Critical-Pressure Rise for Rose CCS Project Injection Intervals

Injection Stage	Interval	Salinity	Critical-Pressure Rise (psi)		
			Injection Well No. 01	Injection Well No. 02	Injection Well No. 03
1	Upper Frio Sand	Claimed as PBI	161.48	163.61	158.58
2	Upper Frio Sand		154.71	154.71	150.67
3	Upper Frio Sand		148.72	148.59	144.46
4	Fleming Sand 3		119.83	122.94	118.35
5	Fleming Sand 3		107.55	104.66	105.38
6	Fleming Sand 2		69.17	72.86	68.15
7	Fleming Sand 1		41.2	41.38	39.42

3.7.2.2 AoR Delineation

The maximum areal extents of both the CO2 plume and the critical-pressure front were used to delineate the AoR at any time interval or depth. The larger extent of either CO2 saturation or critical-pressure rise was used to define the AoR boundary. Figure 3-16 presents the maximum extent of the stabilized CO2 plume, approximately 26 years into the post-injection site care phase of the Project Claimed as PBI The critical-pressure front, illustrated in Figure 3-18, represents the maximum areal cone of influence and combines results from the seven completion intervals for each of the three injection wells. Figures 3-18 (a)-(d) represent critical pressure fronts assessed at years 1, 5, 10, and 13, respectively. Superimposing the maximum CO2 plume and critical-pressure boundaries, Figure 3-19 provides the AoR boundary for the Project.

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China, TX

USDW Monitoring Well No.01

In-Zone Monitoring Well No. 01

675893

689936

674757

Rose CCS Project Injection Well No. 03

Above-Zone Monitoring Well No. 1 Bead Farm Co. #1

645970

689934

670175

Rose CCS Project Injection Well No. 01

4224502193

678489

689937

6162901

USDW Monitoring Well No.02

4224502194

670177

689935

Rose CCS Project Injection Well No. 02

USDW Monitoring Well No.03

THERIOT RD

WALDEN RD

S PINE ISLAND RD

PINE ISLAND LILEE RD

PINE ISLAND RD

NOLIA LN

BOYT RD

LAWHON RD

Bayou Din

Gallier Canal

0 1,000 2,000 4,000 Feet

Source: Esri - World Topographic Map; NAD 1983 StatePlane Texas South FIPS 4205 Feet



Legend

- USDW Monitoring Well
- In-Zone Monitoring Well
- Above-Zone Monitoring Well No. 1 Bead Farm Co. #1
- Artificial Penetrations
- Injection Well
- TWDB Wells in AoR
- Maximum Pressure Front
- CO2 Stabilized Plume
- Area of Review
- Modeled Fault

Figure 3-19
Delineated Area of Review
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon
Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

DRAWN BY: GIS

SCALE: 1:29,500 when printed at 11x17

REVISED: 03/21/2025

FILE: M:\Projects\D-F\ExxonMobil\0672315 ExxonMobil CCS ETX\APRX\Rose\Site_Char_Figures\Site_Char_Figures_March2025.aprx

3.8 Stages of Model Development

The stages of development for the CO2 plume and pressure-front model started with pre-operational phase data and industry standards to predict the AoR boundary. The geomodel and reservoir model rely on these data and on industry standard correlations for the assignments of properties based on site-specific conditions. Physical rock property distributions assigned to the model based on geostatistics have been analyzed and are consistent with results from the stratigraphic and development wells and all other available data.

The following objectives were achieved for the pre-operational phase of the model:

1. Verify that the AoR was based on relevant existing and new information and identify where this information supports assumptions used in the model;
2. Align the conceptual/geologic model and model inputs with existing data, including pre-operational testing results at the stratigraphic and development wells;
3. Assess how the AoR model reasonably and accurately represents the geologic and operational systems, including sensitivity analyses, and yields information necessary to delineate the AoR; and
4. Confirm that conservative and reasonable methods were used to delineate the AoR and protection of USDW.

Looking forward to the operational phase of the project, updates will be made to the model for calibration purposes. The model calibration procedures will likely focus on the parameters that have been identified during the pre-operational modeling effort as the most sensitive parameters during sensitivity analyses. The calibration process is intended to be an iterative process, with updates to the geomodel and input parameters, to achieve an acceptable agreement between model predictions and the collected testing and monitoring data.

3.9 Corrective Action Plan and Schedule

Consistent with 40 CFR 146.84, the primary objective of this Corrective Action Plan is to identify the potential risk for loss of CO2 or brine containment through artificial penetrations of the UCCZ and to specify corrective actions that would be taken to restore the integrity of the UCCZ, if needed. ExxonMobil undertook a thorough investigation of artificial penetrations within and immediately adjacent to the AoR. Public and private databases were searched, historical aerial photographs were reviewed, an aeromagnetic survey was conducted across the AoR, and field reconnaissance with ground penetrating radar was conducted at certain locations to reduce uncertainty. When the results of these multiple lines of evidence were compiled, a total of five stratigraphic, legacy oil and gas (legacy wells), and water wells were identified within the AoR as shown on Figure 3-19.

Two artificial penetrations were found to penetrate the UCCZ based on an analysis of the available data. These two artificial penetrations warrant corrective action planning and scheduling based on conservative assumptions regarding the potential for impact by injection and assumptions with respect to well and plug characteristics. Following the requirements outlined in 40 CFR 146.84(c)(2), 146.84(c)(3), and 146.84(d), each artificial penetration within the AoR that may penetrate the UCCZ was evaluated for the quality of casing and cementing in the case of existing wells or for the quality of plugging and abandonment (P&A) in the case of abandoned wells. The planned corrective actions and schedule outlined in this section are

presented for each artificial penetration that could hypothetically serve as a conduit for fluid movement.

This section provides a rigorous corrective action process for each well that begins with additional well assessment activity and ends with establishing incremental barriers to remedy the potential for CO2 or brine crossflow between the injection zones and USDW. The USDW depth range is 1,415 to 1,489 ft KB. For conservative purposes, the USDW depth of 1,489 ft KB was used for setting the USDW cement plugs.

3.9.1 Data Acquisition and Evaluation of Artificial Penetration Information

In accordance with 40 CFR 146.82(a)(4) and 40 CFR 146.84(c)(2), a search was conducted to identify and assess the occurrence of artificial penetrations within and immediately beyond the AoR. Artificial penetrations included oil and gas wells; Class I, II, III, IV, and V UIC wells; water wells; mines; quarries; and potential subsurface cleanup sites. The following data sources were reviewed to identify potential artificial penetrations within the AoR:

- The Railroad Commission of Texas (RRC) GIS Database;
- The Texas Water Development Board;
- Texas Commission on Environmental Quality UIC Central File Room database;
- Brackish Resources Aquifer Characterization System;
- Database for underground mines and quarries (U.S. Geological Survey Mine Related Features and U.S. Geological Survey Mineral Resources);
- State- or EPA-approved subsurface cleanup sites; and
- Third-party Oil and Gas Record Databases including Enverus Drilling Info, IHS Energy Portal, Tobin Data, EMSDB, and HART.

No subsurface cleanup sites, mines, or quarries were identified within the AoR. Based on the well locations identified in the above databases, additional review was conducted utilizing historical records to assess their veracity of each implied well presence, geospatial location, and historical completion, along with plugging, casing, and cementing procedures for each artificial penetration. Duplicative well identifications were merged if appropriate based on the records. The following are additional analyses that were conducted for artificial penetrations:

- Historical aerial photograph reviews for the identified artificial penetration locations;
- A physical record request was made to the RRC, and the available documents were reviewed;
- An aeromagnetic survey of the AoR was completed in August 2023; and
- In-person reconnaissance surveys and use of ground penetrating radar were conducted on November 8, 2023, at selected locations with remaining uncertainty.

Using a combination of the data above, a tabulation of identified artificial penetrations within the AoR has been created and is summarized in Table 3-16. The identified artificial penetrations can be found on Figure 3-19. Available records for the identified artificial penetrations can be found in Appendix C.

Table 3-16: Summary of Artificial Penetrations within AoR

#	Well Name	State/ Federal Well ID (API Number)[1]	Well Type	Well Status	Date Drilled	Depth (ft KB)	Latitude, Longitude (NAD83)	Penetrates UCCZ?
1	Above-Zone Monitoring Well No. 01 Bead Farm Co. #1	4224532908	Project Monitoring Well	Active	10/15/2023 Recompleted 02/07/2025	8,664	29.999222, -94.297364	Yes
2	Broussard JE Jr-1[2]	4224502193	Dry Hole	P&A	2/10/1958	9,050	29.996539, -94.287435	Yes
3	Broussard J. E. Etal-1	4224502194	Dry Hole	P&A	Unknown	2,518**	29.999730, -94.274070	No
4	BFC-1 Rig Supply Water Well #1	645970	Water Rig Supply	In Use	8/11/2023	290*	29.999028, -94.298056	No
5	D. S. Wier	Not Available	Water Supply	P&A	1941	7*	30.001389, -94.270833	No
6	Labelle Properties Ltd #1	4224532913	Project Injection Well No. 01	Active	06/23/204	8,672	29.999678, -94.285108	Yes
7	Bead Farm Co. #2	4224532911	Project Injection Well No. 2	Active	07/15/2024	8,752	29.991017, -94.298036	Yes
8	Bead Farm #3	4224532912	Project Injection Well No. 3	Active	08/05/2024	8,565	30.011778, -94.297858	Yes
9	Bead Farm Company #4	4224532914	Project Monitoring Well	Active	08/31/2024	8,383	30.021558, -94.293978	Yes
10	Rose Rig Supply Water Well #1	670175	Water Rig Supply	Active	6/14/2024	300*	29.999857, -94.28321	No
11	Rose Rig Supply Water Well #2	670177	Water Rig Supply	Active	7/2/2024	300*	29.990716, -94.298632	No
12	Rose Rig Supply Water Well #3	674757	Water Rig Supply	Active	7/19/2024	300*	30.012428, -94.297908	No

[1] Readily available well identification numbers provided from public data sources up to March 19, 2025.

[2] API:42245E070100 and an associated dry hole (API: 245) were determined to be associated with Broussard JE Jr-1 and not separate wellbores.

13	Rose Rig Supply Water Well #4	675893	Water Rig Supply	Active	8/15/2024	300*	30.021947, -94.294199	No
14	USDW Monitoring Well No. 1	678487	USDW Monitoring Well	Active	8/20/2024	330*	30.030833, -94.310556	No
15	USDW Monitoring Well No. 2	678489	USDW Monitoring Well	P&A***	8/20/2024	440*	30.0025, -94.274444	No
16	USDW Monitoring Well No. 3	678491	USDW Monitoring Well	Active	8/20/2024	330*	29.9875, -94.298889	No
17	USDW Monitoring Well No. 2R	683826	USDW Monitoring Well	Active	11/9/2024	320*	30.0025, -94.274444	No
18	Shallow Groundwater Well #1	689934	Monitoring Well	Active	9/19/2024	25*	29.99927, -9428565	No
19	Shallow Groundwater Well #2	689935	Monitoring Well	Active	9/17/2024	25*	29.99062, -94.2986	No
20	Shallow Groundwater Well #3	689936	Monitoring Well	Active	9/17/2024	25*	30.01238, -94.29797	No
21	Shallow Groundwater Well #4	689937	Monitoring Well	Active	9/18/2024	20*	30.00268, -94.27403	No

Notes:

ID = identification
*Water well datum is BGL
**KB not available in historical records

***Casing collapsed above water table, couldn't collect sample, redrilled as 2R in same location

3.9.1.1 Review of Historical Aerial Photographs

ExxonMobil conducted a review of readily available historical aerial photographs for selected legacy wells to assess well location and completion dates. Two legacy wells within the AoR and one legacy well outside of the AoR were assessed using available historical aerial photographs from 1952 and 2020.

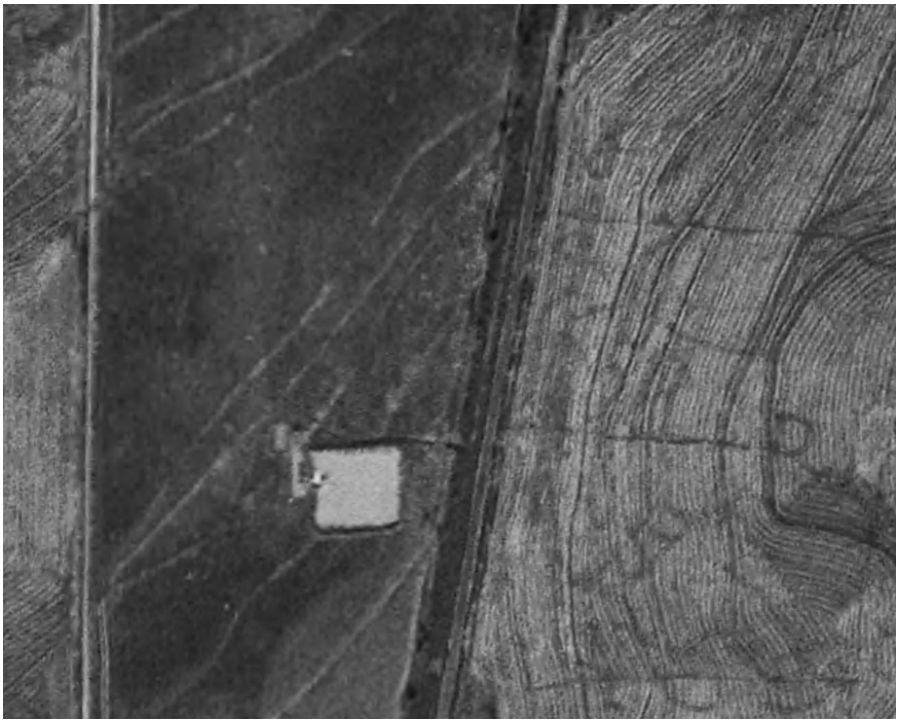
The Broussard Trust-1 (API: 4224500111) well location is located outside of the AoR and was completed below the UCCZ. Information on this well is provided for completeness purposes only to illustrate the standard of care taken to identify legacy wellbores for corrective action purposes. Based on the available imagery, a well pad and pit were observed in the 1952 historical aerial photograph (Figure 3-20), confirming the presence and location of this well. By the time that a 1976 aerial photograph was taken, the well pad appears to be revegetated and the pit remained visible showing that the well had been drilled but was probably not abandoned by that time. The pit was observed until at least the 1995 aerial photograph.

Figure 3-20: 1952 Historical Aerial Photograph of Broussard Trust-1 (API: 4224500111)



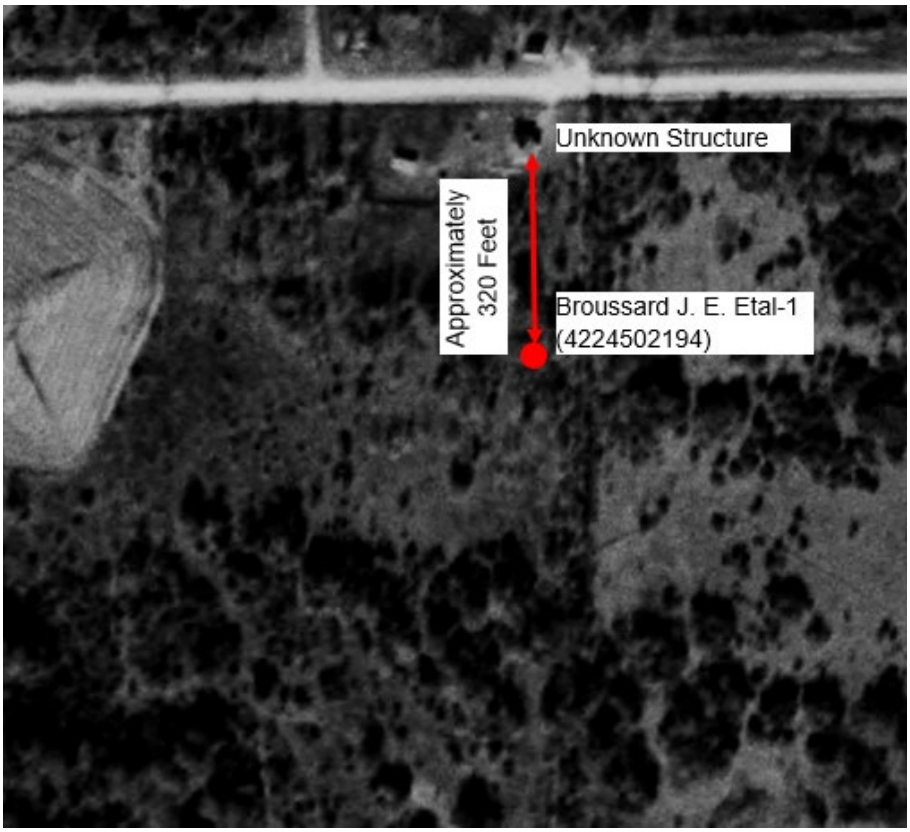
The Broussard JE Jr-1 (API: 4224502193) well location was identified in the 1959 historical photograph (Figure 3-21). In the 1960 aerial photograph, the pad appears to have been reclaimed with revegetation in progress.

Figure 3-21: 1959 Historical Aerial Photograph of Broussard JE Jr-1 (API: 4224502193)



The Broussard J. E. Etal-1 (API: 4224502194) location identified no well surface impacts and construction features within the historical aerial imagery. An unknown structure was identified to the north of the known coordinates along Lawhon Road in the 1952 historical photograph (Figure 3-22). In the 1957 aerial photograph, the structures appear to have been removed with revegetation of the area in progress. The relationship between the structure and the well location is uncertain. The well location was not confirmed as being a drilled well location.

Figure 3-22: 1952 Historical Aerial Photograph of Broussard J. E. Etal-1 (API: 4224502194)



3.9.1.2 Physical Records Review

For wells within the AoR, ExxonMobil obtained copies of physical records for Broussard JE Jr-1 (API: 4224502193). The remaining records were reviewed through digital copies on the RRC online databases, Enverus Drilling Info, and IHS Energy Portal. These records can be found in Appendix C-5.

3.9.1.3 Aeromagnetic Survey

Due to the age of well development in the area, additional data collection was conducted in selected portions of the AoR, wherein additional insight into well locations or details was required to improve accuracy. Magnetic survey methods were used in 2023 to scan portions of the AoR for magnetic anomalies that are caused by subsurface features, which could include abandoned wellbores with iron or steel casing. The survey was completed on a prior model of the AoR, which has since been updated. The survey was conducted by Sander Geophysics Ltd. A drone was flown across targeted portions of the AoR to identify the presence or absence of magnetic anomalies. Figure 3-23 shows the survey grid and the magnetic anomalies from the survey. The technical report from this survey can be found in Appendix C-4. As shown on Figure 3-24, well heads, pipelines, and farm equipment present during the survey are displayed according to the key. Well heads are generally high amplitude positive (red) anomalies with wavelengths ranging from 150 meters to 500 meters (in this region). Pipelines are a series of positive/negative anomalies (red and blue) based on flight line spacing for the survey. Negative anomalies are generally due to the base of a magnetic source indicating near surface nature with limited depth extent. Most of the lower amplitude and shorter wavelength positive anomalies were noted to be due to surface culture (e.g., culverts and bridges).

Figure 3-23 shows the aeromagnetic survey results superimposed with the artificial wells identified. Based on this review, no additional legacy well locations were identified.

Figure 3-23: Aeromagnetic Survey Grid and Magnetic Anomalies within AoR



Figure 3-24: Aeromagnetic Survey Analysis of Anomalies



ExxonMobil attempted to conduct an in-person reconnaissance survey for two legacy well locations identified in Table 3-16 for Broussard JE Jr-1 (API: 4224502193) and Broussard J. E. Etal-1 (API: 4224502194), and one well that was outside the AoR for Broussard Trust-1 (API: 4224500111). The intent of the survey was to address uncertainty regarding the existence of these reported legacy wells and verify their presence or absence. ExxonMobil worked with a geophysical surveyor, Ground Penetrating Radar Services, Inc. (GPRS), to conduct survey assessments. GPRS utilized a frequency domain electromagnetic induction meter for the geophysical surveys. Two of the three locations, Broussard JE Jr-1 (API: 4224502193) and Broussard J. E. Etal-1 (API: 4224502194), were flooded due to farm irrigation activities. The presence of standing water negates the electromagnetic induction signal; therefore, they could not be surveyed. A visual inspection of the location was recorded including looking for apparent features that may have indicated the presence of a legacy well pad or mud pit. None were apparent at the three flooded well locations.

The results of the in-person survey completed for the Broussard Trust-1 (API: 4224500111) well location are presented in Figure 3-25. The geophysical survey image indicates findings across four different frequencies. These are typical frequency formats utilized for detecting metallic objects. The orange feature on the figure running east to west indicates a very bright linear reaction that is produced by a pipeline running across the northern portion of the area. ExxonMobil confirmed the presence of multiple pipelines in this area via the RRC GIS Database. The pipelines were identified as active and operated by Energy Transfer Company and Mobil Pipe Line Company. These pipelines reportedly transfer crude oil and high volatile liquids. The yellow feature on Figure 3-25 shows a positive reaction in the southwest portion of the survey, which appears to be a linear feature (such as a flowline or pipeline) running generally from northwest to southeast. The blue area indicates a negative reaction near the center of the area, which indicates an area of less conductivity than the surrounding data. The blue negative reaction can indicate soil features such as compaction for dirt foundations or other soil disturbances such as the presence of a hole in the ground. The records for the Broussard Trust-1 (API: 4224500111) well indicated this location was a dry hole that was plugged and abandoned after it was drilled in 1937, so there would be no metal anomalies expected to exist within the wellbore if it was a dry hole where casing was not run or was pulled. It is likely that the historical location of the well is in the area identified by the negative reaction in blue in the center of the survey area.

Figure 3-25: GPRS Geophysical Survey Image of Broussard Trust-1 (API: 4224500111)



3.9.1.4 Review of Abandoned Well Plugging Records

ExxonMobil conducted an evaluation of the information available for the artificial penetrations listed in Table 3-16. The list of topics reviewed included:

- Well depth and completion;
- Well drilling date;
- Well abandonment date;
- Open hole or cased hole identification;
- Location of reported plugs;
- Casing and cementing records;
- Records of mechanical integrity tests or logs performed; and
- Well deviations.

The wells listed on lines 3 through 5 and 10 through 22 in Table 3-16 were found to have completion depths shallower than the UCCZ; therefore, no further assessment for corrective action was warranted because the wells have not penetrated the UCCZ. Wells 1 and 2 were identified as penetrating the UCCZ and subject to an assessment of plugging records and potentially corrective action for deficiencies. Record availability for the two artificial penetrations requiring corrective actions were sufficient for determining the corrective action plans. As

expected, wells drilled in the 1940s and early 50s have limited well completion information; however, this did not impact the corrective action plan.

3.9.1.5 Summary of Artificial Penetrations Tabulation

ExxonMobil conducted a thorough assessment of the potential for artificial penetrations to be present within the AoR. Wells and boreholes completed above the UCCZ were determined to pose no hypothetical risk to function as a vertical conduit from the injection zone. For those artificial penetrations that were completed below the UCCZ, multiple sources of information were reviewed, and the relevant information was analyzed in detail [40 CFR 146.84(c)(2)]. Table 3-16 presents a summary of the artificial penetrations of interest for developing the Corrective Action Plan. The following summarizes the findings to date for the three legacy wells (excluding non-applicable water wells) identified in the AoR:

- Bead Farm Co. #1 (4224532908): This well is within the CO2 plume and within the pressure front. ExxonMobil drilled this well in October 2023 as a stratigraphic well for this Project. The stratigraphic well has since been converted to an above-zone monitoring well to conduct monitoring above the confining zone. The well is cased and cemented with top of cement above the UCCZ utilizing CO2-compatible cement. An additional balanced cement plug with CO2-compatible cement was placed at the UCCZ inside the casing.
- Broussard JE Jr-1 (4224502193): This well is within the CO2 plume and within the pressure front. The well was drilled in the 1950s and completed as an open hole. A CO2-compatible cement plug has been set at the UCCZ. An additional CO2-compatible cement plug has been set at the USDW, the Base of Usable Quality Water (BUQW), the shoe casing, and the Superior Quality Water (SQW).
- Broussard J.E. Etal – 1 (4224502194): The well is within the CO2 plume and within the pressure front. The well is an open hole well drilled to a reported 2,518 ft KB. The well does not penetrate the UCCZ and is not considered a risk for potential brine crossflow.

3.9.2 Corrective Action Plan for Artificial Penetrations

ExxonMobil developed a Corrective Action Plan for each artificial penetration that was identified to have the potential to act as a vertical conduit because it was not plugged, it was plugged and abandoned improperly, or not plugged in a manner that mitigates the movement of CO2 or other fluids that could potentially endanger USDWs as required by 40 CFR 146.84(c) and (d).

For the well identified with plugging deficiencies, the basis for the corrective action strategy is to re-enter each well that has insufficient proof that it has been sealed to reduce the potential for vertical flow through the UCCZ and to install cement barriers inside the casing to mitigate migration potential through the casing. The CO2-compatible cement material has been used where appropriate in accordance with 40 CFR 146.84(d).

3.9.2.1 Tabulation of Artificial Penetrations for Corrective Action

Figure 3-26 shows the location of the wells identified for corrective action in relation to the five-year pressure front and CO2 plume. Table 3-17 lists Bead Farm Co. #1 (API: 4224532908) and Broussard JE Jr-1 (API: 4224502193) as identified for corrective actions prior to injection based on the expected arrival times of the CO2 plume and pressure front.

As described in the Testing and Monitoring Plan of this Application, direct and indirect monitoring technologies will be used to track the CO2 plume and pressure front. A planned

reevaluation of the AoR will occur after five years of injection and throughout the lifecycle of the Project. If at any time the rate of the CO2 plume or pressure front expansion is predicted to impact additional artificial penetrations that may be found, the Corrective Action Plan will be amended to include the necessary corrective action to reduce the potential for USDW endangerment in accordance with 40 CFR 146.84(b)(2)(i)–(iv).

3.9.2.2 Analysis of Wells Identified for Corrective Action

Table 3-18 summarizes the available information concerning the borehole or well completion features and the P&A activities, as appropriate. ExxonMobil reviewed this information and determined the specific defects that require mitigation under 40 CFR 146.84(c) and (d).

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Table 3-17: List of Artificial Penetrations and Schedule for Corrective Action

Well Name	API Number	Latitude, Longitude (NAD83)	Pressure Plume	CO2 Plume	Casing	Schedule
Bead Farm Co. #1	4224532908	29.9992220, -94.2973637	Year 1 (Upper Frio)	Year 6 (Fleming 3)	Casing Present	Pre-operation
Broussard JE Jr-1	4224502193	29.996050, -94.286120	Year 13 (Upper Frio)	Year 1 (Upper Frio)	Open Hole	Pre-operation

Table 3-18: Summary of P&A Deficiency for Wells Penetrating UCCZ

Well Name	API Number	Apparent Deficiency or Uncertainty Based on Review of Available Information			Summary of Corrective Action
		Casing Records at UCCZ	USDW plug(s) installed	UCCZ + plug(s) installed	
Bead Farm Co. #1	4224532908	Cased	No	Yes	Pump inside casing with CO2-compatible cement plug(s) across the UCCZ, convert wellbore to Above-Zone Monitor Well
Broussard JE Jr-1	4224502193	Open borehole	Yes	Yes	Pumped open hole CO2-compatible cement plug(s) at UCCZ, USDW, BUQW, casing shoe, and SQW.

3.9.3 Corrective Action Sequence Plan

The following corrective action sequences were undertaken in accordance with 40 CFR 146.84(c)(3) for the two artificial penetrations listed in Table 3-17. The outlined actions are based on completed plugging activities for the stratigraphic well or to plug deficiencies potentially present in the legacy well based on the available records (Table 3-18). Each artificial penetration in the CO2 plume has been re-entered, and if sufficient barriers are not present, each well has had the appropriate barriers installed during the corrective action P&A field operations. The barriers have been established at the UCCZ, the surface casing shoe, the base of the lowermost USDW, and wellhead surface. The barrier at the UCCZ was constructed of CO2-compatible material consistent with 40 CFR 146.84(d).

A general approach for well re-entry and corrective actions is summarized in the sections below. A detailed summary of the corrective action sequence for each well and dates when actions were taken are presented in Table 3-19 and as specific well schematics for each well to be re-entered in Appendix C.

3.9.3.1 Field Verification of Well Status

For each well that was field verified via re-entry, the casing and cement plug features and potential for sufficient isolation were evaluated using standard industry tools. ExxonMobil completed a visual inspection of cement evidence at surface before well re-heading, conducted a casing pressure test, and if needed, completed a cement sheath evaluation log. In accordance with 40 CFR 146.84(d), the actual deficiencies of the casing or cement identified during tests would be the basis for the corrective action sequences pursued during field operations to seal at each artificial penetration.

3.9.3.2 Preparing the Surface Location

Prior to mobilizing at a well location, ExxonMobil conducted an initial site visit to identify current site access and wellhead conditions. If required, a subsurface survey was completed utilizing ground penetrating radar to identify the well location. If legacy equipment remained on the site, the equipment was removed prior to mobilization. Surface piping and electrical components were assessed and removed from the site locations. Additionally, access roads to the area surrounding the pad and wellhead access improvements were evaluated to facilitate safe entrance and egress along with rig operations.

If a sign or marker was present, the first step was to confirm that the API number on the plat corresponded to the well where mobilization was taking place to complete corrective action operations. After the P&A marker or exposed metal plate was removed, necessary equipment would be rigged up on the well. The cement surface plug of the well would be drilled out and the hole conditioned sufficiently for well logging tools to be utilized within the well on an as-needed basis.

ExxonMobil followed required notification requirements prior to commencing remedial field activities that may take the form of workover or drilling operations. At least five days prior to commencement of well plugging operations, ExxonMobil notified the RRC via a request for approval of the proposed procedure for plugging the well using Form W-3A. ExxonMobil also notified the RRC at least four hours prior to the start of plugging operations. Copies of the notifications and of field operational records provided to the state are provided to EPA Region 6.

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[redacted]

3.9.3.4 Reporting Completion of Corrective Action

After completing the corrective actions and re-plugging a well, a W-3 plugging report will be submitted to the RRC within 30 days of plugging, including the W-15 cementing report. Records of the corrective actions will be submitted to the UIC Program Director, with copies provided to EPA Region 6.

3.9.4 Site-Specific Review of Corrective Actions

Table 3-19 provides the corrective action sequences for the two wells. Appendices C-1 to C-2 provide the well schematics of each legacy well that have been re-entered for evaluation and re-plugging, which were developed based on the historical information and completion of the associated proposed corrective actions.

Table 3-19: Summary of Corrective Actions for Wells Penetrating the UCCZ

[redacted]

3.9.5 Stratigraphic Well P&A and Conversion

The following section outlines the plan for the P&A and conversion of the stratigraphic well referred to as Bead Farm Co. #1. The stratigraphic well was completed in the immediate vicinity of the injection wells for the purpose of gathering site-specific physical and chemical information on the confining and injection zones as well as to conduct conductivity testing. Once the data gathering activities were completed, the stratigraphic well was plugged across the UCCZ and converted to an above-zone monitoring well to obtain fluid samples from first permeable interval above the UCCZ.

3.9.5.1 Pre-Plugging Activities (Notifications, Permits, and Inspections)

ExxonMobil has complied with reporting and notification provisions for stratigraphic wells drilled in Texas in accordance with RRC. The following notifications and permits were submitted:

- Bead Farm Co. #1: Complete Cementing Report Form W-15 and Recomplete Report Form W-2 to be filed with the RRC District Office 3 within 150 days after recompletion.

Broussard JE Jr-1: Submit W3 plugging report with necessary attachments within 30 days after plugging operations are completed. ExxonMobil has also submitted these records to the UIC Program Director for completeness purposes.

Claimed as PBI [redacted]

3.9.6 Plan for Site Access

In accordance with 40 CFR 146.84(b)(2)(iv) and 40 CFR 146.84(d), ExxonMobil has negotiated land access for each of the artificial penetrations identified for corrective action. Research to identify the well owners via regulatory databases has been completed and necessary access rights secured. The limited number of legacy wells requiring corrective action prior to commencing operations is a significant factor in mitigating the risk for the Project.

As shown in Table 3-20, an access agreement is in place for the Bead Farm Co. #1 stratigraphic well and Broussard JE Jr-1. Corrective actions for these wells have been completed. If appropriate and necessary, ExxonMobil will seek plugging orders from the RRC in

accordance with Subchapter C of Chapter 89 of the Texas Natural Resource Code to obtain access for corrective actions.

If the AoR reevaluation conducted at the minimum schedule of once every five years identifies the potential for corrective action requirements at additional wells, ExxonMobil will promptly begin review of the additional wells in accordance with the process described this Corrective Action Plan. If future site access issues are identified for wells identified for corrective action, ExxonMobil will notify the UIC Program Director.

Table 3-20: Summary of Access Milestones for Corrective Action

Well Name	API Number	Proposed Actions for Access Rights	Anticipated Date of Final Access Agreement
Bead Farm Co. #1	4224532908	ExxonMobil is the operator of this well. Wellbore access is in place. Surface access agreements are in place with the surface owner this well is located on. These rights run with land ownership. If the land is conveyed to a third party, the surface access rights will remain in place.	Completed
Broussard JE Jr-1	4224502193	The last operator of this wellbore does not have an active Organization Report (P-5) status with the RRC. ExxonMobil conducted an open records request for the well and confirmed the owner of the well does not have an active P-5. ExxonMobil has acquired the required RRC permits for re-entering the well and completing corrective actions. ExxonMobil has confirmed site access with the landowner Labelle Properties, Ltd to complete the corrective actions.	Acquired on March 31, 2023

3.10 AoR Reevaluation Plan and Schedule

3.10.1 Frequency of AoR Reevaluation

ExxonMobil adopts the minimum frequency of five years for the AoR and Corrective Action Plan reevaluation. Information gathered from implementation of the Section 5 – Testing and Monitoring Plan will be used to evaluate whether a more frequent review period is warranted based on the observed conditions of CO2 plume and pressure front migration.

If an alteration of the AoR reevaluation frequency of a minimum of every five years is recommended, the change in frequency will be aligned with the data evaluation and findings relative to the degree of protectiveness of USDW and approved by the UIC Program Director. ExxonMobil acknowledges that any amendments to the AoR and Corrective Action Plan must be approved by the UIC Program Director, must be incorporated into the permit, and are subject to the permit modification requirements at 40 CFR 144.39 or 144.41, as appropriate. ExxonMobil also acknowledges the requirement in 40 CFR 146.84(b)(2)(i) of “The minimum fixed frequency, not to exceed five years, at which the owner or operator proposes to reevaluate the area of review.”

3.10.2 Content of the AoR Reevaluation

The requirements for AoR reevaluation are specified in 40 CFR 146.84(e) and include the following considerations:

- Reevaluate the AoR in the same manner specified in 40 CFR 146.84(c)(1);
- Identify all wells in the reevaluated AoR that require corrective action in the same manner specified in 40 CFR 146.84(c);
- Perform corrective action on wells requiring corrective action in the reevaluated AoR in the same manner specified in 40 CFR 146.84(d); and
- Submit an amended AoR and Corrective Action Plan or demonstrate to the UIC Program Director through monitoring data and modeling results that no amendment to the AoR and Corrective Action Plan is needed. Any amendments to the AoR and Corrective Action Plan must be approved by the UIC Program Director, must be incorporated into the permit, and are subject to the permit modification requirements at 40 CFR 144.39 or 144.41, as appropriate.

3.10.3 Conditions Warranting AoR Reevaluation

The monitoring and operational conditions that would warrant a reevaluation of the AoR prior to the next scheduled reevaluation [i.e., the minimum fixed frequency established in 40 CFR 146.84 (b)(2)(i)] are outlined below. These triggering events are based on a review of the hydrogeological site characteristics, the AoR and plume model results, and the pre-operational and operational plans for the Project. For each triggering event, Table 3-21 provides a summary of how the monitoring and operational data will be used to inform an AoR reevaluation and how corrective action will be conducted to reduce the potential for threats to USDW, if any arise. If an AoR reevaluation were to occur, corrective actions will be reevaluated.

Table 3-21 provides a list of the potential triggers for an AoR reevaluation consistent with the requirements of 40 CFR 146.84(b)(2)(ii).

Table 3-21: Triggers for AoR Reevaluation

No.	Events that may Trigger an Unscheduled AoR Reevaluation, with concurrence of the UIC Program Director	How Will Monitoring and Testing Data Inform the AoR Reevaluation?	How Corrective Action will be Conducted to Reduce the Potential for Threats to USDW
1	Compliance with minimum fixed frequency of at least once every five years [40 CFR 146.84(b)(2)(i)].	The AoR may need to be reevaluated more frequently than the minimum fixed frequency based on changes in operations or results from site monitoring that differ from model predictions. In these cases, the schedule for AoR reevaluation may be updated appropriately.	ExxonMobil will notify the UIC Permit Manager that a more frequent AoR reevaluation is warranted based on changed conditions. This notification will form the basis of a permit modification and updates to the relevant portions of the Application.
2	changes in operations that mandate AoR reevaluation under 40 CFR 146.84(c) as outlined below.	AoR reevaluation will be informed by both planned changes to operations and by testing and obtaining monitoring data that signal potential unexpected CO2 plume migration impacting the extent of the AoR. Examples may include installation of an additional injection well or identification of new offset well installation by third parties. Certain short-term operational changes, such as temporary well shut-ins, are not expected to warrant AoR reevaluation.	ExxonMobil will notify the UIC Program Director of the plan for changes in operations by pre-permitting engagement and the necessary modifications to the permit. The UIC Program Director may require an AoR reevaluation prior to approving such operational changes or changes may be allowed to occur prior to reevaluation of the AoR. The AoR reevaluation will be submitted to the UIC Program Director within an agreed-upon timeframe of instituting such changes, as described in the AoR and Corrective Action Plan.
2A	Plan to change injectate composition mixture.	Re-run the reservoir plume model with a new composition mixture. If plume extents increase, reevaluate the AoR.	Within one month of composition change, notify the UIC Program Director of change and potential need to reevaluate AoR.
2B	New offset operations are established.	Re-run the reservoir plume model with new data. If plume increases in shape or extents, reevaluate the AoR.	Within one month of commencement of new operations, notify the UIC Program Director of change and potential need to reevaluate AoR.
2C	Measured supercritical gas saturation is different than modeled gas saturation.	Re-run the reservoir plume model with new data. If plume increases in shape or extents, reevaluate the AoR.	ExxonMobil will notify the UIC Program Director of results from the AoR reevaluation based on model results.
2D	An injection well exhibits an anomalous change in surface	Incorporate new pressure information and re-run the reservoir plume model with new data. If plume increases in shape or extents, reevaluate the AoR.	ExxonMobil will notify the UIC Program Director of results from the AoR reevaluation based on model results.

No.	Events that may Trigger an Unscheduled AoR Reevaluation, with concurrence of the UIC Program Director	How Will Monitoring and Testing Data Inform the AoR Reevaluation?	How Corrective Action will be Conducted to Reduce the Potential for Threats to USDW
	pressure for a sustained period of time.		
2E	An injection well exhibits an anomalous change in bottomhole temperature for a sustained period of time.	Incorporate new temperature information and re-run the reservoir plume model with new data. If plume increases in shape or extents, reevaluate the AoR.	ExxonMobil will notify the UIC Program Director of results from the AoR reevaluation based on model results.
2F	Casing or tubing leak detected by casing integrity logging.	Investigate possible tubing leak and trigger contingency monitoring to reevaluate the AoR.	ExxonMobil will notify the UIC Program Director of results from the AoR reevaluation based on contingency monitoring results.
2G	Positive pressure loss in tubing annulus.	Investigate possible pressure loss and trigger contingency monitoring to reevaluate the AoR.	ExxonMobil will notify the UIC Program Director of results from the AoR reevaluation based on contingency monitoring results.
3	Results from site monitoring that differ from model predictions [40 CFR 146.84(b)(2)(ii)] as outlined below.	An evaluation of monitoring data [required under 40 CFR 146.90] indicates that CO2 and/or pressure front migration is different than that predicted by the current AoR delineation model and, therefore, warrants an AoR reevaluation. The following examples provide specific criteria for differences in monitoring data and model predictions that may trigger an AoR reevaluation [40 CFR 146.84(b)(2)(ii)].	Notification of difference to UIC Program Director within one month of confirmed findings.

No.	Events that may Trigger an Unscheduled AoR Reevaluation, with concurrence of the UIC Program Director	How Will Monitoring and Testing Data Inform the AoR Reevaluation?	How Corrective Action will be Conducted to Reduce the Potential for Threats to USDW
3A	Seismic event greater than M3.0 within 5.6-mile radius of injection well.	Evaluate pressure and temperature data relative to operating limits and pressures in the in-zone monitoring well. Evaluate the need to enhance monitoring program to confirm extent of CO2 plume.	If evidence of mechanical integrity issues may cause an endangerment to USDW cease injection, notify the UIC Program Director within 24 hours of the determination and implement the emergency and remedial response plan approved by the UIC Program Director. Operations will resume upon UIC Program Director concurrence that necessary remedial or corrective measures have been taken such that the risk to the USDW is as low as reasonably practicable.
3B	Annual plume migration survey identifies the plume migration direction that is different then the modeled direction of migration.	Re-run the reservoir plume model incorporating injection well pressure and temperature data for calibration and other available information on plume migration and reevaluate the AoR.	Within one month of detection, ExxonMobil will notify the UIC Program Director of results from the AoR reevaluation based on calibrated model results.
3C	The horizontal CO2 plume migration rate is different than predicted.	Re-run the reservoir plume model incorporating injectors data for calibration and new information on plume migration and reevaluate the AoR.	ExxonMobil will notify the UIC Program Director of results from the AoR reevaluation based on calibrated model results.
3D	Sustained acoustic anomaly, which is unrelated to oil and gas activity in the area, detected by seismic survey or noise log.	Investigate seismic survey data anomaly and decide if the change triggers contingency monitoring to reevaluate the AoR.	ExxonMobil will notify the UIC Program Director of results from the AoR reevaluation based on seismic survey data analysis and or results from contingency monitoring.
3E	Statistically significant increases of indicator parameter concentrations above baseline for USDW samples of TDS, major cations and anions, CO2 concentration, isotopic values, or pH.	Resample fluid sample that contained the elevated concentrations and compare resample results with numerical criteria for trends and/or exceedances of target concentrations.	ExxonMobil will notify the UIC Program Director of results from the AoR reevaluation based on resampling results and data evaluation.
3F	The presence of separate-phase CO2 in the sampled fluids above the confining zone,	Investigate possible migration pathways and trigger contingency monitoring to reevaluate the AoR.	ExxonMobil will notify the UIC Program Director of results from the AoR reevaluation based on contingency monitoring results.

No.	Events that may Trigger an Unscheduled AoR Reevaluation, with concurrence of the UIC Program Director	How Will Monitoring and Testing Data Inform the AoR Reevaluation?	How Corrective Action will be Conducted to Reduce the Potential for Threats to USDW
	but below the lowermost USDW resulting from CO2/fluid migration out of the injection zone.		

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Underground Injection Control – Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

SECTION 4 – WELL CONSTRUCTION PLAN AND OPERATING CONDITIONS

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage LLC

May 2025

SECTION 4 – Well Construction Plan and Operating Conditions

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4.0 Well Construction Plan and Operating Conditions

ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) is submitting this Underground Injection Control (UIC) Class VI permit application to the U.S. Environmental Protection Agency (EPA) for the Rose Carbon Capture and Storage (CCS) Project (Project). ExxonMobil is undertaking the Project in Jefferson County, Texas, to sequester a maximum of 5 million metric tonnes per annum (MMta) of carbon dioxide (CO2) using three injection wells over an injection period of up to 13 years. The predicted total CO2 storage is 53 million metric tonnes. The Well Construction Plan and Operating Conditions (Section 4) of the permit application contains information on the well construction and operating conditions in compliance with the requirements of the Code of Federal Regulations, Title 40, Sections 146.82 and 146.86 [40 CFR 146.82 and 146.86] and Texas Administrative Code, Part 1 Title 16 Chapter 5.

The three injection wells were designed for the sole purpose of injection and storage of CO2 safely in the Upper Frio and Fleming Sand injection intervals at the Project site, and to contain the CO2 within the injection intervals, protecting underground sources of drinking water (USDWs). The formation properties of the injection intervals make the Project site an excellent candidate for injection of CO2, with high porosity, high permeability, and brine fluids that contain approximately 5,000 feet (ft) of gross vertical sand thickness. Interbedded and overlying shale layers confine the injection intervals from USDW.

The well materials were compatible with all fluids with which they may come into contact and the design considered the depth of all porous formations, as identified during site characterization. The well design and materials were also appropriate for the proposed operating parameters. The formation testing at the injection well locations filled potential gaps in available site characterization data and addressed key uncertainties in the Area of Review (AoR) delineation modeling.

The injection well construction specifications and testing plan were tailored to account for the data acquired from the logging, testing, and preliminary results from a stratigraphic well (Bead Farm Co. #1) that was completed in close proximity to the three injection sites in 2023. The stratigraphic well (Bead Farm Co. #1) has since been converted to an above-zone monitoring well to conduct monitoring above the confining zone.

This section provides a narrative document with associated schematics and data summary tables that describe how ExxonMobil constructed the injection wells to meet the goals of 40 CFR 146.86. The engineering design is based on the collection of as much site-specific data as possible, particularly from the stratigraphic well, before submitting the Class VI Permit Application. This level of effort was undertaken to facilitate the permit modification process, between conducting the pre-construction activities required at 40 CFR 146.82(a) and the pre-operation phase activities required at 40 CFR 146.82(c).

4.1 Objectives

ExxonMobil developed the engineering design, pre-operational testing plan, and operating strategy for the injection wells to meet the following objectives:

- The injection well construction design, material specifications, and construction were compatible with the composition of the CO2 stream over the duration of the Project to reduce the potential for endangerment of USDWs [40 CFR 146.82(a)(11),(12); 146.86].

- The injection wells underwent logging and testing to assess injection well and formation performance and update the operating strategy as necessary before injection of CO2 [40 CFR 146.82(a)(8); 146.87].
- The injection well operating strategy provides continuous injection and annulus monitoring systems for each injection well to control injection pressure and trigger automatic shut-off devices and safety valves for CO2 injection, consistent with safe operating procedures [40 CFR 146.82(a)(7),(9),(10); 146.88(e)].

4.2 Engineering Design

The engineering design parameters for the three injection wells were based on the planned injection rates, injection volumes, fluid properties, and chemical properties of the injectate fluid. In addition, the engineering design included recompletion of each injection well to target-specific injection intervals to achieve the target CO2 storage amount.

ExxonMobil plans to inject a maximum volume of 5 MMta for all three injection wells, which is an approximate rate of 264 million standard cubic feet per day at standard conditions. The tubing design, including size, weight, grade, and metallurgy was based on the properties of the injectate, rate of injection, and injection pressures determined by the detailed reservoir modeling.

The casing, cement, tubing, packer, continuous monitoring devices, and wellhead equipment were selected and designed to withstand the corrosive environment to which the materials and equipment will be exposed. Each was selected to have sufficient strength and material properties to withstand the pressure, temperature, and corrosive forces to which they will be subjected in the subsurface.

The following discussion presents the engineering design basis for the well materials including casing, tubing, and cement. Well design schematics and locations are included in Appendix D.1, which illustrate the well materials, design layout, and the locations of the packer and perforation intervals as well as the well location at the Project site.

The injection wells have been permitted for drilling through the RRC. A summary of the permitted well names and American Petroleum Institute (API) numbers is as follows:

Injection Well Information:

Well Name and Number	Labelle Properties Ltd #1 **(Rose CCS Project Injection Well No. 01)**
County	Jefferson
Location (RR D, S, A)	Railroad District 3, Section 42, Abstract 874
Latitude / Longitude (NAD83)	29.999678 / -94.285108
API	4224532913

Well Name and Number	Bead Farm Co. #2 **(Rose CCS Project Injection Well No. 02)**
County	Jefferson
Location (RR D, S, A)	Railroad District 3, Section 41, Abstract 266

Latitude / Longitude (NAD83)	29.991017 / -94.298036
API	4224532911

Well Name and Number	Bead Farm #3 **(Rose CCS Project Injection Well No. 03)**
County	Jefferson
Location (RR D, S, A)	Railroad District 3, Section 8, Abstract 658
Latitude / Longitude (NAD83)	30.011778 / -94.297858
API	4224532912

The three injection wells were drilled and completed utilizing the strategy and procedures outlined in this plan. A material selection assessment was used for identifying adquate metallurgy and cement use for each injection well and can be found in Appendix D.4. Applicable and required permits and notifications were submitted to the RRC and EPA. The wells were drilled and tested as described in the pre-operational testing plan described in Section 4.4.

4.2.1 Overview of Injection Well Perforation Strategy

Each injection well was completed with a single completion string and assembly consisting of injection packer, nipple profile, safety injection valve, pressure/temperature gauges, and tubing. Upon issuance of authorization to inject, injection will start based on the intervals and injection schedules referenced below in Table 4-1 through 4-3. Once the target injection volume of CO2 is attained, that injection interval will be plugged back to isolate that interval from subsequent injection intervals shown on Figure 3-9. The next injection interval will then be completed and accessed through additional perforations to establish communication with the reservoir. CO2 will continue into that new injection interval until the target CO2 storage amount has been achieved for that interval. Tables 4-1 and 4-3 summarize the injection sequencing strategy for each injection well. The perforation depths provided in Tables 4-1 to 4-3 are based on the current geologic model described in Site Characterization (Section 2).

Table 4-1: Injection Sequencing Strategy for Injection Well No. 01

Stage	Sand Interval	Top Perf TVDSS (ft)	Bottom Perf TVDSS (ft)	Gross Thickness (ft)	Net Reservoir (ft)	Duration (years)
1	Upper Frio Sand	7,441	8,084	643	353	2.00
2	Upper Frio Sand	7,163	7,348	185	185	2.00
3	Upper Frio Sand	6,938	7,122	185	164	2.00
4	Fleming Sand 3	5,561	5,922	361	120	2.00
5	Fleming Sand 3	5,131	5,492	361	223	2.00
6	Fleming Sand 2	4,187	4,766	579	186	2.00
7	Fleming Sand 1	3,472	3,932	460	293	1.00
TVDSS = True Vertical Depth Subsea						

Table 4-2: Injection Sequencing Strategy for Injection Well No. 02

Stage	Sand Interval	Top Perf TVDSS (ft)	Bottom Perf TVDSS (ft)	Gross Thickness (ft)	Net Reservoir (ft)	Duration (years)
1	Upper Frio Sand	7,540	8,160	620	327	2.00
2	Upper Frio Sand	7,163	7,435	272	251	2.00
3	Upper Frio Sand	6,933	7,142	210	125	2.00
4	Fleming Sand 3	5,670	6,094	424	289	2.00
5	Fleming Sand 3	5,030	5,503	473	165	2.00
6	Fleming Sand 2	4,337	4,916	578	255	2.00
7	Fleming Sand 1	3,481	4,014	532	335	1.00
TVDSS = True Vertical Depth Subsea						

Table 4-3: Injection Sequencing Strategy for Injection Well No. 03

Stage	Sand Interval	Top Perf TVDSS (ft)	Bottom Perf TVDSS (ft)	Gross Thickness (ft)	Net Reservoir (ft)	Duration (years)
1	Upper Frio Sand	7,332	7,986	654	382	2.00
2	Upper Frio Sand	7,011	7,265	254	212	2.00
3	Upper Frio Sand	6,778	6,985	207	143	2.00
4	Fleming Sand 3	5,509	5,896	387	185	2.00
5	Fleming Sand 3	5,055	5,458	404	219	2.00
6	Fleming Sand 2	4,146	4,665	518	163	2.00
7	Fleming Sand 1	3,382	3,893	511	229	1.00
TVDSS = True Vertical Depth Subsea						

4.2.2 Production Casing Design and Completion

The production casing used a combination of 9-5/8-inch (in.) L-80, 13Cr-80, and 25Cr-125. In accordance with the June 25, 2024 guidance provided by EPA regarding Class VI Well Construction, 25Cr was utilized and installed across the entirety of the permitted upper confining zone. Additionally, 25Cr was installed at intra-permitted injection zone shale boundaries which correspond to notional packer placement depths and provide further redundancy. 13Cr was utilized across all perforated intervals.

The well design allowed for monitoring of each casing and tubing annulus for wellbore and mechanical integrity parameters. Appendices D.1 provide the wellbore designs and completion configurations for Injection Wells No. 01, No. 02, and No. 03, respectively, along with the certified well-location plats.

The production casing, or long-string casing, was the final, permanently cemented string of casing to be installed in each well. The production casing was run from the surface to total depth (TD) and cemented back to the surface. The key design criteria for the long string included the use of:

- 25Cr material used across the entirety of the permitted upper confining zone. Additionally, 25Cr was installed at intra-permitted injection zone shale boundaries.
- 13Cr material from the base of the permitted upper confining zone through the Fleming Sand perforation intervals and again across the Frio Sand perforation intervals
- Fiber optic line along the exterior of the production casing, terminating 50 ft into the Anahuac Shale
- CO2-compatible cement systems from 300 ft above the permitted upper confining zone across the entirety of the permitted upper confining zone to TD.

To reduce the potential for CO2 migration out of the injection interval, CO2-compatible cement was run from TD to at least 300 ft above the permitted upper confining zone, to provide a suitable barrier across the upper composite confining zone (UCCZ). By using CO2-compatible material, the cement is protected from carbonic acid, maintaining integrity throughout the life of the Project.

Throughout the life of each well, the Project will have a continual temperature monitoring system in place. The system is designed to measure and record downhole temperatures, as discussed in Section 5 – Testing and Monitoring Plan. Monitoring systems include a fiber optic cable with distributed temperature sensing outside of the 9-5/8 in. production casing. The fiber optic cable was installed at the top of the Anahuac Shale and cemented into place when the 9-5/8 in. casing-cementing job was performed.

The engineering and design parameters for the production casing are summarized in Tables 4-4 and 4-5. These depths are based on final logging of the injection wells.

Table 4-4: Production Casing Specifications

Section	OD (in.)	ID (in.)	Drift (in.)	Weight (lb/ft)	Burst (psi)	Collapse (psi)	Tensile (kips)	Intervals (ft TVD KB)		
								Well No. 01	Well No. 02	Well No. 03
9-5/8-in. L-80	9.625	8.681	8.525	47	6,870	4,760	1,086	0'–3,002'	0'–3,049'	0'–2,934'
9-5/8-in. 13Cr-80	9.625	8.681	8.525	47	6,870	4,760	1,086	3,552'–3,976', 4,233'–4,885', 5,066'–5,311'	3,597'–4,129' 4,347'–4,966' 5,147'–6,428' 6,647'–8,092'	3,476'–3,967' 4,224'–4,803' 4,946'–6,218' 6,437'–8,421'
9-5/8-in. 13Cr-80	9.625	8.535	8.379	53.5	7,930	6,620	1,244	5,311'–6,338' 6,555'–8,533'	8,092'–8,610'	N/A
9-5/8 in. 25Cr-125	9.625	8.535	8.379	53.5	12,740	8,440	1,943	3,002'–3,552', 3,976'–4,233', 4,885'–5,066', 6,338'–6,555'	3,049'–3,597' 4,129'–4,347' 4,966'–5,147' 6,428'–6,647'	2,934'–3,476' 3,967'–4,224' 4,803'–4,946' 6,218'–6,437'
9-5/8-in. L-80	9.625	8.535	8.379	53.5	7,930	6,620	1,244	8,533'–8,654'	8,610–8,731'	8,421'–8,542'

ft = feet; ID = inner diameter; KB = Kelly Bushing; kips = 1,000 pound-force; lb = pound; OD = outer diameter; psi = pounds per square inch

Table 4-5: Production Casing Design Calculations

- 9-5/8-in. Casing
- 9-5/8-in. 47 ppf L80, Semi-Premium, 0 - 3,049 ft
- 9-5/8-in. 53.5 ppf 25Cr-125, Premium, 3,049 ft – 3,597 ft, 4,129 ft – 4,347 ft, 4,966 ft – 5,147 ft, 6,428 ft – 6,647 ft
- 9-5/8-in. 47 ppf L80-13Cr, Premium, 3,597 – 4,129 ft, 4,347 ft – 4,966 ft, 5,147 ft – 6,428 ft, 6,647 ft – 8,610 ft
- 9-5/8-in. 53.5 ppf L80, Premium, 8,610 ft – 8,731 ft

9-5/8-in.	Load Type - Working Stress Design	Load (lb) or (psi)	Depth (ft)	Min SF	Depth (ft)
Burst	Tubing Leak – 2,750 psi Injection Pressure, 6.1 ppg packer fluid	2,750 (psi)	0	2.5	0
	Pressure Test – 4,000 psi with 8.5 ppg FW	4,000 (psi)	0	1.5	8,473
	Casing Frac – 2,533 psi with 7.5 ppg Inj. Fluid	2,533 (psi)	0	2.5	8,473
Tension	Green Cement – 4,000 psi with 10.0 ppg NADF	447 (kips)	0	1.8	0
	Running With Overpull – 100 kips	459 (kips)	0	2.4	0
	Buckling Check – cement to surface, injection temperature	0	0	5.2	0
Collapse	Evacuated Collapse – Full evacuation	4,531 (psi)	8,731	1.0	8,610

kips = 1,000 pound-force; lb = pound; NADF = non-aqueous drilling fluid; ppf = pounds per foot; ppg = pounds per gallon; psi = pounds per square inch; SF = safety factor
Note: maximum anticipated surface pressure = 5,000 psi (production packer setting pressure)

Tables 4-6 to 4-8 provide the production casing cement volume calculations for each injection well.

Table 4-6: Production Casing Cement Volume Calculations for Injection Well No. 01

Section	Footage (ft)	Capacity (ft^3/ft)	Excess (%)	Cement Volume (ft^3)
Surface/Production Casing Annulus	2,203’	0.335	10	812
Open Hole/Casing Annulus	6,451’	0.313	20	3,631
Shoe Track	43’	0.397	0	17
Total Volume, ft^3 (bbl)				3,252 (579)
Actual Volume Pumped, bbl (sacks)				682 (2035)

bbl = barrel; ft^3 = cubic feet

Table 4-7: Production Casing Cement Volume Calculations for Injection Well No. 02

Section	Footage (ft)	Capacity (ft^3/ft)	Excess (%)	Cement Volume (ft^3)
Surface/Production Casing Annulus	2,244	0.335	10	827
Open Hole/Casing Annulus	6,508	0.313	20	2,444
Shoe Track	80	0.397	0	32
Total Volume, ft^3 (bbl)				3,303 (588 bbl)
Actual Volume Pumped, bbl (sacks)				678 (2115)
bbl = barrel; ft^3 = cubic feet				

Table 4-8: Production Casing Cement Volume Calculations for Injection Well No. 03

Section	Footage (ft)	Capacity (ft^3/ft)	Excess (%)	Cement Volume (ft^3)
Surface/Production Casing Annulus	2,170	0.335	10	794
Open Hole/Casing Annulus	6,380	0.313	20	2,408
Shoe Track	80	0.397	0	32
Total Volume, ft^3 (bbl)				3,234 (576)
Actual Volume Pumped, bbl (sacks)				678 (2115)
bbl = barrel; ft^3 = cubic feet				

Centralizer placement for the 9-5/8-in. production casing was designed to accommodate the installation of the fiber optic cable and to promote a continuous, uniform column of cement throughout the production casing annulus achieving greater than 80% displacement efficiency. Clamp centralizers and eccentric centralizers were used to reduce the potential for damage to the fiber optic cable. The placement of centralizers through the production casing is shown in Table 4-9.

Table 4-9: Production Casing Centralizer Program

Centralizer Type	Centralizer Frequency	Injection Well No. 01		Injection Well No. 02		Injection Well No. 03	
		Depth (ft)	Qty	Depth (ft)	Qty	Depth (ft)	Qty
Centralized cross coupling protector	Every other joint	0’–2,065’	25	0’–2,124’	25	0’–2,213’	28
Cast coupling centralizer	Every other joint	0’–2,065’	25	0’–2,124’	25	0’–2,213’	28
Cast coupling centralizer	One every joint	2,188’–6,101’	79	2,245’–6,184’	79	2,213’–6,095’	83
Cable detection clamp	One every joint	3,552’–3,938’ 4,234’–4,846’, 5,066’–6,101’	48	3,597’–4,090’ 4,347’–4,927’ 5,147’–6,184’	48	3,476’–3,928’ 4,224’–4,765’ 4,946’–6,095’	52
Centralizers	One every joint	6,101’ – 8,652’	63	6,184’ – 8,729’	61	6,095’ – 8,539’	59

4.2.3 Injection Tubing Design and Completion

The 7-in. injection tubing size and material were selected for use in the Project wells based on injection volumes, rates, and injectate composition. Consistent with the design approach used for the casing strings, the injectate and the potential for a corrosive environment are important considerations when selecting the metallurgy of the tubing. The design offers protection from the potential corrosive environment of the injectate stream and potential for influx of reservoir brine.

The production tubing is 7-in. 13Cr-80, installed with an injection packer. This design uses 13Cr material or its equivalent in all sections where the CO2 will contact the tubulars. A tubing design analysis was conducted that considered calculated pipe-friction losses, exit velocities, and compression requirements.

Table 4-10: Composition of the Most-Concentrated Constituents in Injectate

Constituents	Mole Percent
Carbon dioxide	>97%
Hydrogen	<1%
Methane	<3%

The input injection parameters from the model are shown in Table 4-11 and 4-12. The calculated injection parameters are shown in Tables 4-13 through Table 4-15 for Injection Wells No. 01 to No. 03, respectively.

Table 4-11: CO2 Standard Conditions

Temperature °F	Pressure psia	Density lbm/ft^3	Enthalpy Btu/lbm	Entropy Btu/lbm-°R
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

°F = degrees Fahrenheit; °R = Rankine; Btu = British thermal unit; ft^3 = cubic feet; lbm = pounds mass; psia = pounds per square inch absolute

Table 4-12: Input Injection Parameters for Injection Wells No. 01, No. 02, and No. 03

Parameter	Injection Well No. 01	Injection Well No. 02	Injection Well No. 03
Max Injection Rate (MMta)	1.67	1.67	1.67
[redacted]	[redacted]	[redacted]	[redacted]
Injection Duration (years)	13	13	13
7-in. Tubing Inner Diameter (in.)	6.276	6.276	6.276
7-in. Tubing Initial Setting Depth (ft)	7,421’	7,516’	7,308’
Wellhead Temperature °F	80	80	80
°F = degree Fahrenheit; psi = pounds per square inch			

Table 4-13: Modeled Injection Rates and Pressures for Injection Well No. 01

Stage	Year After Startup	Max. Rate (MMta)	Avg. Rate (MMta)	Max. BHP (psi)	Avg. BHP (psi)
1	0.00	1.67	1.67	3,720	3,600

Stage	Year After Startup	Max. Rate (MMta)	Avg. Rate (MMta)	Max. BHP (psi)	Avg. BHP (psi)
2	2.00	1.67	1.67	3,543	3,462
3	4.00	1.67	1.67	3,544	3,465
4	6.00	1.43	1.43	2,825	2,667
5	8.00	1.43	1.43	2,627	2,563
6	10.00	1.26	1.26	2,140	2,100
7	12.00	1.1	1.1	1,777	1,731
psi = pounds per square inch					

Table 4-14: Modeled Injection Rates and Pressures for Injection Well No. 02

Stage	Year After Startup	Max. Rate (MMta)	Avg. Rate (MMta)	Max. BHP (psi)	Avg. BHP (psi)
1	0.00	1.67	1.67	3,828	3,666
2	2.00	1.67	1.67	3,588	3,460
3	4.00	1.67	1.67	3,482	3,439
4	6.00	0.94	0.94	2,705	2,648
5	8.00	0.94	0.94	2,623	2,553
6	10.00	1.26	1.26	2,152	2,111
7	12.00	1.32	1.32	1,868	1,791
psi = pounds per square inch					

Table 4-15: Modeled Injection Rates and Pressures for Injection Well No. 03

Stage	Year After Startup	Max. Rate (MMta)	Avg. Rate (MMta)	Max. BHP (psi)	Avg. BHP (psi)
1	0.00	1.67	1.67	3,796	3,602
2	2.00	1.67	1.67	3,518	3,419
3	4.00	1.67	1.67	3,473	3,408
4	6.00	0.94	0.94	2,617	2,581
5	8.00	0.94	0.94	2,568	2,518
6	10.00	0.73	0.73	2,165	2,102
7	12.00	0.88	0.88	1,811	1,725
psi = pounds per square inch					

13Cr material was used for the tubing strings. The tubing was installed using premium connections. A single pressure and temperature gauge was installed above the packer to monitor CO2 injection through the tubing. Tables 4-16 and 4-17 provide the tubing design parameters.

Table 4-16: Tubing Specifications

Section	OD (in.)	ID (in.)	Drift (in.)	Weight (lb/ft)	Burst (psi)	Collapse (psi)	Tensile (kips)	Intervals (ft)		
								Injection Well No. 01	Injection Well No. 02	Injection Well No. 03

7-in. L80-13Cr	7.000	6.276	6.151	26.0	7,240	5,410	604	0–7,421’	0–7,516’	1,610’–7,308’
7” 25Cr-125	7.000	6.276	6.151	26.0	11,640	6,450	944	-	-	0-1,610’
ID = inner diameter; kips = thousand pounds; lb = pound; OD = outer diameter; psi = pounds per square inch 1 maximum setting depth										

Table 4-17: Engineering Design Calculations for Tubing

Production tubing 13Cr, VAM21					
7-in.	Load Type - Working Stress Design	Load (kips) or (psi)	Depth (ft)	Min SF	Depth (ft)
Burst	Tubing	4,750 (psi)	7,500	1.31	7,500
	Injection test	2,500 (psi)	7,500	2.50	7,500
Tension	Buoyed weight + 100kips overpull	275 (kips)	0	2.19	0
	1.67 MMta per well	153 (kips)	0	3.62	0
Collapse	Long shut-in	950* (psi)	7,500	2.03	7,500
	Tubing evacuation	1,050** (psi)	7,500	1.67	7,500
kips = 1,000 pound-force; lb = pound; psi = pounds per square inch; SF = safety factor Note: maximum anticipated surface pressure = 5,000 psi (production packer setting pressure) *With 2,250 psi on the A-Annulus **With 1,800 reservoir pressure (end of life BHP) with .01 psi/ft gas gradient to surface and 2,250 on A-Annulus					

4.2.4 Surface Conductor Pipe Design and Completion

The unconsolidated nature of the sediments in the upper subsurface soil required the installation of a conductor pipe to establish and maintain borehole integrity. A cellar was installed, a 26-in. hole was drilled to depth, and a 20-in. casing was then run and cemented conventionally. A 17 1/2-in. bit was used to drill the next section of the well through the conductor pipe.

4.2.5 Surface Casing Design and Completion

The surface hole was drilled to below the USDW with a 17 1/2-in. bit, with surface casing set at approximately 2,200 ft for each of the injection wells. A string of 13 3/8-in. casing was run and cemented with the casing centered in the open hole with centralizers. The generalized surface casing centralizer placement for the injection wells is provided in Table 4-18.

Table 4-18: Summary of Design for Surface Casing Centralizer

Centralizer Type	Centralizer Frequency	Depth (ft)	Quantity
Bow Spring	One every joint	2,118’–2,203’	2
Bow Spring	One every third joint	126’–2,118’	16
		Total:	18

A summary of surface casing design parameters is presented in Tables 4-19 through 4-21. The engineering calculations for the three injection wells are based on the wellbore conditions and maximum setting depth for the surface casing at Injection Well No. 02.

Table 4-19: Summary of Design for Surface Casing Completion for Injection Wells No. 01, No. 02, and No. 03

Section	OD (in.)	ID (in.)	Drift (in.)	Weight (lb/ft)	Burst (psi)	Collapse (psi)	Tensile (kips)	Intervals (ft)		
								Injection Well No. 01	Injection Well No. 02	Injection Well No. 03
13-3/8-in. J-55	13.375	12.415	12.259	68.0	3,450	1,950	1,069	0'–2,203'	0'–2,244'	0'–2,155'
ID = inner diameter; kips = thousand pounds; lb = pound; OD = outer diameter; psi = pounds per square inch										

Table 4-20: Surface Casing Design Calculations for Injection Wells

13-3/8-in. Casing 13-3/8-in. 68 ppf J-55 BTC, 0 - 2,250 ft					
13-3/8-in.	Load Type - Working Stress Design	Load (lb) or (psi)	Depth (ft)	Min SF	Depth (ft)
Burst	Kick	1,574 (psi)	0	2.2	0
	Pressure Test – 2,750 psi with 10 ppg OBM	2,926 (psi)	2,250	1.2	2,250
Tension	Green Cement – 2,750 psi with 10 ppg OBM	422 (kips)	0	1.4	0
	Running With Overpull – 100 kips	231 (kips)	0	4.6	0
	Buckling Check – cement to surface, max MW 11.0 ppg	86 (kips)	0	12.4	0
Collapse	Cementing Collapse	297 (psi)	2,215	6.5	2,215
	Future Drilling – minimum MW 8.5 ppg	471 (psi)	2,250	4.1	2,250
BTC = buttress-thread and coupled; kips = thousand pounds; lb = pound; MW = mud weight; OBM = Oil Based Mud; ppf = pounds per foot; ppg = pounds per gallon; psi = pounds per square inch; SF = safety factor					

Table 4-21: Surface Casing Cement Volume Calculations for Injection Wells

Section	Barrels	Sacks
Injection Well No. 01	424	1575
Injection Well No. 02	394	1115
Injection Well No. 03	384	1093

4.2.6 Injection Tubing Packer Design and Completion

A wireline-set injection packer was installed with the 7-in. injection tubing. The hydrogenated nitrile rubber (HNBR) element and flow-wetted material components were specifically selected for compatibility with the expected composition of the CO2 injection stream and well fluids in the wellbore. Prior to setting the packer, the tubing annulus was filled with a non-corrosive fluid. Figure 4-1 provides a schematic illustration of a suitable packer design and completion for the Project.

Figure 4-1: Schematic for the Injection Packer Design Tubing

Injection Packer		
	Size	13Cr Halliburton Perma series or suitable equivalent 9-5/8” x 5-1/2”
	Setting	Wireline set
	Sealbore extension	6” x 10’ 13Cr
	Differential pressure	7,500psi
	Min ID (with sealbore)	4.67”
	Temperature	40-350 F

4.2.7 Safety and Continuous Monitoring Device Design and Completion

The following safety and continuous monitoring devices were designed for installation in the injection wells.

4.2.7.1 Safety Injection Valve

A 5.963-in. landing nipple profile was installed above the packer in each 7-in. tubing string to set a safety/injection valve in the injection wells. In the event that injection is interrupted, the injection valve will limit the potential for fluid backflow into the injection tubing string and will keep the reservoir pressurized until equilibrium is achieved. When the safety injection valve is closed, it will maintain the injected CO2 below the valve in a supercritical state.

The safety injection valve was run on wireline and set in a no-go nipple profile located above the injection packer. The valve was designed to the API 14A standard. The operation of the valve consists of a variable orifice that actively adjusts the instantaneous injection flow to maintain a consistent low-back pressure without a flapper or flow tube. The valve will be retrieved each time an intervention is required to isolate an injection zone or make new perforations. Figure 4-2 provides a schematic and specifications for the safety injection valve..

Figure 4-2: Safety Injection Valve



Tool Description	
Valve Description	5.500 Inject**GARD™** Safety Valve with 5.963" RPT Lock
Technical Specifications	
Polished Bore	5.963 inch
Lock Mandrel Type	Halliburton RPT
Overall Length	52 inch
Valve Max OD	4.375 inch
Valve Min ID	2.790 inch
Spacer Max OD	6.025 inch
Spacer Min ID	2.790 inch
Flow Area	6.11 sq. inch
Flow Wetted Materials	Inconel 718, Inconel 925, 6% TC, Boron
Seal Material	Hydrogenated Nitrile Rubber, PEEK
Temperature Rating	-110°F to 275°F
Working Pressure Rating	10,000 psi
Maximum Injection Rate	2.0 MTPA Liquid Carbon Dioxide
QMS System	API Q1/ISO 9001:2015 (E)
Industry Standards	API-14A, Validation Grade V3 SSISV

4.2.7.2 Downhole Pressure and Temperature Gauge Design and Completion

A single pressure and temperature gauge was run above the injection packer in each injection well to provide real-time bottomhole monitoring data. The gauge was ported to the interior of the injection tubing and pressure and temperature measurements will be fed to the surface using the installed tubing encapsulated conductor line. Figure 4-3 provides specifications of the downhole pressure and temperature gauge.

Figure 4-3: Downhole Pressure and Temperature Gauge

GAUGE OPSIS VENDOR PN WDB206-10-150



Design Specifications

SAP Part Number: 102815210
Legacy Part Number: OPS34S1015000

Name	Value
GAUGE SETUP	SINGLE
CALIBRATION PRESSURE RANGE	200-10000 PSI
CALIBRATION TEMPERATURE RANGE	25-150 DEG. C
SERVICE	H2S/CO2
SERVICE REMARKS	H2S AND/OR CO2 SERVICE BASED ON CUSTOMER DEFINED, WELL SPECIFIC CONDITIONS. APPLICATIONS MUST BE REVIEWED FOR SPECIFIC ENVIRONMENTAL COMPATIBILITY.
MATERIAL	MP-35-N
PRESSURE READING ACCURACY	0.015 % FULL SCALE
ACHIEVABLE PRESSURE RESOLUTION	LESS THAN 0.006 PSI/SEC
PRESSURE DRIFT AT MAX TEMP AND PRESSURE	0.02% FULL SCALE/YEAR
TEMPERATURE ACCURACY	0.5 DEG. C
ACHIEVABLE TEMPERATURE RESOLUTION	LESS THAN 0.005 DEG. C/SEC
MAXIMUM OD	0.765 inch
MINIMUM STORAGE TEMPERATURE	-40
MINIMUM OPERATING TEMPERATURE	-20 Deg. C
MAXIMUM STORAGE TEMPERATURE	65 Deg. C
MAXIMUM OPERATING RANDOM VIBRATION	10Grms
MAXIMUM OPERATING SHOCK	500g 2MS 1/2 SINE 6-AXIS
MAXIMUM SAMPLING RATE	0.24 second
OPERATING VOLTAGE	18:60 volt DC
MAXIMUM ACTIVE CURRENT CONSUMPTION	0.02 ampere
COMMUNICATION PROTOCOL	MODBUS RTU
GAUGE SIZE	0.75 inch
LENGTH	13.742 inch
APPROXIMATE PART WEIGHT	2.0 pound
CONNECTION TYPE	CABLE TERM
OUTSIDE DIAMETER	0.765 inch

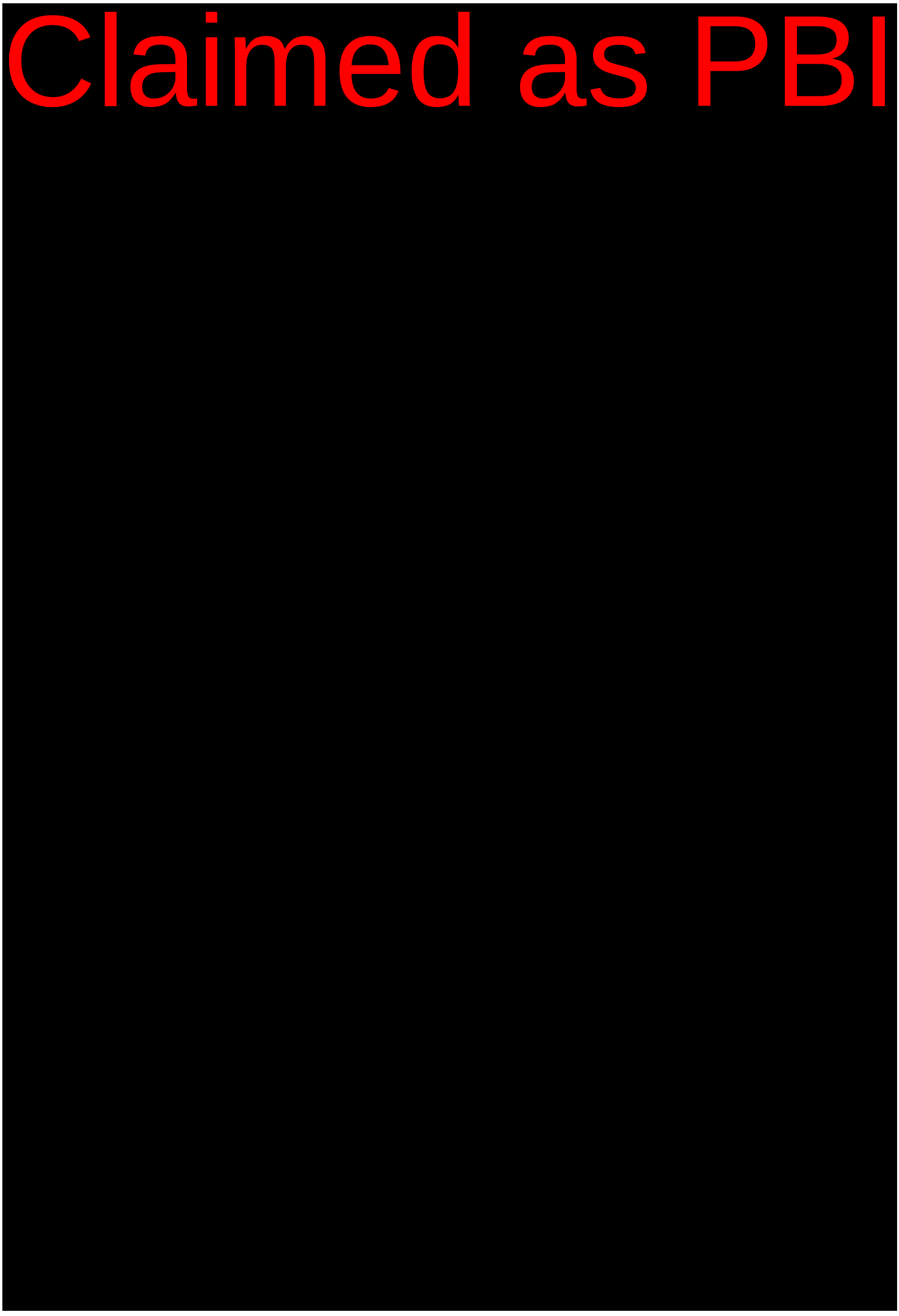
4.2.7.3 Fiber Optic Design and Completion

Fiber optic cable was run on the production casing string in each injection well to monitor temperature.

4.2.8 Wellhead Equipment Design and Completion

The wellhead was designed to manage working pressures and provide a high degree of mechanical integrity for the injection well. The wellhead equipment was manufactured with stainless-steel components across the hanger, casing spool, and tree assembly and Inconel cladding as described in Figure 4-4 below. The wellheads were configured as illustrated in Figure 4-4.

Figure 4-4: Typical Wellhead Configuration for Injection Wells



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4.3 Well Drilling and Completion Design

The drilling and completion design for each injection well is described in the following sections. Appendix D.1 provides the final well design and completions details.

4.3.1 Drilling and Completion Design for Injection Well No. 01

Claimed as PBI



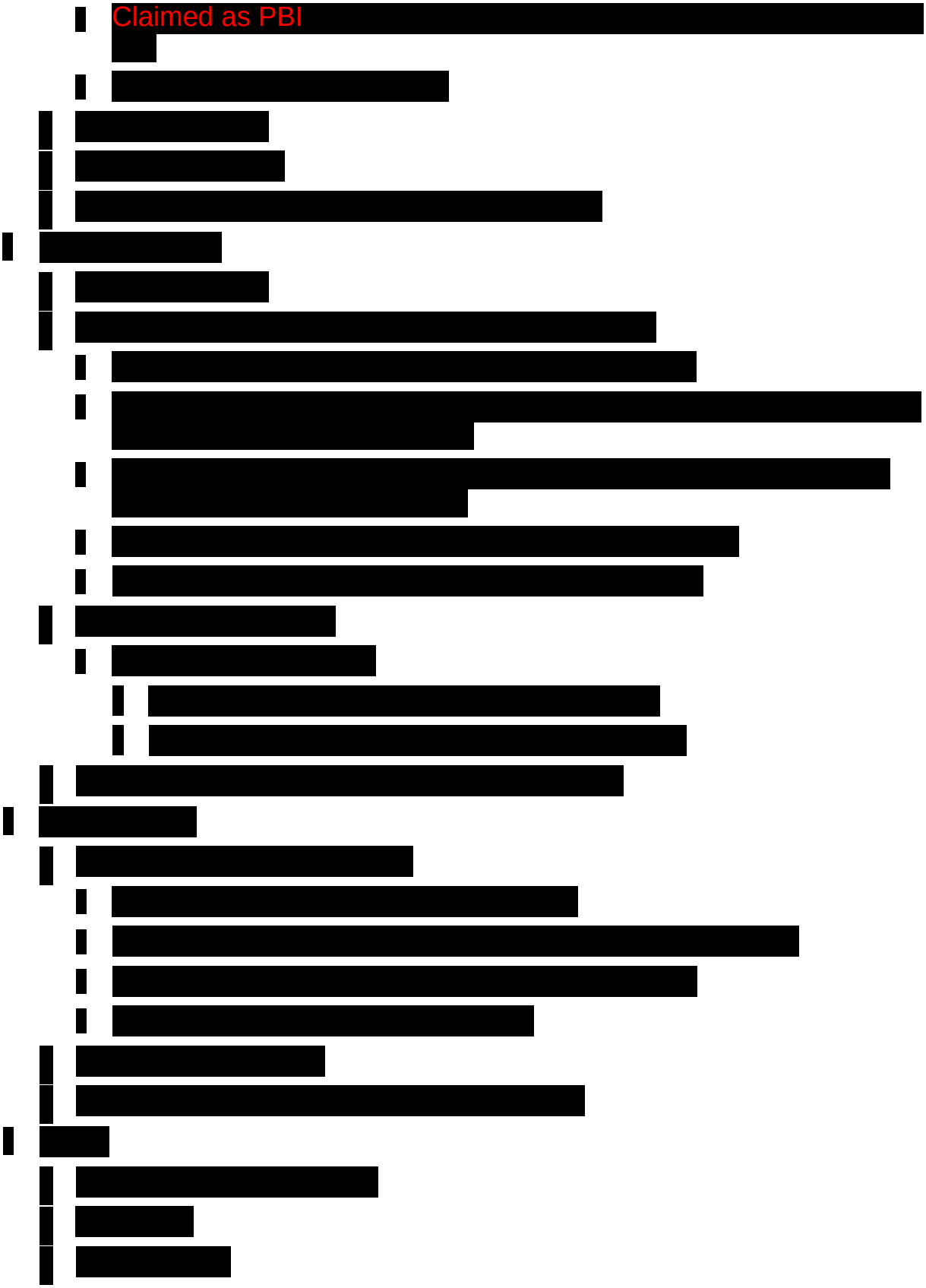
Claimed as PBI

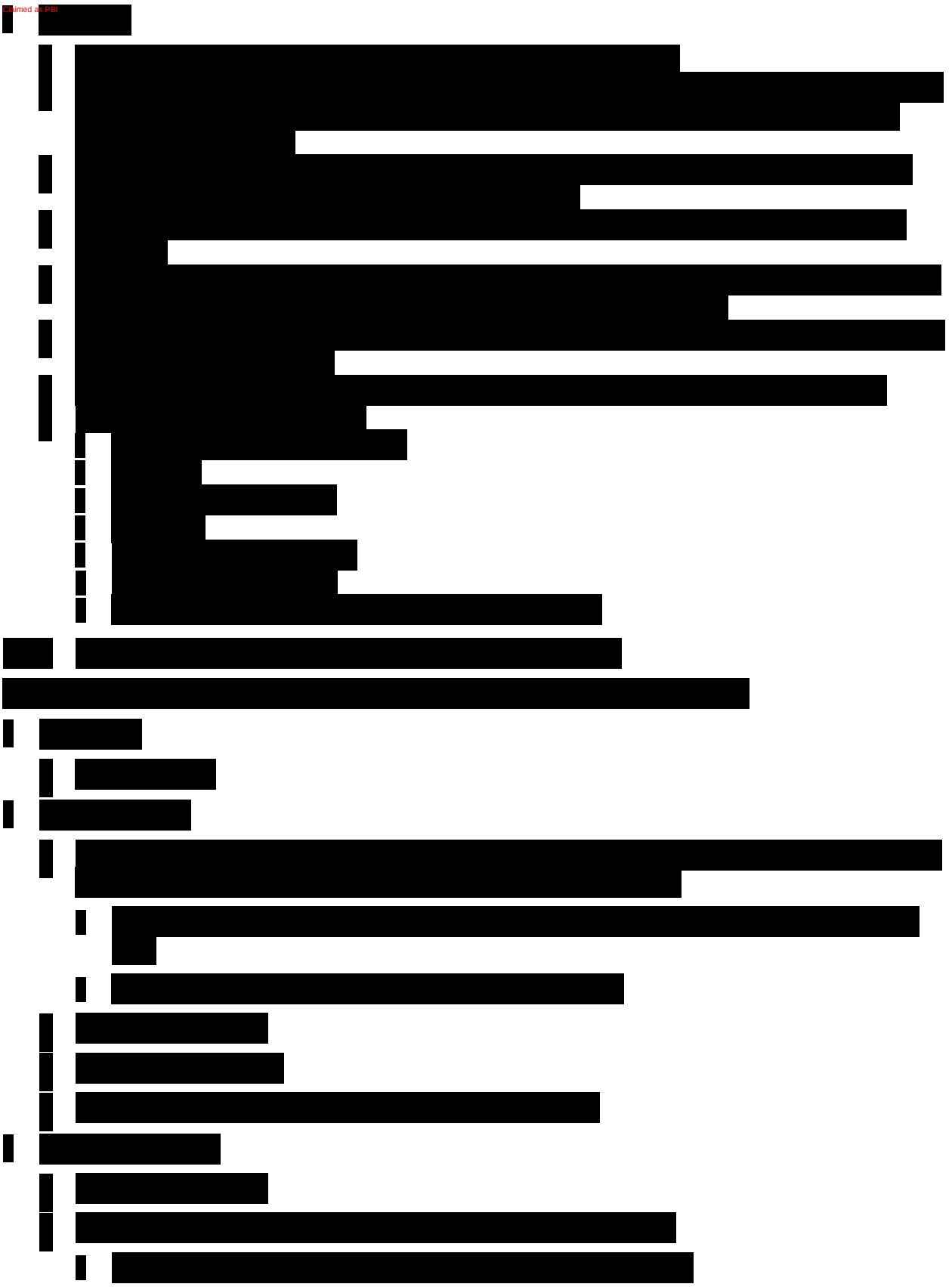


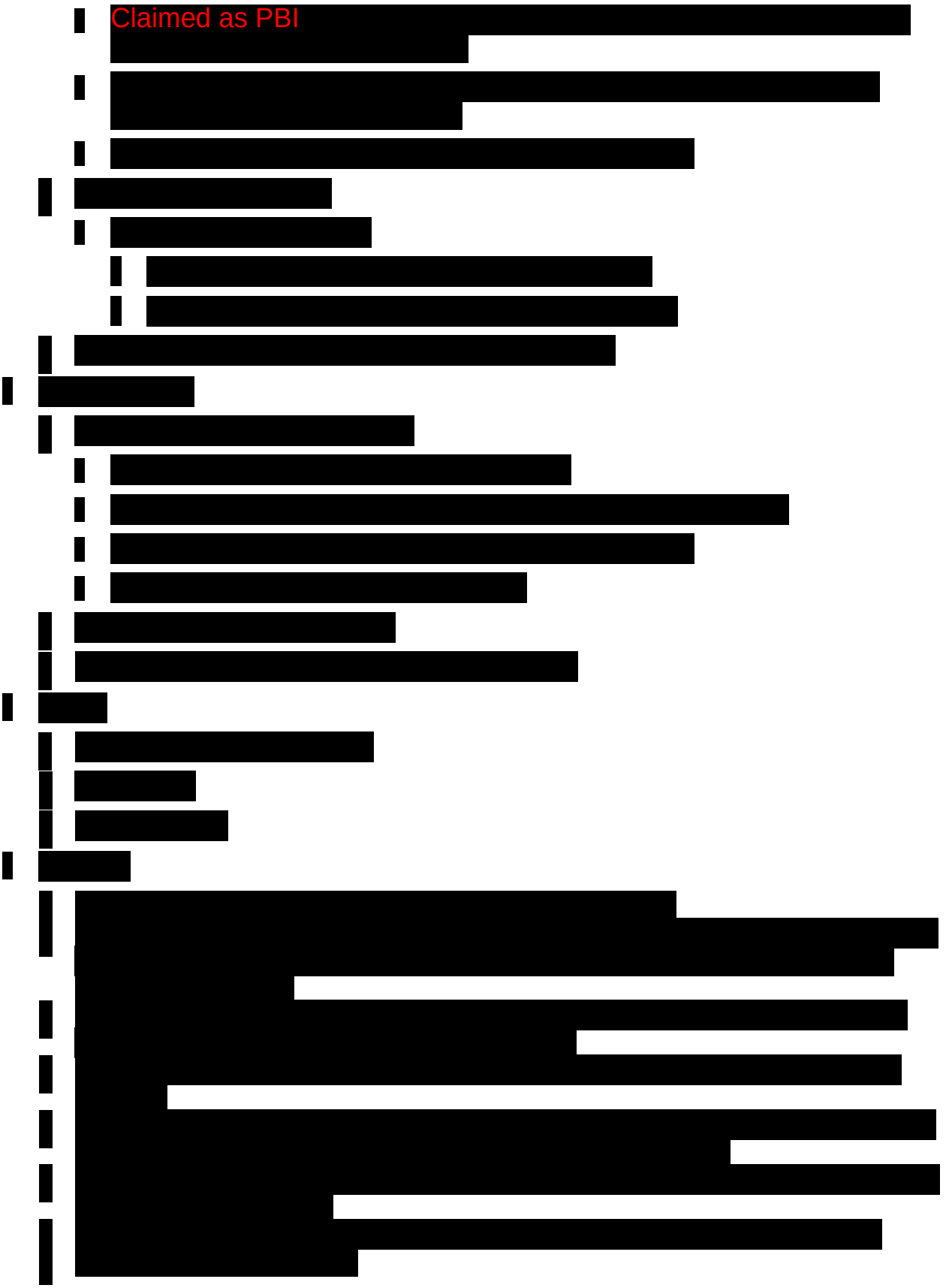
4.3.2 Drilling and Completion Design for Injection Well No. 02

Claimed as PBI




Claimed as PBI


Claimed as PBI


Claimed as PBI

Claimed as PBI

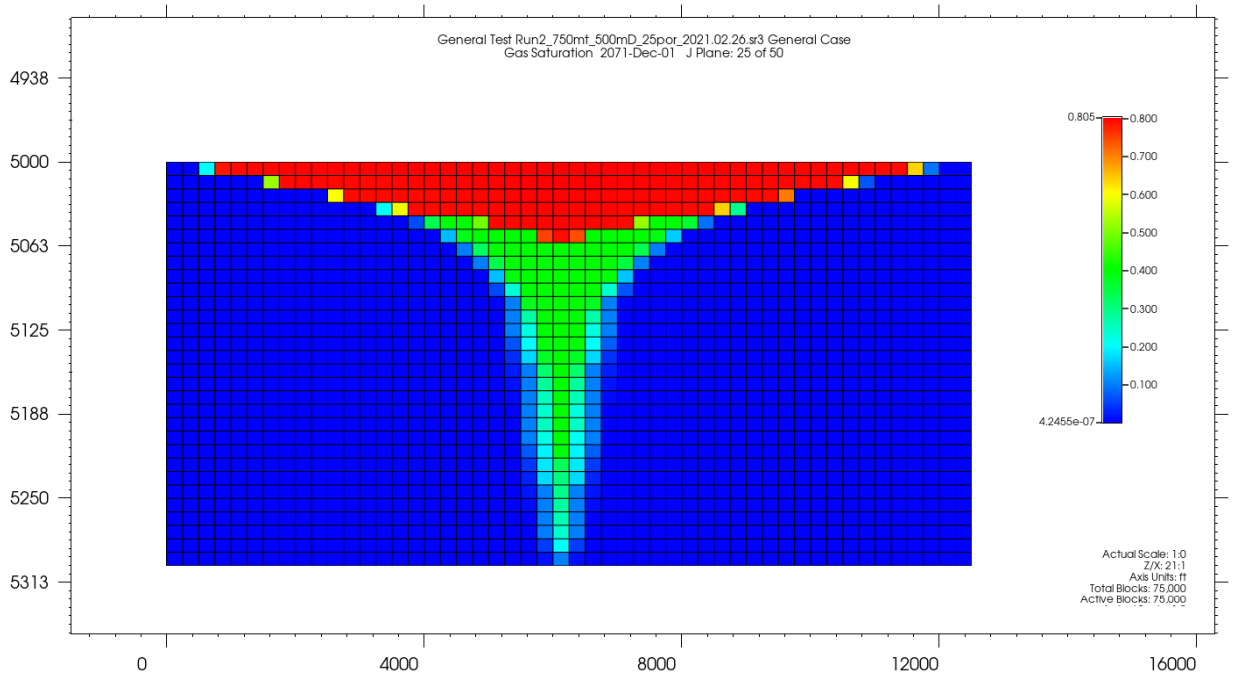
A detailed drilling and completion schematic for each injection well is included in Appendix D.1.

4.3.4 Injection Well Completion Stage and Injection Interval

The density difference between injected CO2 and connate brine, in addition to the relatively high vertical permeability in the Fleming and Upper Frio sands, allows the CO2 to migrate vertically to the top of each discrete injection interval and laterally under the confining layer (or baffle) that exists at the top of that injection interval.

The result is a significant “mushroom cap” effect wherein gravity override of the less dense CO2 plume occurs due to gravity segregation over distance, with the top of the mushroom expanding outwardly from the injection well (Figure 4-5). Additional details regarding the predicted plume movement and pressurization of the injection zone are presented in Section 3 – Area of Review and Corrective Action Plan.

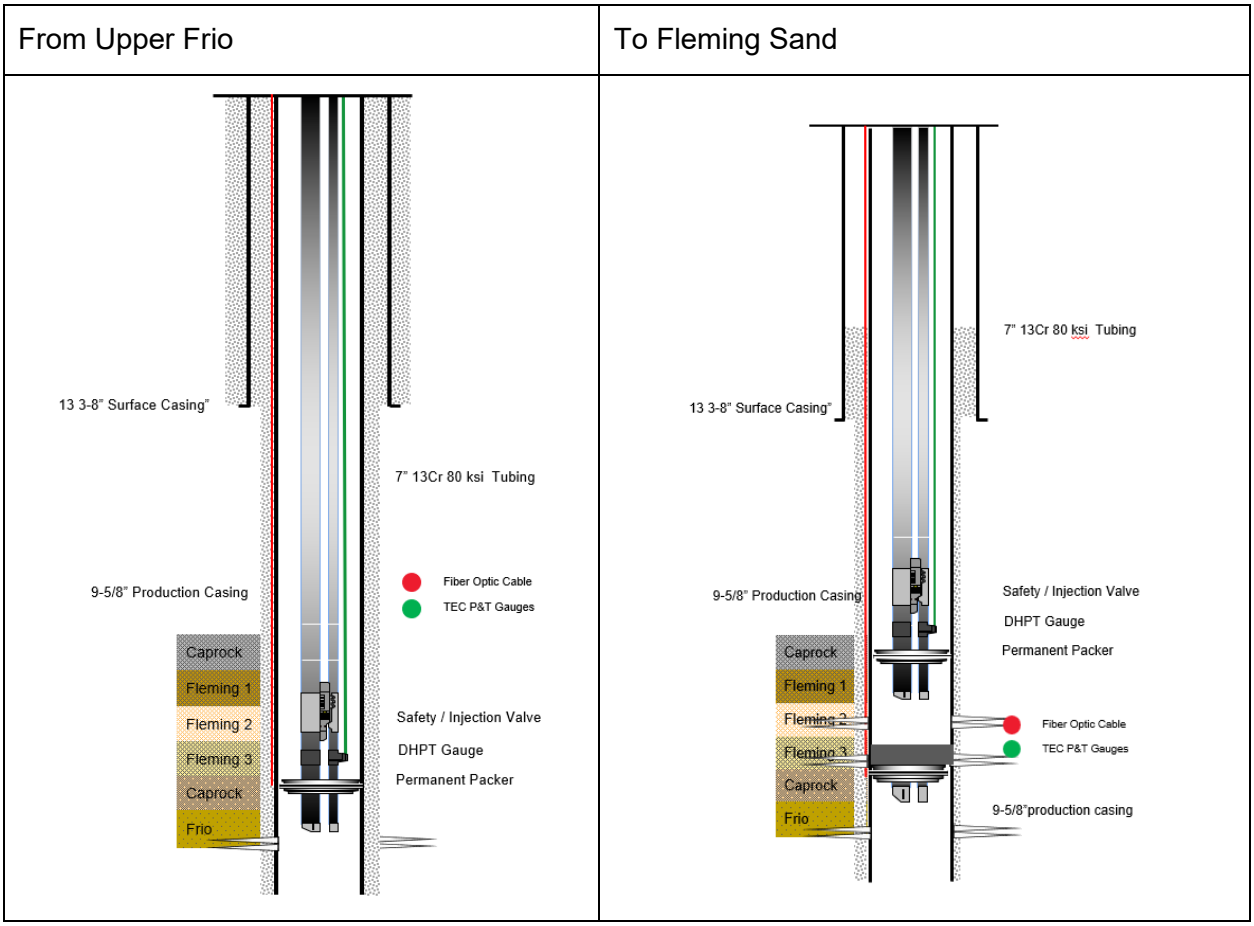
Figure 4-5: Typical Plume Profile in High Permeability Formations



To maximize the use of pore space and minimize the cone-of-influence pressure that is created due to injection, discrete injection stages must be completed over limited periods of the total operational life of the Project. Reservoir management is important for sequestration operations in thick, high permeability, poorly consolidated sand formations. Through modeling of injection in the reservoir, predictions of the CO2 plume development were generated based on this well-specific completion strategy.

As mentioned above, Figure 4-6 illustrates the sequencing plan for completing the four target injection stages within the injection interval of the injection zone. At the end of this initial injection period and each subsequent injection period, workover operations will be executed to recomplete into a new stage. A plug will be set to isolate each injection stage that has met the CO_2 storage target and the 9-5/8 in. production string will be perforated to access the next injection stage. This process will be repeated until the end of the Project operating life. Figure 4-6 depicts this process in a general form.

Figure 4-6: Operational Completion Strategy for Injection Wells



Each discrete injection stage was selected to maximize the use of the pore space and collectively maximize the usage of the acreage position for CO_2 sequestration. A summary of the planned injection stages and duration by sand unit are listed in Tables 4-22 through 4-35. These stages are based on the current geologic model and stratigraphic well results.

Table 4-22: Injection Intervals for Injection Well No. 01

Completion Stage	Completion Years after Startup	Injection Duration (years)	Top Depth TVDSS (ft)	Bottom Depth TVDSS (ft)	Net Reservoir (ft)
Upper Frio Sand	0.00	2.00	7,441	8,084	353

Completion Stage	Completion Years after Startup	Injection Duration (years)	Top Depth TVDSS (ft)	Bottom Depth TVDSS (ft)	Net Reservoir (ft)
Upper Frio Sand	2.00	2.00	7,163	7,348	185
Upper Frio Sand	4.00	2.00	6,938	7,122	164
Fleming Sand 3	6.00	2.00	5,561	5,922	120
Fleming Sand 3	8.00	2.00	5,131	5,492	223
Fleming Sand 2	10.00	2.00	4,187	4,766	186
Fleming Sand 1	12.00	1.00	3,472	3,932	293
TVDSS = True Vertical Depth Subsea					

Table 4-23: Injection Intervals for Injection Well No. 02

Completion Stage	Completion Years after Startup	Injection Duration (years)	Top Depth TVDSS (ft)	Bottom Depth TVDSS (ft)	Net Reservoir (ft)
Upper Frio Sand	0.00	2.00	7,540	8,160	327
Upper Frio Sand	2.00	2.00	7,163	7,435	251
Upper Frio Sand	4.00	2.00	6,933	7,142	125
Fleming Sand 3	6.00	2.00	5,670	6,094	289
Fleming Sand 3	8.00	2.00	5,030	5,503	165
Fleming Sand 2	10.00	2.00	4,337	4,916	255
Fleming Sand 1	12.00	1.00	3,481	4,014	335
TVDSS = True Vertical Depth Subsea					

Table 4-24: Injection Intervals for Injection Well No. 03

Completion Stage	Completion Years after Startup	Injection Duration (years)	Top Depth TVDSS (ft)	Bottom Depth TVDSS (ft)	Net Reservoir (ft)
Upper Frio Sand	0.00	2.00	7,332	7,986	382
Upper Frio Sand	2.00	2.00	7,011	7,265	212
Upper Frio Sand	4.00	2.00	6,778	6,985	143
Fleming Sand 3	6.00	2.00	5,509	5,896	185
Fleming Sand 3	8.00	2.00	5,055	5,458	219
Fleming Sand 2	10.00	2.00	4,146	4,665	163
Fleming Sand 1	12.00	1.00	3,382	3,893	229
TVDSS = True Vertical Depth Subsea					

4.4 Pre-Operational Testing Plan

The scope of the pre-operational testing plan included geophysical and core data collection in the stratigraphic well, fluid sampling at target intervals, and pressure testing to assess the injection intervals. The Testing and Monitoring Plan (Section 5 – Testing and Monitoring Plan) provides the data collection activities for the pre-operational phase and the operational phase of the Project. A summary of that discussion is provided below for ease of review, with reference to the complete discussion in Section 5 for the pre-operational testing plan.

4.4.1 Tests During Well Drilling and Construction

A variety of geophysical well logs were collected during the construction of the stratigraphic well to verify and evaluate further the depth, thickness, porosity, permeability, lithology, and formation fluid salinity in the relevant geologic formations. Data collected from the stratigraphic well was also used to appropriately construct the injection wells and provide data to verify the design for mechanical integrity purposes.

The drilling procedure in Appendix D.2 discusses the detailed coring procedures for the stratigraphic well (Bead Farm Co. #1). The coring depths, formations, and footages for full core samples are provided in Table 4-25. The cores taken from the stratigraphic well were near the injection wells and represent the properties of the injection and confining zones near the injection wells. Data acquisition from the stratigraphic well included sufficient and representative information on the injection and confining zones porosities, permeabilities, petrologies, and mineralogies.

Table 4-25: Summary of Full Core Sample Depths from Stratigraphic and Injection Well

Interval	Bead Farm Co #1		Labelle Properties Ltd. #1		Bead Farm Co #2		Bead Farm #3	
	(ft TVD)	Footage (ft)	(ft TVD)	Footage (ft)	(ft TVD)	Footage (ft)	(ft TVD)	Footage (ft)
Fleming Sand Seal Complex	3,092	110	-	-	3,120	31	3,333	60
Fleming Sand 1	-	-	3,565	28	-	-	3,503	68
Fleming Sand Shale 2	4,060	60	-	-	-	-		-
Fleming Sand 2	4,456	32	-	-	4,350	53	-	-
Fleming Sand 3	5,186	31	-	-	-	-	-	-
Anahuac Seal	6,266	36	-	-	-	-	-	-
Upper Frio	7,255	54	7,481	56	7,586	60	7,770	44

4.4.2 Injection and Confining Zone Core Sampling

During the drilling and completion of the injection wells, a subset of the stratigraphic well's logging and coring data collection plan were used to verify certain key parameters for injection well performance and AoR modeling. The following geophysical logs were run for each injection well. The open-hole logging plan is detailed in Table 4-26. The cased-hole logging plan is detailed in Table 4-27.

Table 4-26: Open-Hole Logging Plan for Injection Wells No. 01, No. 02, and No. 03

Section	Open-Hole Logs	Injection Well No. 01 ft TVD KB	Injection Well No. 02 ft TVD KB	Injection Well No. 03 ft TVD KB
17-1/2 in. hole	• Gamma Ray • Resistivity • Spontaneous Potential • Caliper	0–2,203	0–2,244	0–2,155
12-1/4 in. hole	• Gamma Ray • Resistivity • Density • Neutron • Magnetic Resonance • Dipole Sonic • Borehole Imaging • Caliper • Formation Pressure • Fluid Samples	2,203–8,654	2,244–8,752	2,155–8,565

Table 4-27: Cased-Hole Logging Plan for Injection Wells No. 01, No. 02, and No. 03

Section	Cased-Hole Logs	Injection Well No. 01 ft TVD KB	Injection Well No. 02	Injection Well No. 03
13-3/8 in. surface casing	• CBL, VDL, Temp,	0–2,203	0–2,244	0–2,155
9-5/8 in. production casing	• CBL, VDL, Temp, • Ultrasonic Casing Inspection	0–8,586	0–8,628	0–8,492
7-in. production tubing and 9-5/8 in.	• Thru-Tubing Casing Inspection • Pulse Neutron / OA	0–8,535	0–8,585	0–8,203
CBL = cement bond log; VDL = Variable Density Log; OA = Oxygen Activation				

4.4.3 Injection Zone Characterization

The injection zone was characterized in detail using the data acquired in the stratigraphic well (Bead Farm Co. #1) and outlined in Appendix D.2. The location of the stratigraphic well relative to the injection wells is provided on Figure 5-3. ExxonMobil collected characterization data for each injection interval of the injection wells including formation fluid temperature, pH, specific conductivity and formation pressure. All target injection formations are 100% brine saturated.

4.4.4 Fracture Pressure, Fluid Characteristics, and Downhole Conditions

ExxonMobil characterized the formation fluids in the injection zone using samples collected from the stratigraphic well. ExxonMobil used these data to evaluate the compatibility of the injectate with the formation fluids in the injection zone. These groundwater samples that were collected during the pre-operation phase of the Project will form the baseline data for comparison with water quality data representing the operating and post-operating phases of the Project. In general, the baseline data established include pressure, temperature, fluid, and physical characteristics present in the injection intervals and above the UCCZ from a single sample event at the stratigraphic well and a routine sampling frequency for the USDW monitoring wells.

The sampling and analysis plan for the water sample collected above the UCCZ at the stratigraphic well is specified in Table 4-28. The USDW monitoring wells were drilled and monitored to provide a representative baseline of geochemical concentrations and pressure conditions in the AoR and surrounding area as described in Section 5 – Testing and Monitoring Plan. The analyses of geochemical and water quality parameters for the groundwater samples from the USDW monitoring wells are specified in Section 5. Similarly, groundwater characterization between the lowest most USDW and the top of the UCCZ was tested and sampled inside the limits of the AoR to establish a representative baseline of geochemical and pressure conditions of the monitoring zone in the local Project area.

Table 4-28: Sampling and Analysis Plan for UCCZ Water Sample Collected from Stratigraphic Well

Parameter/Analyze	Analytical Method
Total dissolved solids, alkalinity, electrical conductivity, temperature, pH	Standard lab analyses
Gas composition (CO2, CH4, O2, N2)	Gas chromatography
Dissolved cations (i.e., Ba, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, P, K, Si, Na, Sr, V, Zn)	Ion chromatography
Dissolved anions (HCO3, B(OH)4, Br, CO3, Cl, F, I, NO3, NO2, PO4, SO4, S)	Ion chromatography
B(OH)4 = Tetrahydroxyborate; Ba = Barium; Br = Bromide; Ca = Calcium; Cd = Cadmium; CH4 = Methane; Cl = Chloride; CO2 = Carbon dioxide; CO3 = Carbonate; Co = Cobalt; Cr = Chromium; Cu = Copper; F = Fluoride; Fe = Iron; HCO3 = Bicarbonate; I = Iodide; K = Potassium; Li = Lithium; Mg = Magnesium; Mn = Manganese; Mo = Molybdenum; N2 = Nitrogen; Na = Sodium; Ni = Nickel; NO2 = Nitrite; NO3 = Nitrate; O2 = Oxygen; P = Phosphorus; Pb = Lead; PO4 = Phosphate; S = Sulfur; Si = Silicon; SO4 = Sulfate; Sr = Strontium; V = Vanadium; Zn = Zinc.	

The groundwater samples were analyzed in the field for certain physical parameters including temperature, pH, alkalinity, dissolved oxygen, and electrical conductivity. Laboratory-based analyses included total dissolved solids, concentrations of cations, anions, CO2, and methane. Samples for cations and anions will be collected in appropriate acid-washed bottles to eliminate possible contamination.

4.4.5 Injection and Confining Zone Formation Testing

ExxonMobil collected pre-operational formation tests and data logging from the stratigraphic well to provide needed data on the geologic and hydrogeologic properties of subsurface formations. A step-rate test and a pressure fall-off test were performed in three intervals (Upper Frio, Fleming 3, and Fleming 2) at the stratigraphic test well . As an example, Tables 4-29 and 4-30 provide the step-rate injection test and pressure fall-off test parameters for the Fleming 2

interval. A discussion of all injectivity tests performed at the stratigraphic test well are provided in Appendix B.3.

The final rates and durations for each test are made during the operation based on real-time downhole pressure data, ensuring that sufficient time is allowed for downhole stabilization at each rate. No minimum hold time is explicitly prescribed, as it depends on individual well performance. The target injection intervals were found to be exceptionally productive and exhibited very low pressure response to the injection rate. Therefore, it was necessary to ramp up quickly to build the amplitude of pressure disturbance needed to monitor and analyze the performance.

Table 4-29: Step-Rate Injection Test in Fleming 2 at the Stratigraphic Well

Claimed as PBI

Table 4-30: Pressure Fall-Off Test in Fleming 2 at the Stratigraphic Well

Claimed as PBI

Pressure transient well testing (e.g., a pressure fall-off test) was completed in the stratigraphic well and in each of the injection wells as a part of completion activities. These tests are intended to confirm reservoir and operational parameters used in the permitting process and provide needed data on the geologic and hydrogeologic properties of subsurface formations. The following injection well fall-off pressure test procedures were completed:

- A non-hazardous test fluid was completed during the injection test.
- Injection Well Fall-Off Pressure Test:

- The purpose of this test is to evaluate the injectivity index, skin, and permeability-thickness of the injection intervals.
- For each injection zone, an injectivity test was performed.
- The wells were shut-in and pressure fall-off was recorded with downhole gauges over sufficient time for proper analysis.

4.4.6 Quality Assurance Surveillance Plan

ExxonMobil developed the Quality Assurance Surveillance Plan (QASP) in Appendix E in this application as a supplement to the testing and monitoring requirements of this section as well as Section 5 – Testing and Monitoring Plan and Section 7 – Post-Inject Site Care and Site Closure Plan. The goal of the QASP is to provide reliable data to verify that the Project is operating as permitted without endangerment to USDWs. The QASP provides a verifiable set of standards and controls that include the technologies, methodologies, frequencies, sample quality assurance, and procedures to demonstrate the collection data activities will provide accurate and reliable information about the Project operations. The QASP is unique to the Project, informed by site-specific details, monitoring technologies selected, and will be updated as the Project evolves in concert with the Testing and Monitoring Plan.

4.5 Injection Well Operating Strategy

4.5.1 Injection Rate and Pressure

Table 4-31 provides the proposed operations for the injection wells including injection rate and pressure by well. The maximum injection rates for the injection intervals of each well ranges from 0.73 to 1.67 MMta. The average injection rate range is from 0.73 to 1.67 MMta. Both the maximum and average injection rates are predicted to result in reservoir pressure rises that are below 90% of the critical fracture pressure, shown in Table 4-31. Both the injection rates and pressures are within the operating window of the injection wells.

Table 4-31: Summary of Injection Parameters for Injection Wells No. 01, No. 02, and No. 03

Stage	Stage	Parameter	Injection Well No. 01	Injection Well No. 02	Injection Well No. 03
1	Frio-1	Maximum Injection Zone Rate (MMta)	1.67	1.67	1.67
		Average Injection Zone Rate (MMta)	1.67	1.67	1.67
		Maximum Allowed BHP (psi)	4,620	4,670	4,553
		Maximum Modeled BHP (psi)	3,720	3,828	3,796
2	Frio-2	Maximum Injection Zone Rate (MMta)	1.67	1.67	1.67
		Average Injection Zone Rate (MMta)	1.67	1.67	1.67
		Maximum Allowed BHP (psi)	4,463	4,463	4,368
		Maximum Modeled BHP (psi)	3,543	3,588	3,518

Stage	Stage	Parameter	Injection Well No. 01	Injection Well No. 02	Injection Well No. 03
3	Frio-3	Maximum Injection Zone Rate (MMta)	1.67	1.67	1.67
		Average Injection Zone Rate (MMta)	1.67	1.67	1.67
		Maximum Allowed BHP (psi)	4,323	4,320	4,223
		Maximum Modeled BHP (psi)	3,544	3,482	3,473
4	Fleming 3-1	Maximum Injection Zone Rate (MMta)	1.43	0.94	0.94
		Average Injection Zone Rate (MMta)	1.43	0.94	0.94
		Maximum Allowed BHP (psi)	3,417	3,484	3,386
		Maximum Modeled BHP (psi)	2,825	2,705	2,617
5	Fleming 3-2	Maximum Injection Zone Rate (MMta)	1.43	0.94	0.94
		Average Injection Zone Rate (MMta)	1.43	0.94	0.94
		Maximum Allowed BHP (psi)	3,154	3,092	3,108
		Maximum Modeled BHP (psi)	2,627	2,623	2,568
6	Fleming 2	Maximum Injection Zone Rate (MMta)	1.26	1.26	0.73
		Average Injection Zone Rate (MMta)	1.26	1.26	0.73
		Maximum Allowed BHP (psi)	2,577	2,668	2,551
		Maximum Modeled BHP (psi)	2,140	2,152	2,165
7	Fleming 1	Maximum Injection Zone Rate (MMta)	1.10	1.32	0.88
		Average Injection Zone Rate (MMta)	1.10	1.32	0.88
		Maximum Allowed BHP (psi)	2,107	2,113	2,053
		Maximum Modeled BHP (psi)	1,777	1,868	1,811

The proposed continuous monitoring and recording devices will demonstrate internal mechanical integrity [40 CFR 146.88(e)] and that the well is equipped with shutoffs and safety devices that are linked to final operating limits specified in the permit for each injection well. The anticipated bottomhole injection pressures and interval-specific pressure constraints are shown in Tables 4-32 through 4-34. The injection depths are based on the current geologic model and stratigraphic well results. The injection rate schedule presented in this Application is based on

defined rate limitations without the modeled projections predicting sufficiently high reservoir pressures that result in maximum BHP constraining predicted well operations.

Table 4-32: Injection Pressures and Pressure Constraints by Injection Stage for Injection Well No. 01

Completion Stage	Completion Years after Startup	Top Depth BGL (ft)	Claimed as PBI	Fracture Pressure (psi)	Maximum Allowable BHP (psi)
Upper Frio Sand	0	7,440		5,134	4,620
Upper Frio Sand	2	7,186		4,958	4,463
Upper Frio Sand	4	6,961		4,803	4,323
Fleming Sand 3	6	5,584		3,797	3,417
Fleming Sand 3	8	5,154		3,505	3,154
Fleming Sand 2	10	4,210		2,863	2,577
Fleming Sand 1	12	3,495		2,342	2,107
BGL = below ground level; ft = feet; psi = pounds per square inch					

Table 4-33: Injection Pressures and Pressure Constraints by Injection Stage for Injection Well No. 02

Completion Stage	Completion Years after Startup	Top Depth BGL (ft)	Claimed as PBI	Fracture Pressure (psi)	Maximum Allowable BHP (psi)
Upper Frio Sand	0	7,520		5,189	4,670
Upper Frio Sand	2	7,186		4,958	4,463
Upper Frio Sand	4	6,956		4,800	4,320
Fleming Sand 3	6	5,693		3,871	3,484
Fleming Sand 3	8	5,053		3,436	3,092
Fleming Sand 2	10	4,360		2,965	2,668
Fleming Sand 1	12	3,504		2,348	2,113
BGL = below ground level; ft = feet; psi = pounds per square inch					

Table 4-34: Injection Pressures and Pressure Constraints by Injection Stage for Injection Well No. 03

Completion Stage	Completion Years after Startup	Top Depth BGL (ft)	Claimed as PBI	Fracture Pressure (psi)	Maximum Allowable BHP (psi)
Upper Frio Sand	0	7,331		5,058	4,553
Upper Frio Sand	2	7,034		4,853	4,368
Upper Frio Sand	4	6,801		4,693	4,223
Fleming Sand 3	6	5,532		3,762	3,386
Fleming Sand 3	8	5,078		3,453	3,108
Fleming Sand 2	10	4,169		2,835	2,551
Fleming Sand 1	12	3,405		2,281	2,053
BGL = below ground level; ft = feet; psi = pounds per square inch					

4.5.2 CO2 Volume

ExxonMobil plans to inject approximately 53 million metric tonnes of CO2 over the life of the Project. It is projected that the CO2 will be injected and will remain in a supercritical state through the life of the Project. The Fleming and Upper Frio sands have relatively high porosity and high permeability. These reservoir properties and the lateral extent of the injection zone are projected to allow the system to store significant volumes of CO2 with limited reservoir pressure rise and to result in relatively rapid pressure fall-off upon shut-in. The CO2 volume was determined to meet the requirements of managing the threat of endangerment to USDW.

4.5.3 Annulus Pressure

The annulus pressure will be adjusted to be more than 100 psi above the wellhead injection pressure, with a maximum allowable pressure of 2,750 psi. The minimum annulus pressure is 500 psi, as reported in Section 5 – Testing and Monitoring Plan.

4.5.4 Well Stimulation Procedures

In the event it is necessary to achieved desired injectivity, ExxonMobil may stimulate the injection zone for the Rose CCS Project (Appendix D.3). Stimulation may be conducted if injection impairment is observed during the life of the well. Additional details on the stimulation plan can be found in Appendix D.3. Potential causes for injection reduction are:

- Formation damage (e.g., fines migration, scaling, debris in injection stream)
- Geochemical reactions due to fluid / reservoir incompatibility
- Salt precipitation due to in situ brine vaporization
- Reservoir compartmentalization or facies variation
- Shale swelling
- Others

ExxonMobil, will provide advance notice of the proposed stimulation to the UIC Program Director in writing at least 30 days prior to implementation in accordance with 40 CFR 146.91(d)(2). The detailed stimulation plan is provided in Appendix D and incorporates the following:

- Stimulation design to ensure the treatment will not interfere with containment
- Stimulation fluids detail (e.g., volumes, concentrations, additives)
- Stimulation fluid / well material compatibility analysis
- Well Integrity analysis (e.g., casing / tubing stress analysis)
- Stimulation procedure

The stimulation fluids will be an acid, most likely HCl, or a water-based fluid treated as needed with the necessary chemicals and/or additives to achieve the desired results. Any stimulation would not interfere with the containment of the project. A high-level procedure is as follows and, as mentioned in the paragraph above, a case-specific stimulation plan procedure along with a detailed description of fluids to be used will be provided to the UIC Program Director should a stimulation become necessary:

1. Determine compatibility of stimulation chemicals with well materials, reservoir rock, and fluids.

2. Develop stimulation plan based on the injection impairment cause

3. Provide work procedure and stimulation program to the UIC Program Director in writing at least 30-days prior to the planned date for start of the work (40 CFR 146.91(d)(2)).

4. Prepare wellsite and mobilize equipment

5. Shut-in and isolate the well from the CO2 injection system. Allow the pressures to stabilize

8. Rig up the stimulation equipment.

9. Prepare the well for stimulation.

10. Perform the stimulation treatment as per approved plan.

11. Flush the wellbore with treated water and prepare the well to return to normal operation

12. Rig down and return the well back to injection

4.5.5 CO2 Stream Characteristics

The CO2 stream chemical composition is described in Table 4-10. No solids are expected to be present in the CO2 stream and the composition is >97 mole percent CO2.

In general, unanticipated interactions among the CO2 injectate and the reservoir fluids are not expected that would act to reduce the permeability, porosity, or injectivity of CO2 into the injection intervals over the life of Project. Specific mineralogy and fluid testing were performed on core and fluid samples taken from the stratigraphic well to confirm these conditions prior to issuance of the Class VI permits. This included an assessment of the potential for mineral dissolution or precipitation within the Fleming and Upper Frio injection intervals that could potentially endanger USDWs. As outlined in this section, the current engineering design basis includes corrosion resistant well completion materials selected to provide a high degree of mechanical integrity under future conditions for the formation fluids and CO2 plume. See Section 6.2.5 for a summary of the proposed CO2 compatible cement.

Section 5 – Testing and Monitoring Plan provides a description of the analyses of the CO2 stream for the Project, including tests for potential impurities that may be present and whether such impurities might alter the corrosivity of the injectate downhole. The information provided in Section 5 was based on the expected chemical and physical characteristics of the CO2 stream and will be used to refine the well operating parameters while maintaining compliance with the Class VI permits.

A sample of the CO2 stream will be collected and analyzed for the suite of parameters listed in Table 5-3 prior to commencing injection and throughout injection operations at the proposed frequency. The details of the sampling process and frequency are described in Section 5 for approval by the UIC Program Director.

4.6 Operational Reporting Plan

During the operational phase of the Project, ExxonMobil will report, within 24 hours, a confirmed endangerment to USDWs to the UIC Program Director pursuant to the requirement in 40 CFR 146.88(f)(3); 146.91(c); and 146.94(b)(3), including:

- Evidence that the CO2 plume or pressure front may endanger a USDW or USDWs;
- The non-compliance situation as it relates to a permit condition;
- Apparent malfunction of the injection system;
- Triggering of a shut-off system or a loss of mechanical integrity; or
- A release of CO2 to the atmosphere or biosphere.

ExxonMobil will cease injection and take all steps reasonably necessary to determine whether there may have been a release of CO2 to an unauthorized zone in the event that there is a loss of mechanical integrity.

4.7 Injection Well Construction and Operation Summary

The geologic setting for this Project is ideally situated for carbon sequestration because of the geologic properties of the injection and confining zones and the compatibility of the reservoir fluids with CO2. The Project brings together the proven engineering practices of ExxonMobil in the design of the wells with a state-of-the-art monitoring system and a robust reservoir management strategy. The well designs are engineered to address the potential risks associated with the installation and operation of Class VI injection wells with a primary objective of protecting USDW from the threat of endangerment. The engineering design of the casing setting points, materials, and cement meet and exceed the requirements for Class VI injection well and for the conditions that have been projected for the Project. In addition, the operating strategy is designed to manage the pressure effects of CO2 injection in the injection zones, to use the available pore space to the fullest extent, and to mitigate potential issues through a robust operational and testing and monitoring strategy.

Underground Injection Control – Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

SECTION 5 – TESTING AND MONITORING PLAN

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage LLC

May 2025

SECTION 5 – TESTING AND MONITORING PLAN

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5.0 Testing and Monitoring Plan

Consistent with the requirements of 40 Code of Federal Regulations (CFR) 146.90, ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) developed a comprehensive Testing and Monitoring Plan (Plan) for the Rose Carbon Capture and Storage (CCS) Project (Project) using a risk-based approach. The data collection included injectate monitoring, corrosion monitoring of the well tubular, mechanical, and cement components; pressure fall-off testing; seismic surveying; well logging; continuous monitoring of injection rate and pressure; groundwater quality monitoring; carbon dioxide (CO2) plume and pressure front tracking. The data generated from implementation of the Plan provides the basis to verify the confinement of the injectate in the permitted injection formations during the active injection phase of the Project. The post-injection phase of monitoring is provided in Section 7 – Post-Injection Site Care (PISC) and Site Closure Plan consistent with the structure of the Underground Injection Control (UIC) Class VI Permit Application for the Project. In conjunction with careful site selection and Area of Review (AoR) delineation, this Plan will be a critical component of the successful operation, PISC, and eventual closure of the Project.

A key feature of the Testing and Monitoring Plan is the alignment between the injection operation plan and the geological site features that determine CO2 plume and pressure front migration. This Plan puts forth a data collection plan to confirm that the injection is consistent with the permit requirements. The Testing and Monitoring Plan also includes a phased/triggered approach for the incremental implementation of testing and monitoring technology, consistent with U.S. Environmental Protection Agency's (EPA's) presentation of phased/triggered monitoring in the *Underground Injection Control (UIC) Program Class VI Well Testing and Monitoring Guidance*, EPA 816-R-13-001 (Mar. 2013) (available at https://www.epa.gov/sites/default/files/2015-07/documents/epa816r13001.pdf). Overall, the risk of underground source of drinking water (USDW) endangerment is mitigated by balancing the increases in CO2 plume and pressure front size with the collection and analysis of data to track migration and assess the potential for leaks through the upper composite confining zone (UCCZ) throughout the life of the project.

ExxonMobil intends for the review process for the Plan and subsequent iterations to continue throughout the life of the Project. An adaptive monitoring approach will be employed whereby monitoring frequency of indirect monitoring technologies listed in Table 5.1 may be decreased based on positive test results. Amendments to the Testing and Monitoring plan will be submitted to the UIC Program Director for approval, incorporated into the permit, and subject to permit modification requirements. Monitoring results will be presented in semiannual reports, wherein data will be evaluated, and any monitoring frequency modification would be justified. Baseline data has been collected and comparisons to the baseline data will be made during the operational period of the Project. The adaptive approach will be applied if the data collected during the injection period shows results within the expected range. An ongoing dialogue between ExxonMobil and the UIC Program Director is envisioned, marked by tying the Plan reviews to the AoR reevaluation frequency in adherence to reporting requirements specified in 40 CFR 146.91 . Consistent with the discussion of AoR reevaluation in Section 3 – Area of Review and Corrective Action Plan, a defined schedule is proposed to address situations where there is a change in the AoR or if other circumstances change, while affording an efficient review process if the AoR reevaluation confirms that the Plan is appropriate as written. In this way, testing and monitoring results that indicate corrective action are required to trigger the mitigation measures identified in the AoR reevaluation (Section 3), and the Emergency and Remedial Response Plan (Section 8), if needed, will be triggered at the appropriate time.

5.1 Objectives

The following objectives were developed for the Testing and Monitoring Plan in alignment with 40 CFR 146.90:

- Use site characterization data, the site geologic conceptual model, and the results of computational modeling to identify areas or issues of potential concern for the Project;
- Consider how possible leakage pathways and uncertainties in confining zone and injection zone properties could affect the AoR boundaries and include this uncertainty in the testing and monitoring strategy;
- Select testing and monitoring strategies and technologies that are tailored to the site-specific risk profile in conformance with the requirements; and
- Identify Project-specific factors to consider or incorporate in evaluating the data collected from the Testing and Monitoring Plan, which may indicate the potential risk to or endangerment of USDW, as well as deviations from permitted conditions.

5.2 Overall Strategy and Approach for Testing and Monitoring Plan

The Class VI Rule requires various testing and monitoring activities to identify potential risks to, and the potential for endangerment of, USDWs. ExxonMobil consulted with the EPA, Region VI UIC Program Director, and the Railroad Commission of Texas (RRC) in pre-application discussions to identify the testing and monitoring activities that were best suited for the Project. The site features that affect the degree of risk and potential for endangerment of a USDW include:

- The integrity of the UCCZ to contain the CO2 plume and pressure front;
- The potential for vertical migration of CO2 and/or brine along faults;
- The occurrence of legacy well penetrations (or “artificial penetrations”) through the UCCZ;
- The potential geomechanical stress induced by the modeled injection pressure;
- The engineering design considerations for wellbore cement, casing/tubing materials of construction and completion; and
- Conformance to the modeled operational targets.

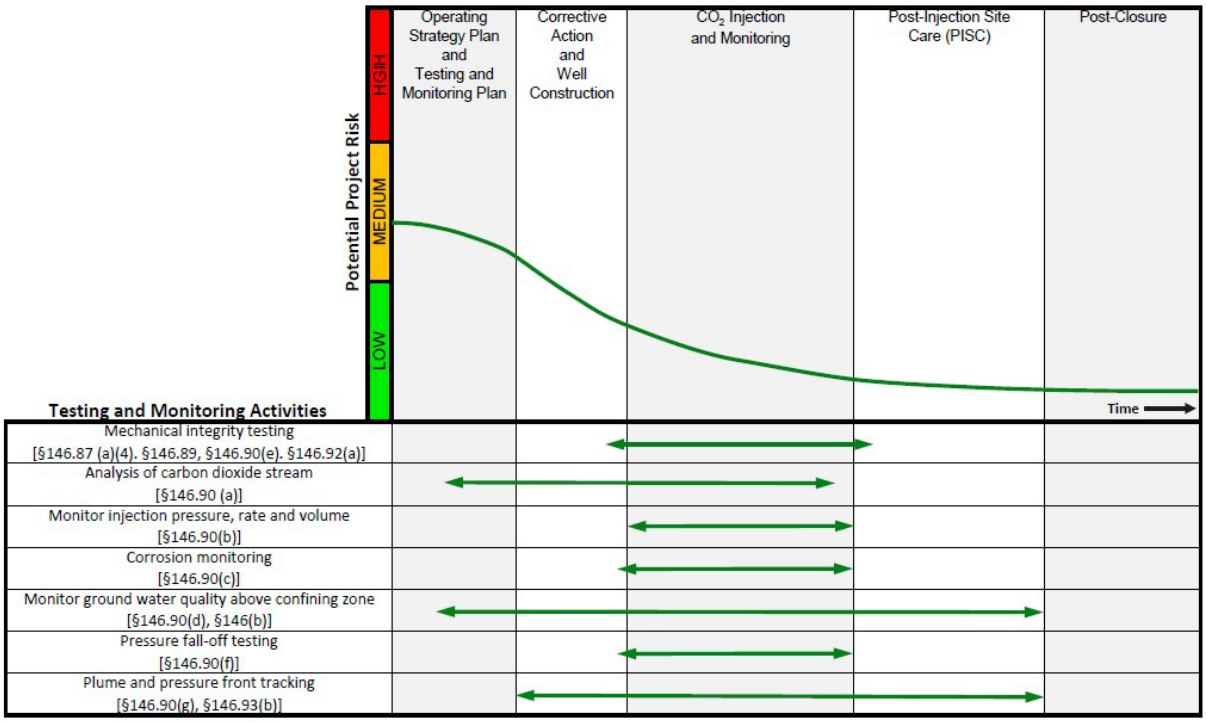
Of these features, the key risk factor that is most critical for the design of this Plan is the potential for legacy well penetrations to create leakage pathways through the UCCZ. ExxonMobil completed a variety of technical tasks discussed in Section 3 ─ Area of Review and Corrective Action Plan, to identify and evaluate the potential for legacy wells to exist in circumstances where CO2/brine could potentially leak up through a partially plugged wellbore (e.g., with open borehole) or one that is inadequately plugged for CO2 sequestration sites. Other potential risks associated with the Project were deemed to be of a lower probability and consequence.

Therefore, a focused testing and monitoring approach was considered reasonable and appropriate to address the following risk scenarios:

- Migration of CO2/brine along a fault/fault material or natural fracture impacting USDW;
- Migration of CO2/brine along a fault/fault material or natural fracture impacting USDW due to fault reactivation;

- CO2/brine leaks up unknown wellbore or one inadequately remediated;
- Induced seismicity;
- Loss of external mechanical integrity, which leads to a release of CO2 from injection wells;
- CO2/brine leaks through seal(s) due to lack of seal continuity/presence;
- Unanticipated structural or stratigraphic baffling creates preferential CO2 plume migration pathways; and
- CO2 composition changes and creates excess injection corrosion or unexpected chemical reactions in the injection zone.

Figure 5-1: Summary of the Risk Assessment Process for the Lifecycle of the Project



As shown in Figure 5-1, the anticipated risk level is medium at the pre-operational phase of the Project and is associated with the site characterization and AoR evaluation findings, before implementation of mitigation measures including injection well placement, injection interval selection, operational limitations, and corrective action for artificial penetrations. The injection well locations and injection intervals were selected to provide separation from geologic features (e.g., faults) that could potentially contribute to CO2 or brine crossflow between the injection zone and USDW. Except during stimulation, the maximum injection pressure will be maintained below 90 percent of the fracture pressure of the injection zone(s) to prevent the initiation of new fractures or propagation of existing fractures per the requirements of 40 CFR 146.88(a). Construction and mechanical integrity testing will be employed to reduce the potential for the loss of external mechanical integrity, which could potentially release CO2. The composition of the injectate stream will be managed and monitored such that unexpected reactions with the potential to impact containment are mitigated. Monitoring and predictive reservoir modeling are

being used to limit the potential for CO2 plume and pressure front migration to encounter artificial penetrations that have the potential for CO2 or brine crossflow from the injection intervals to the lowermost USDW.

The accompanying Class VI Rule testing and monitoring requirements address the potential risk scenarios identified by ExxonMobil as warranting monitoring and testing. Scenarios that were found to have elevated risk will be the subject of corrective action prior to operations. Two artificial penetrations (Bead Farm Co. #1 and Broussard J E Jr-1) are located within or near the five-year CO2 plume and pressure front as shown on Figure 3-25. Corrective action has been performed on these wells and the local areas will be monitored as part of the overall monitoring program described in this section. No additional artificial penetrations that penetrate the UCCZ are located within or near the CO2 plume and pressure front. Therefore, a phased corrective action plan is not warranted.

An array of data collection technologies was screened to identify the most reasonable and appropriate methods for the Testing and Monitoring Plan. The screening criteria include: (1) selection of appropriate direct and indirect mature monitoring technologies; (2) cost benefit analysis of each technology to mitigate potential; and (3) a mix between continuous and periodic implementation schedule. ExxonMobil recognizes mature technologies based on their Technology Readiness Levels (TRL), as defined by the International Energy Agency in their report *Energy Technology Perspectives, 2020; Special Report on Carbon Capture Utilisation and Storage.* This scheme is applicable to any technology, including those described in Table 5-1 for implementation on the Project. As described on Figure 5-2, mature technologies are those with TRL 8 (first-of-a-kind commercial demonstration with full-scale deployment in final form) and higher.

The monitoring methods are designed to track the plume in each of the four injection intervals from bottom to top: Upper Frio Sands, Fleming Sands 3, 2, and 1 provided in Figure 5-3.

Figure 5-2: TRLs for Selection of Monitoring Technologies

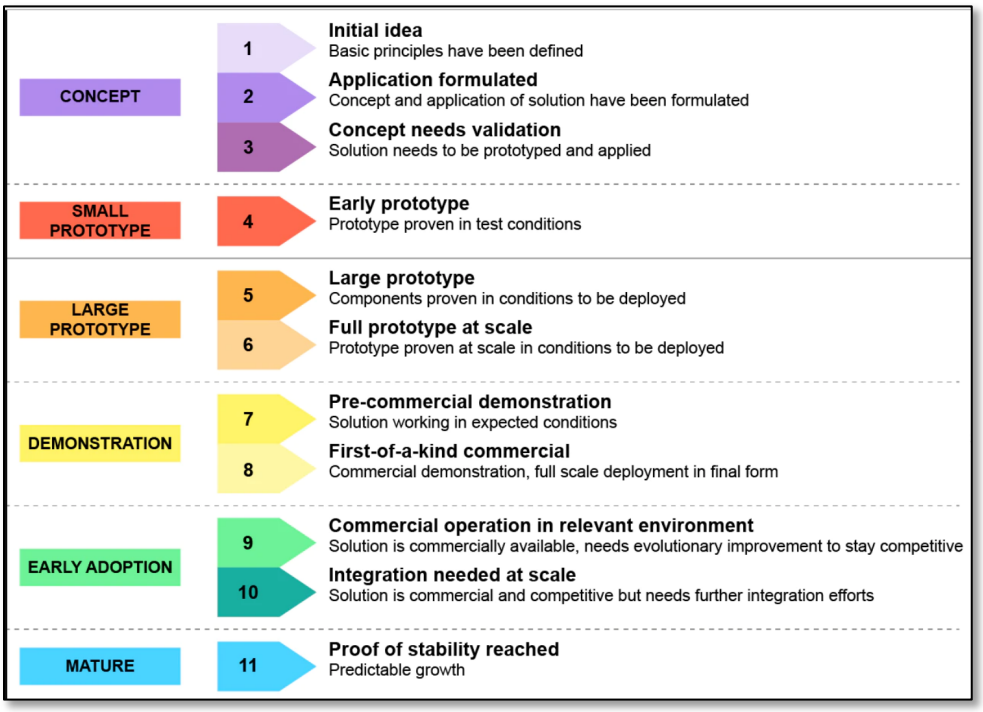


Table 5-1 provides a summary of mature technologies selected for tracking the CO2 plume and pressure front. Consistent with the stated interests of the EPA, the Testing and Monitoring Plan is intended to be a flexible approach using appropriate technologies and techniques that are refined and adapted based on site-specific information over time. ExxonMobil will continue to assess the feasibility of emerging technologies and conduct performance evaluations to continue to improve the performance of the testing and monitoring system.

Amendments to the Testing and Monitoring plan will be submitted to the UIC Program Director for approval, incorporated into the permit, and subject to permit modification requirements. Through the combination of proven and emerging technology pilot testing, a cost-effective testing and monitoring strategy will be maintained for the Project that measures the CO2 plume and pressure front migration paths and serves to provide reliable data for reevaluating the AoR model.

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Table 5-1: Summary of Monitoring Technologies for Direct and Indirect CO2 Plume and Pressure Front Tracking

Target Zone	Requirement	Technology	Placement Location	Target Depths	Phased/Triggered Approach	Monitoring Frequency	Data Evaluation Objectives
Injection Zone	Direct per 40 CFR 146.90(g)(1)	Downhole tubing mounted pressure and temperature gauge	Injection Wells No. 01, No. 02, and No. 03	Four injection intervals in Fleming and Upper Frio Formations	No	Continuous monitoring during injection operations for each injection interval Annual pressure fall-off test during well shut-ins	Identify pressure differential and location of pressure front for the four injection intervals
		Tubing encapsulated conductor cable with in-line pressure/ temperature gauges	In-Zone Monitoring Well No. 01	Four injection intervals in Fleming and Upper Frio Formations	No	Continuous monitoring	CO2 plume and pressure front tracking
	Indirect, geophysical techniques per 40 CFR 146.90(g)(2)	Time-lapse seismic surveys, or equivalent technologies	CO2 Plume Area	Four injection intervals in the Upper Frio and Fleming Formations	No	Surface Seismic Survey Event #1 (Survey Event #1) is the baseline event conducted prior to injection. Survey Event #2 will be performed within the first three years after injection, Survey Event #3 within six to eight years after injection, Survey Event #4 in year 13 at cessation of injection. Additional survey events if necessary, during PISC, as approved by UIC Program Director.	Monitor CO2 plume growth in the subsurface over time
		Passive Seismicity Monitor Station Array	Selected locations within AoR	Surface	Yes, contingent on triggering seismic event above threshold level determined by Table 8-3: Response Actions for Seismic Events.	Continuous monitoring	AoR-specific seismicity data collection and event analyses
Above UCCZ	Direct per 40 CFR 146.90(g)(1)	Fluid sampling protocol using converted Bead Farm Co. #1 collected through tubing	Above-Zone Monitoring Well - Bead Farm Co. #1	First laterally continuous water-bearing zone above UCCZ	No	Quarterly samples	Detection monitoring for CO2 plume and/or brine crossflow from injection zones to top of UCCZ
	Indirect, geophysical techniques per 40 CFR 146.90(g)(2)	Time-lapse seismic surveys, or equivalent technologies	CO2 Plume Area	From surface to base of Frio Sand 2	No.	Surface Seismic Survey Event #1 (Survey Event #1) is the baseline event conducted prior to injection. Survey Event #2 will be performed within the first three years after injection, Survey Event #3 within six to eight years of injection, Survey Event #4 in year 13 at cessation of injection. Additional survey events if necessary during PISC, as approved by UIC Program Director.	Detection monitoring for presence of CO2 plume above UCCZ Detection monitoring and evaluation of trends in water quality and geotechnical parameters

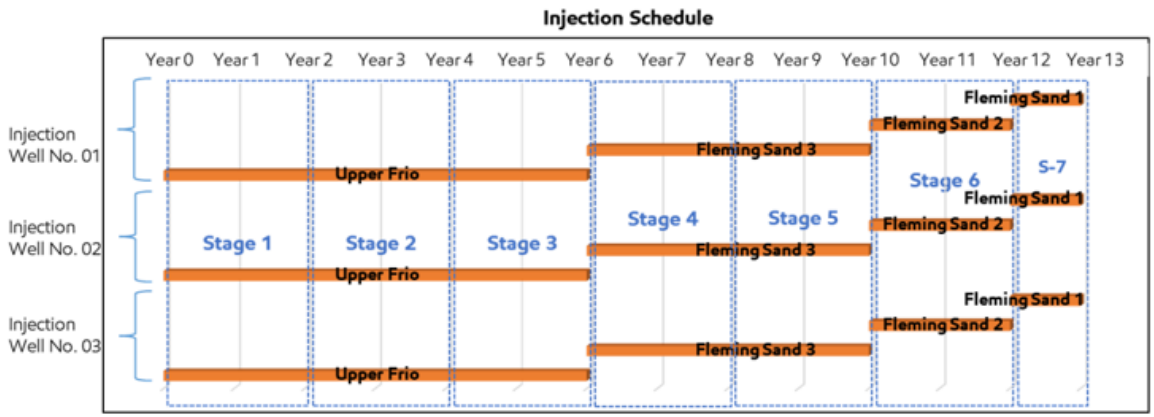
Target Zone	Requirement	Technology	Placement Location	Target Depths	Phased/Triggered Approach	Monitoring Frequency	Data Evaluation Objectives
USDW	Direct per 40 CFR 146.90(d)	Fluid Sampling	USDW Monitoring Wells No. 01, No. 02, No. 03	Groundwater samples collected just below the typical total depth of water wells completed in the area (e.g., 300 to 350 ft BGL).	Yes, three USDW monitoring wells prior to start of injection and additional USDW monitoring wells depending on the results of CO2 plume and pressure front tracking as discussed in AoR reevaluations	Pre-Operational Phase – Quarterly Operational Phase – Quarterly	Detection monitoring and evaluation of trends in water quality and geotechnical parameters
Soil Gas Monitoring	Direct per 40 CFR 146.90(h)	Soil gas samples collected from the unsaturated zone	Contingent on confirmed release to USDW				
Air Monitoring	Direct per 40 CFR 146.90(h)	Portable and/or stationary CO2 detectors monitor record ambient CO2 concentrations	Contingent on confirmed release to USDW				

5.3 Use of Phased and/or Triggered Approach

The testing and monitoring plan for CO2 plume and brine pressure front tracking makes use of the phased and/or triggered approach to scale the testing and monitoring network with the extent of the AoR and the site features that warrant monitoring. The goal of the approach is to provide the data necessary to demonstrate that USDWs are protected from the potential leakage of CO2 or brine. The scaling aspect of the strategy is aligned with the staged-injection approach outline in Section 3 – Area of Review and Corrective Action Plan that makes use of the vertical profile of the injection zone to optimize the CO2 storage volume and provides less CO2 plume and pressure front expansion from year-to-year than would otherwise occur with a more concentrated injection approach. The initial monitoring network is based on the model-predicted five-year AoR and what was deemed appropriate to track the CO2 plume and brine pressure front during that time period. From that point, the AoR reevaluation process will be used to assess the adequacy of the testing and monitoring program to detect potential leakage should it occur and make recommendations for changes if necessary to demonstrate protection of USDWs.

Figure 5-3 provides an illustration of the staged-injection approach for the Project. CO2 will be injected at separate stages into four injection intervals in the Fleming and Upper Frio sands, thousands of feet below the lowermost USDW. Rose CCS Project Injection Wells No. 01, No. 02, and No. 03 start injection in the Upper Frio formation and then move to the Fleming formation. Two confining zones are present including the Anahuac Shale and the UCCZ. Additional intraformational shale layers are present within the Fleming and Upper Frio formations. Section 3 ─ Area of Review and Corrective Action Plan provides a detailed discussion of the injection rates and schedules for each injection well and injection interval.

Figure 5-3: Staged-Injection Approach to Optimize CO2 Storage



Injection Stage Configuration

Stage 7

Stage 6

Stage 5

Stage 4

Stage 3

Stage 2

Stage 1

Claimed as PBI

As the CO2 plume and pressure front expand over time, so does the deployment of technology to gather data and assess the potential for USDW endangerment. This phased and/or triggered monitoring strategy was adopted for the Plan based on the timing and depth of each injection interval described in Figure 5-3. The phased and triggered approach was identified as being protective of the USDW because of the availability of mature, reliable, and accurate technologies for tracking the CO2 plume and pressure front within the injection zones while reducing the number of well penetrations through the UCCZ.

The monitoring program was also constructed to align with the three operational phases of the Project: (1) pre-operational baseline data collection phase (cross-referenced in Section 4 ─ Engineering Design and Operating Strategy); (2) the operational phase for the three injections discussed in this section; and (3) the PISC phase (discussed in Section 7 ─ Post-Injection Site Care and Site Closure Plan). During the pre- and early-operational phases, a selection of technologies will be used to establish baseline seismic, pressure and certain geochemical parameters needed to monitor the CO2 plume and pressure front. This information will also be used to confirm the predictive modeling results and refine the model as necessary. During the operational phase, the frequency of direct monitoring data collection activities will be aligned with the initiation of injection into each new stage of the injection interval as described in Figure 5-3. The accuracy of the model at predicting the CO2 plume and pressure front migration will inform the frequency of indirect monitoring data collection. Upon confirmation of the predictive capabilities of the model, the frequency of indirect monitoring activities listed in Table 5.1 may be reduced as justified by the rates of change and variations observed by the monitoring results, which are subject to approval by the Director and incorporation into the permit.

A key consideration for the placement of In-Zone Monitoring Well No. 01 and Above-Zone Monitoring Well No. 01 was the need to collect high-quality data that represent the location of the CO2 plume and pressure front for assessing USDW endangerment. The locations of In-Zone Monitoring Well No. 01 and Above-Zone Monitoring Well No. 01 provide useful data relative to the injection permit requirements. A semiannual report will be provided to EPA that presents the collected monitoring data and plume migration evaluations. Surface air and soil gas monitoring [40 CFR 146.90(h)] are proposed as a triggered monitoring condition. The additional use of these technologies will be based on monitoring results obtained from the above UCCZ groundwater and USDW monitoring events.

5.4 Mechanical Integrity Test Methods

5.4.1 Internal Mechanical Integrity Testing – Annulus Pressure Test

In accordance with 40 CFR 146.89(b), ExxonMobil assessed the internal mechanical integrity of each injection well by performing annulus pressure tests after the well was completed, will assess again prior to injection, and annually thereafter. Annular pressure testing verifies the Part I or internal integrity of the annulus between casing and tubing above the packer. During well construction, prior to the installation of the injection tubing and packer, the casing was also pressure tested to the maximum anticipated annulus-surface pressure to verify its integrity. Additionally, during well construction and prior to installation of the injection tubing and packer, a casing inspection log was run to confirm the casing integrity.

The annular pressure tests are designed to demonstrate mechanical integrity of the casing, tubing, and packer. These tests will be conducted by pressuring the annulus to a minimum of the planned surface injection pressure described in Section 4 – Well Construction Plan and Operating Conditions.

The injection tubing annulus pressure will be continuously monitored at the wellhead during all other times. As required by 40 CFR 146.91(e), the tubing annulus pressure will be recorded and

reported to the UIC Program Director and additional appropriate regulatory permitting authorities, as needed, in semiannual reports to demonstrate compliance with casing integrity requirements.

An annular pressure test was conducted to confirm the integrity of the casing, tubing, and packer as per the following procedure:

- Ensure tubing/casing annulus is filled with fluid;
- Ensure temperature stabilization of well by ceasing injection before and through the test;
- Isolate the annulus pressure system;
- Rig up test pumps onto wellhead, A-Annulus outlet valve and pressure test surface lines to a minimum of planned testing pressure;
- Open casing valve outlet and increase the pressure to a minimum of the planned surface injection pressure as described in Section 4- Well Construction Plan and Operating Conditions.;
- Hold pressure for 30 minutes while charting test and continuously monitoring pressure ;
- Upon completion of 30-minute interval, check results of tests to confirm that the test has not lost more than 3% of test pressure; and
- Bleed off pressure and report results to UIC.

5.4.2 External Mechanical Integrity Testing

Following the requirements of 40 CFR 146.89(c), ExxonMobil will perform an annual Part 2 external mechanical integrity test (MIT) using both wireline temperature surveys and distributed temperature sensing (DTS) fiber. Wireline temperature surveys will be conducted as part of the regular MIT logging program and compared to DTS fiber measurements until sufficient data has been acquired and reviewed with the UIC Program Director to corroborate the use of DTS for leak detection. DTS fiber has advantages over traditional wireline tools since it is deployed permanently down hole, records at higher resolution, and can be recorded at any time utilizing the DTS interrogator at surface without the logistical challenges of wireline deployment. One of the benefits of this approach is that measurements can be obtained continuously while the well is operating or shut-in.

One fiber optic cable was installed in each injection well for DTS measurements to be collected across the formation intervals of interest. The cable was cemented behind the casing. A DTS interrogator will be available on demand to record temperature data from this fiber optic cable.

If temperature anomalies are observed outside of the permitted zone, ExxonMobil will deploy a Pulse Neutron Logging (PNL) tool in oxygen activation (OA) mode across the anomalous interval to quantify any potential leak rate. The UIC Program Director will be notified of the planned procedure a minimum of 30 days in advance of field activities, per 146.91(d)(3). The actual procedures will be proposed during the notice to the Director, and may vary depending on site, vendor, and equipment factors.

A Pulse Neutron tool is used for the purpose of detecting and quantifying the flow of water in or around the well. A Pulse Neutron test is considered passing when no upward-flow is detected outside of the injection zone.

Threshold velocities for false positives will be determined based on the vendor's logging equipment.

5.4.3 Reporting Results of MIT

Annulus pressure test results will be submitted to the UIC Program Director and additional appropriate regulatory permitting authorities, as needed, within 30 days of completion. The logs recorded during external MIT will be submitted to the appropriate regulatory permitting authority such as the UIC Program Director within 30 days of the verification that the logging results are representative and acceptable.

5.5 Continuous Recording of Operational Parameters During Injection

ExxonMobil installed and will use continuous measurement devices to monitor injection pressure, rate, and mass injected; the pressure on the annulus between the tubing and the long-string casing; and the temperature of the CO2 stream, as required under [40 CFR 146.88(e)(1), 146.89(b), and 146.90(b)]. Data will also be collected to document the addition or removal of any fluid from the annulus system. Data interfaces will be created for equipment that is not linked directly to a data management system or suitable equivalent, and it will be integrated into a unique surveillance platform. In the monitoring program, the sensors, transducers, and controllers will be connected in a central platform to monitor the operating conditions, set alarms for alerting operations of malfunction, and establish safety protocols in case of abnormal conditions. Alarms will additionally be set for pressures outside described tolerances (generally 90% of fracture gradient and prescribed wellhead pressures), and changes in annular pressure and fluid.

Instrument calibration standards, precision, and tolerances will be determined based on manufacturer recommendations. The automated control system data will be visually monitored for anomalies on a regular basis. Average values will be compared to baseline and predicted values to determine if there are any significant deviations relevant to integrity or containment.

The operating parameters, monitoring values, laboratory results, reports, and surveillance documents for the Project will be stored in a database to support AoR reviews, quality assurance / quality control review programs, and routine reporting. Table 5-2 provides a summary of the typical sampling devices, locations, and data storage frequencies for the continuous monitoring program. Records will be submitted in an electronic format, per 40 CFR 146.91(e).

Table 5-2: Sampling Devices, Locations, and Data Frequencies for Continuous Monitoring

Parameter	Device(s)	Location	Estimated Min. Sampling Frequency	Estimated Min. Recording Frequency
Surface Injection Pressure	Wellhead Pressure Logger	Surface, injection well piping	5 seconds	5 minutes
Downhole pressure gauge	Pressure Gauges	Injection Unit	5 seconds	5 minutes
Injection rate	Coriolis Meter	Central Pad piping	5 seconds	5 minutes
Injectate density	Coriolis Meter	Central Pad piping	5 seconds	5 minutes
Total mass injected	Coriolis Meter	Central Pad piping	5 seconds	5 minutes
Annular pressure	Pressure Gauge	Well Head	5 seconds	5 minutes
Annulus fluid volume	Pressure Gauge	Annulus System Tank	5 seconds	5 minutes

Parameter	Device(s)	Location	Estimated Min. Sampling Frequency	Estimated Min. Recording Frequency
CO2 stream temperature	Coriolis Meter/Wellhead Pressure Logger	Well Head, injection well flowing	5 seconds	5 minutes
Note: The word “continuous” is used to express the frequency of measures collected during monitoring equipment operation is defined as the instrument’s normal data collection frequency as defined by the manufacturing. The frequency will vary by instrument and application. Measurements that are collected “continuously” will be averaged across a reasonable and appropriate time interval for reporting the detection monitoring results during the operational phase of the Project.				

5.5.1 Continuous Monitoring of Injection Rate and Volume

ExxonMobil will collect continuous measurements necessary to calculate and report the injection mass flow rate and volume in compliance with 40 CFR 146.90(b). A data management system or suitable equivalent will be used to facilitate continuous collection of intake pressure at the central pad transfer point, pressure within the distribution system to each injection well, and the wellhead of the injection wells.

A Coriolis flow meter will be used to measure the flow rate at the central pad and compute flow rates for each injection well. The Coriolis flow meter directly measures the mass flow rate of the injected fluid. Analytical methods will be conducted at a periodic interval to determine the mass percentage concentration of CO2 and carbon monoxide (CO). The mass percentage concentration of CO2 and CO are multiplied by the total mass flow reading from the Coriolis flow meter to estimate the total mass of captured CO2 and CO for a given period. The meter will be placed directly at the point of injection. The meter will be calibrated to manufacturer specifications.

ExxonMobil will review and interpret the continuously monitored parameters to validate that they are within permitted limits. The data review will also include examination of trends to help assess the need for equipment maintenance or calibration. Semiannual reports of the monitoring data will be submitted to the regulatory permitting authority.

5.5.2 Continuous Monitoring of Injection Temperature and Pressure at Injection Well]

ExxonMobil will perform continuous monitoring of the injection pressure, temperature, mass flow rate, and injection annulus pressure in compliance with 40 CFR 146.90(b). The injected CO2 stream pressure will be continuously monitored in the CO2 flowline near the wellhead interface. The annulus pressure will also be continuously recorded. The combined wellhead and downhole monitoring data will be used to continuously characterize the injection stream in detail.

ExxonMobil will review and interpret the monitoring data to confirm compliance with the operational limits of the injection permit for each well. The data review will include an analysis of trends for operational performance evaluation and routine maintenance. Periodic reports of the monitoring data will be submitted to the UIC Program Director.

5.5.3 Continuous Monitoring of Injection Temperature and Pressure in Reservoir

Reservoir temperatures and pressures will be measured using a downhole gauge installed in the tubing above the production packer. The gauge is shown in detail in Section 4 ─ Well Construction Plan and Operating Conditions. For specialized data such DTS, the Project will use additional support from the provider of the selected technologies to perform quality control and verification of the data as well as calibration of the systems as needed. See Section 4 for

well diagram(s). The Wellhead Pressure Logger will also continuously measure the temperature and can be used as a backup in case the DTS fails.

5.5.4 Continuous Monitoring of Annular Pressure and Volume (Tank Level)

The annular pressure between the tubing and the injection casing string will be monitored on a continuous basis. The pressure gauge on the annulus will be tied into the data management system or a suitable equivalent system and set to alarm if pressure or volumes move outside set tolerances. The annulus tanks in the well systems will be maintained with sufficient volumetric capacity to accommodate the anticipated volume fluctuations due to temperature and pressure variations. The annulus tanks are to be equipped with a level transducer or an armored reflex sight glass and an independent liquid fill nozzle. If any annulus fluid is added or removed, it will be recorded. An annulus tank level is to be recorded on any day when injection occurs.

5.5.5 Positive Annular Pressure

Per 40 CFR 146.88(c), pressure will be maintained in the annulus at a value of at least 100 psi greater than the injection pressure. ExxonMobil will fill the annulus with a non-corrosive fluid approved by the UIC Program Director. A system will be set up to maintain pressure in the annulus using non-corrosive fluid or gas and it will be tied into the alarms or a suitable equivalent system designed to signal pressure drops below set-points.

5.6 Corrosion Monitoring

The tubing and casing materials will be monitored during the operational period for loss of mass, thickness, cracking, pitting, and other signs of corrosion to demonstrate that the well components continue to meet the minimum standards for material strength and performance. Monitoring will take place based on well-specific conditions that are encountered, with corrosion coupons tested on a quarterly basis.

5.6.1 Monitoring Location and Frequency

Corrosion coupons are placed in continuous contact with the CO2 stream. Corrosion coupons are installed downstream of the central pad facility meter run on the 12-inch header and upstream of the check valves prior to the flow lines to the injection wells. The samples will be exposed to the process stream conditions immediately prior to injection using a recycle loop or sample retriever. Exposure is to be representative of conditions at the top of the tubing. Coupons will be tested quarterly.

Casing inspection logs (CILs) (e.g., ultrasonic imaging tool, electromagnetic, cement bond log, and caliper) will be conducted on the long-string casing at a minimum frequency of once every five years. When the operational monitoring of the plume and/or pressure indicate that a completion stage has been fully utilized and it is time to recomplete uphole to a shallower injection interval, the tubing will be removed and inspected, and a casing inspection logging suite will be run. If the abandonment of an interval is not warranted at the time of recompletion, then a thru-tubing casing inspection will be performed.

5.6.2 Monitoring of Corrosion Coupon

Monitoring of well tubing and casing material corrosion willbe conducted on a quarterly basis to evaluate the corrosion coupon monitoring system. A corrosion coupon station or rack will be provided as part of well-materials integrity monitoring. Any coupon in active use will be exposed to the stream composition to provide ongoing evaluation of material compatibility with the CO2 stream. The results will be reported to the regulatory permitting authority such as the EPA UIC Director semiannually.

The coupons will be assessed for corrosion using American Society for Testing and Materials (ASTM) and Association for Materials Protection and Performance (AMPP) standards. AMPP NACE SP0775-2023 will be followed to assess coupon weight loss and pitting analysis (after baseline). When the coupons are removed, they will be inspected visually for signs of corrosion or pitting. The weight and size of the coupons will be measured each time they are removed. The rate of corrosion will be calculated using a weight loss method where the rate equals the weight loss during the exposure period divided by the duration of the period.

The coupon initial baseline measurements will follow the recommendations of ASTM G1-03 (included in references). Coupons will be prepared from the material used to construct the injection well. A method of coupon preparation will be chosen that does not alter the properties of the metal. For example, grinding operations will be controlled to avoid high surface tensions/temperatures that could change the microstructure of the coupon. Coupons may be prepared by smooth grinding with 120 grit paper, by tumbling with loose grit, or blasting with abrasive blasting material. A consistent finish may be obtained by blasting with glass beads. The abrasives will be free of metallic particles. A permanent serial number shall be etched or stamped on each coupon. ExxonMobil will machine or polish the edges of the coupon to remove cold-worked metal if the cold-worked edges adversely affect the data. ExxonMobil will dry, measure length, measure width, measure thickness, and weigh the coupons to within ± 0.5 mg, record the mass, serial number, and exposed dimensions, calculate the surface area (including the edges) and record. The areas covered by the coupon holder and shielded areas of flush-mounted coupons will be excluded.

5.6.3 Cement Evaluation and Casing Inspection Logs

As discussed in Section 4 ─ Well Construction Plan and Operating Conditions, a cement bond log was run after the casing was run and cemented and sufficient cement-curing has taken place. Logging was conducted to assess the quality of the cement. A baseline CIL log established the initial dimensions of the wall thickness of the production casing after it was cemented. Following the installation of the completion equipment, including the tubing and packer assembly, an initial electromagnetic through-tubing CIL was run. The CIL will serve as the baseline survey for potential future repeat surveys with the objective of enabling the detection of possible loss of metal mass.

Repeat electromagnetic CILs will only be performed if other monitoring measurements create concern about the integrity of the casing of the well, and the technical determination is made that a repeat CIL is most suitable to address those concerns. Examples include a loss of annulus pressure and temperature measurements using the fiber optic cables installed in the well. Changes in the recorded electromagnetic response will be analyzed to identify and localize casing corrosion, addressing 40 CFR 146.89(d).

5.7 Pressure Fall-Off Testing

Required pressure transient fall-off testing will be conducted at the end of every injection stage, prior to recompletion, or every five years, whichever is more frequent, to meet the requirements of 40 CFR 146.90(f). Pressure fall-off tests will be conducted at the staged-injection interval. Recompletion to shallower intervals will result in no further pressure fall-off testing for injection intervals in post-injection status. The objective of periodic testing is to monitor for any changes in the near-well bore environment that may impact permeability and reservoir pressures during active injection. A report containing the pressure fall-off data and interpretation of the reservoir pressure will be submitted to the EPA within 30 days of the conclusion of the test. Although test procedures or methods may be changed based on request of the permittee and approval by the

UIC Program Director, the following procedure is expected to be typical for such periodic monitoring.

5.7.1 Testing Method

The procedures to conduct a pressure fall-off test are as follows:

- Record data regarding test well injection at typical operating conditions (constant rate plus or minus 10%). Rate versus time data will be recorded during the injection period. Cumulative injection volume will also be recorded. Continue injection for a time equivalent to the projected duration of the fall-off necessary to observe analyzable radial flow. Note that significant rate variations may require more complicated analysis techniques.
- Verify operation of permanent monitoring equipment or rig-up downhole memory pressure gauge and run in well to a datum depth approved by the regulators.
- For pressure transient fall-off, obtain final stabilized injection rate and pressure for a minimum of 1 hour. Ensure that the injectate temperature has stabilized.
- Cease injection and monitor pressure fall-off. Continue monitoring pressure for a time sufficient to observe reservoir behavior. Wellbore pressure gradients will be obtained to establish fluid gradient.
- Stop test data acquisition, rig-down and release equipment.

5.7.2 Analytical Methods

Near-wellbore conditions, such as the prevailing flow regimes, well skin, reservoir properties and boundary conditions will be assessed through the use of standard pressure transient diagnostic plotting and well test simulators, as required. This assessment will be accomplished from analysis of observed pressure changes and pressure derivatives on standard diagnostic log-log and semi-log plots. Significant changes in the well or reservoir conditions will be identified by comparing pressure fall-off tests performed prior to initial injection with later tests. These well parameters resulting from fall-off testing will be compared against those used in AoR determination and site computational modeling. Notable changes in reservoir properties may dictate that an AoR reevaluation is necessary.

The pressure fall-off test results will be submitted to the UIC Director within 30 days of completion of the quality assurance / quality control verification of the pressure data.

5.7.2.1 Quality Assurance / Quality Control

The surface field equipment will undergo inspection and testing prior to operation. The pressure gauges will be calibrated prior to installation per manufacturer instructions. Documentation certifying proper calibration will also be enclosed with the test results. Further validation of the test results will be justified by extended collection of pressure data from the plugged and abandoned injection stages. The continuation of pressure monitoring in deeper, inactive stages allows for recording of the naturally occurring pressure decay. Pressure communication between stages may also be evaluated with this approach.

ExxonMobil developed the Quality Assurance Surveillance Plan (QASP) in Appendix E in this application as a supplement to the testing and monitoring requirements of this section as well as Section 4 – Well Construction Plan and Operating Conditions and Section 7 – Post-Inject Site Care and Site Closure Plan. The goal of the QASP is to provide reliable data to verify that the Project is operating as permitted without endangerment to USDWs. The QASP provides a verifiable set of standards and controls that include the technologies, methodologies,

frequencies, sample quality assurance, and procedures to demonstrate the collection data activities will provide accurate and reliable information about the Project operations. The QASP is unique to the Project, informed by site-specific details, monitoring technologies selected, and will be updated as the Project evolves in concert with the Testing and Monitoring Plan.

5.7.2.2 Monitoring of CO2 Stream

Consistent with 40 CFR 146.90(a), ExxonMobil will install and use measurement devices to analyze the chemical composition of the injection stream to assess the potential for interactions between CO2 and other injectate components and compatibility with the well completions materials. Temperature and pressure will also be measured at the sample collection point.

5.7.2.3 Sampling Frequency

CO2 stream will be sampled quarterly.

5.7.2.4 Sampling Methods

The quarterly measurements will be obtained by collecting representative samples of CO2 at a sample port on the Project's central pad beyond the last stage of compression in the compression build or similar point. Sufficient mixing and residence time in the system will have occurred at this sampling point for the sample to be representative of the injected CO2 stream. The sampling station will be equipped with the ability to purge and collect a gas sample into a sealed container. The central pad is the connection point between the CO2 pipeline and the sequestration field's distribution system.

Sampling activities will be conducted at the direction of site representatives and in accordance with the certified or accredited analytical laboratory procedures and will meet the minimum current standard EPA procedures. A sample will be collected by depressurizing the liquid stream and sampling the CO2 as a gas in either a Tedlar® bag, a Summa cannister, or laboratory-approved alternate. The grab sample will be sent to an independent contract laboratory for analysis.

Each sample will be accompanied by a facility or contract laboratory Chain-of-Custody (COC) form that provides a record of sample handling, starting with sample acquisition, documenting the sample transfer process up to laboratory analysis. Samples taken are to be logged in the field using the COC form. Sample transfer containers (e.g., coolers) will be sealed and delivered to the laboratory with a COC form. The COC form shall provide the following items recorded by the sampler:

1. Sample ID including code or name, in addition to date and time;
2. Name of sample collector; (include sampling company name if not site personnel);
3. Sample collection method;
4. Sample collection date;
5. Sample collection point; and
6. Sample presentation technique, as applicable.

Standard laboratory COC forms that document the times and dates of all personnel handling the sample, along with standard labels and container seals sufficient to distinguish between samples and prevent tampering, will be acceptable.

Sample COC will be followed at all times during the sampling and subsequent analysis. COC will be used to document the handling and control necessary to identify and trace a sample from collection to final analytical results.

5.7.3 Analytical Plan

Table 5-3 presents the test parameters, analytical methods, and sample frequency for each test parameter. The selected parameters and constituents for analysis are consistent with the composition of the CO2 stream described in Section 4 – Well Construction Plan and Operating Conditions.

Table 5-3: Summary of CO2 Sampling and Analysis Plan

Parameter/Constituents	Analytical Method(s)1	Frequency
CO2 Purity	ISBT 2.0, GC/DID or Method 3A	Quarterly
Water	ISBT 3.0, GC/FTIR, Method 320, EPA Method 4	Quarterly
Oxygen	ISBT 4.0, GC/DID or Method 3A	Quarterly
Nitrogen	ISBT 4.0, GC/DID or by difference	Quarterly
Sulfur Dioxide	ISBT 14.0, GC	Quarterly
Hydrogen Sulfide	ISBT 14.0, GC	Quarterly
Oxides of Nitrogen	ISBT 7.0	Quarterly
Total Hydrocarbons	ISBT 10.0, GC	Quarterly
Carbon Monoxide	ISBT 5.0, GC/DID	Quarterly
Methane	ISBT 10.1, GC	Quarterly

DID = discharge ionization detector; FTIR = Fourier transform infrared; GC = gas chromatography; ISBT = International Society of Beverage Technologists

[1] Or suitable alternate analytical method may be used.

5.8 CO2 Plume and Pressure Front Tracking

ExxonMobil plans a two-phased strategy for meeting the requirement for plume tracking consistent with 40 CFR 146.90(g). For the initial period of operation, the rate and direction of CO2 plume migration will be based on continuously recorded pressures and temperatures at the three injection wells and the In-Zone Monitoring Well No. 01. Indirect monitoring will be performed using periodic time-lapse surface seismic imaging. Additionally, ExxonMobil will be exploring emergent technologies to support plume monitoring. The Bead Farm Co. #1 was converted to an Above-Zone Monitoring Well and equipped with tubing for fluid collection. Table 5-1 provides a summary of direct and indirect plume and pressure front monitoring technologies.

5.8.1 Direct Pressure Front Tracking

Injection Wells No. 1, No. 02, and No. 03 (Figure 5-4) are equipped with downhole pressure gauges to continuously monitor the pressure in the active completed injection intervals as shown in Appendix D of Section 4 – Well Construction Plan and Operating Conditions. The continuous pressure and temperature measurements will be used to characterize injection well pressure at that location as well as the cumulative pressure response from the other wells completed in the injection zone.

CONFIDENTIAL BUSINESS INFORMATION

China, TX

AVE B
AVE C
AVE D
THERIOT RD
WALDEN RD
S PINE ISLAND RD
NOLIA LN
PINE ISLAND LEVEE RD
PINE ISLAND RD
GREEN POND GULLY RD
LAWHON RD
S CHINA RD
3RD AVE
BOYT RD
Bayou Din
Gallier Canal

USDW Monitoring Well No. 01

In-Zone Monitoring Well No. 01

Rose CCS Project Injection Well No. 03

Above-Zone Monitoring Well No. 01
Bead Farm Co. #1

Rose CCS Project Injection Well No. 01
4224502193

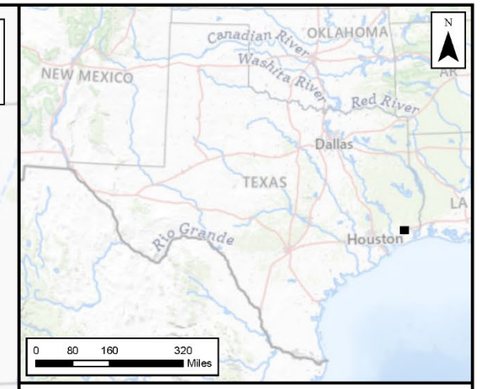
USDW Monitoring Well No. 02
4224502194

Rose CCS Project Injection Well No. 02

USDW Monitoring Well No. 03

N

0 1,250 2,500 5,000 Feet



Legend

- Area of Review
- Injection Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- USDW Monitoring Well
- In-Zone Monitoring Well

Figure 5-4
Location of Pre-Operation Data Collection and USDW Monitoring Wells
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

Source: Esri - World Topographic Map; NAD 1983 StatePlane Texas South FIPS 4205 Feet

FILE: \\SCUSPRDGISFS01\Data\US\Projects\D-F\ExxonMobil\0672315 ExxonMobil CCS ETX\APRX\Rose\Site_Char_Figures_July2024.aprx, REVISED: 07/17/2024 , SCALE: 1:34,607 when printed at 24x36 DRAWN BY: GIS
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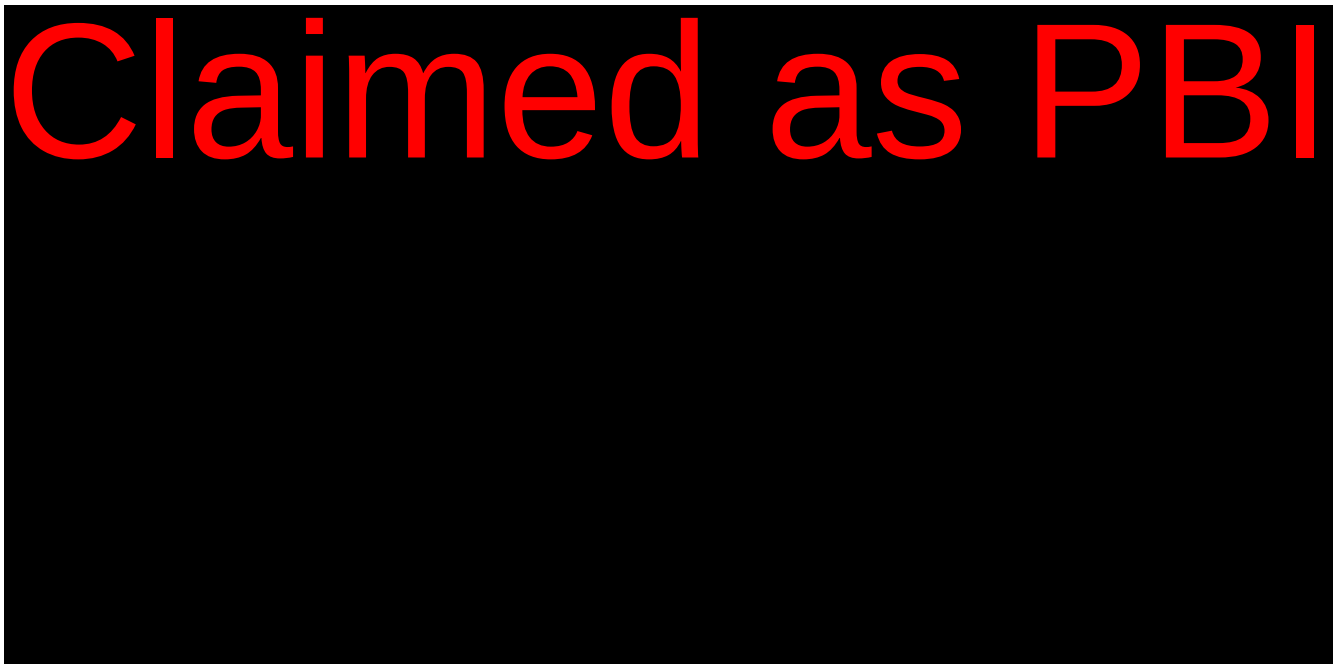
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Any periods of shut-in for an injection well may be observed and treated as a fall-off test by recording the shut-in wellhead pressure, bottomhole pressure, and temperature readings. This information, together with the continuous measurements obtained during regular operating conditions, will aid in updating the plume models and forecasts.

5.8.2 Plume and Pressure Front Tracking Using Indirect Geophysical Techniques

ExxonMobil will use periodic surface seismic data acquisitions and time-lapse data analysis as the primary indirect method for tracking the CO2 plume migration consistent with the operation monitoring requirements specified in 40 CFR 146.90(g)(2). An existing 3D-seismic survey will serve as Survey Event #1, representing the pre-injection subsurface characterization baseline and the baseline for time-lapse data analysis. This baseline 3D survey is comprised of two early 2000's vintage proprietary datasets and is undergoing reprocessing by a recognized industry-leading vendor. Surface seismic monitoring surveys will be acquired during the injection stages at a frequency that demonstrates conformance between the reservoir model simulation and site performance. Post-operational survey events will be utilized during the post-injection period to confirm the stabilization of the plume and detect CO2 leaks through the UCCZ, should they occur.

ExxonMobil considers time-lapse seismic analysis to be a proven method for imaging subsurface changes in oil and gas exploration, enhanced oil recovery (EOR), and production. This methodology has been applied previously by Denbury Inc. in the Frio formation at a Gulf Coast EOR field (Holmes et al., 2023) to monitor the movement of injected CO2 through time. A summary of the results of this time-lapse surface seismic study are shown in Figure 5-5. The red and yellow colors in Figure 5-5 represent the movement of CO2 in the Frio formation over time.



During CO2 injection operations, seismic data will be acquired periodically in the time-lapse seismic monitoring plan to monitor the movement of the CO2 plume and calibrate the CO2 plume model. Survey Event #1 was based on a proprietary survey (referred to as Surface Seismic Survey Event #1 or Survey Event #1) acquired as part of the site characterization data acquisition process to establish an initial state of the subsurface fluid distribution.

The timing of the Survey Event #2 will occur when the following criteria are met and the analysis of operational and testing data demonstrates compliance with the UIC Class VI permits, likely in the first one to three years of operation:

- The UIC Program Director confirms that the data quality objective for direct measurements and operational data have been achieved and no significant deviations related to data quality are outstanding;
- The CO2 plume and pressure front model has been reasonably calibrated to the actual operational and monitoring results reported to the UIC Program Director;
- The model predicts that the first injection stage is approaching the target storage volume, in compliance with the UIC Class VI Permits for the Project and without threat of endangerment to USDW; and
- The acquisition of indirect monitoring data is necessary to improve the forecast of the end of the initial injection stage and the transition to the next injection stage, while protecting USDW from endangerment of CO2 or brine cross-flow.

Should at any time the acquisition of indirect monitoring data suggest deviation from expected behavior for compliance with the permits, ExxonMobil will discuss the need with the UIC Permit Director and take appropriate action.

Survey Event #3 will occur in the Fleming formation approximately six to eight years after stage 1 startup using the same approach from the injection stages in the Upper Frio Sands.

Survey Event #4 is planned for approximately thirteen years of operations. A significant amount of direct and indirect monitoring data will be available, up to 16 semiannual reports provided to the UIC Program Director, and conclusions made regarding the predictive capabilities of the CO2 plume and pressure front model for both the Upper Frio Sand and the Fleming Sand injection intervals. ExxonMobil expects that the model will be a reliable predictor of the growth rates and extents of CO2 saturation and pressure plumes. With the UIC Program Directors concurrence, Survey Event #4 will occur at the end of operational period, a predicted total of 13 years. Survey Event #4 will yield the indirect measurement of the extent of the CO2 plume at the start of the PISC period.

As described in Section 3 – Area of Review and Corrective Action Plan, the maximum pressure differential within the injection zone diminishes rapidly to just above baseline pressures within the first year of PISC for the Fleming Sands, which is the portion of the injection zone immediately beneath the UCCZ. The decrease in maximum pressure differential in the Upper Frio Sands also drops significantly after year seven of the injection schedule. After injection in the Frio is completed, the model results predict a steady decline to a maximum pressure differential below Claimed as PBI when injection ceases, indicating plume stability. This rapid decline in pressure in the injection zone, along with the performance of the calibrated model, are the primary bases for recommending that no additional surface seismic events may be necessary in the PISC period. In the event that additional surface seismic events are necessary to improve the model's predictive capability or show CO2 plume stability, ExxonMobil will communicate with the UIC Program Director on the nature and timing of such contingent survey events.

In summary, ExxonMobil proposes the following surface seismic monitoring event schedule:

- Survey Event #1: completed as part of the data purchase and reprocess for site characterization;

- Survey Event #2: one to three years from start of operation assuming the triggering criteria are met;
- Survey Event #3: six to eight years from start of operations with conformance to the triggering criteria;
- Survey Event #4: expect to occur at the end of the operations, 13 years from commencement of operations
- The survey event time increment is not to exceed 5 years and may be shortened, conforming to triggering criteria defined by the UIC Program Director; and
- Contingent Additional Survey Events during Operational and PISC Phases: to be determined based on the results from direct and indirect monitoring and model prediction.

The time-lapse data collected during survey events will also be used to monitor for CO2 in the groundwater formation directly above the storage reservoir, utilizing data from both the injection wells and the in-zone monitoring well as an assurance-monitoring technique.

The timing of these survey events will be refined in future updates of the monitoring plan according to 40 CFR 146.90(j). Over time, monitoring methods and data collection may be supplemented or replaced as advanced techniques are developed.

5.9 CO2 Plume Tracking Using Groundwater Monitoring Data

5.9.1 Phased and Triggered Monitoring

The phased and/or triggered monitoring strategy was adopted for the installation of potential additional USDW monitoring wells, soil gas monitoring wells, and air monitoring locations. The phased approach was deemed reasonable and appropriate based on the schedule of CO2 injection for three injection wells and the degree of protectiveness evident based on the geologic site characterization and demonstrated by the plume modeling. This type of approach allows the site-specific testing and monitoring strategies to be tailored to changes in predicted performance and in response to potential increased risks to USDWs identified or detected during the course of injection.

Table 5-4: Summary of Phased and/or Triggered Monitoring Program

Phase	Establish Baseline Conditions	Tracking and Monitoring Initial CO2 Plume and Pressure Front Migration	Sustained Operating Conditions
Time Period	Conducted prior to injection.	From start of operations until at least 50 years after cessation of injection or for the duration of an alternative time frame approved through a successful non-endangerment demonstration.	From end of initial CO2 plume and pressure front tracking to cessation of injection operations, assumed to be 13 years from start.
Description	Measure baseline conditions in the injection zone, above UCCZ, and in USDW for comparison with subsequent detection monitoring data collection.	CO2 plume and pressure front tracking at three injection wells and one in-zone monitor well using direct and indirect technologies as well as groundwater sampling at the above-zone monitoring well and three USDW monitoring wells to demonstrate compliance with the permit requirements.	Continued monitoring with an appropriate number of monitoring wells to track the CO2 plume and pressure front within the AoR, monitor the groundwater, and demonstrate compliance with permit requirements.
Monitored Conditions	Injection Wells: wellhead and bottomhole pressure and temperature measurement. Bead Farm Co. #1: pressure, temperature, groundwater samples collected at selected intervals for baseline groundwater quality and geochemical parameters during well drilling. Additional baseline groundwater sample(s) collected above UCCZ during conversion to Above-Zone Monitoring Well. Survey Event #1: baseline acoustic response of surface to base of Upper Frio Sands. USDW monitoring wells: groundwater quality and geochemical parameters.	Injection Wells: wellhead and bottomhole pressure and temperature. In-Zone Monitoring Well: injection interval pressure and temperature. Above-Zone Monitoring Well: Groundwater samples from first laterally continuous water-bearing zone above UCCZ for water quality and geochemical parameters. Survey Events: three acoustic response events from surface to base of Upper Frio Sands to assess CO2 plume growth within the AoR. USDW monitoring wells: water quality and geochemical parameters.	Injection Wells: wellhead and bottomhole pressure and temperature. In-Zone Monitoring Well: injection interval pressure and temperature. Above-Zone Monitoring Well: Groundwater samples from first laterally continuous water-bearing zone above UCCZ for water quality and geochemical parameters. Contingent Survey Events: to be conducted if additional indirect evidence of CO2 plume stabilization is warranted. USDW monitoring wells: groundwater quality and geochemical parameters.

Phase	Establish Baseline Conditions	Tracking and Monitoring Initial CO2 Plume and Pressure Front Migration	Sustained Operating Conditions
Planned Changes in Monitoring Techniques	None	Frequency of USDW monitoring is quarterly	Additional USDW monitoring wells as needed to characterize geochemical variability in accordance with CO2 plume migration and pressure front.
Monitoring Locations	Three injection wells One In-Zone Monitoring Well One Above-Zone Monitoring Well (Bead Farm Co. #1) Three USDW monitoring wells Seismic: CO2 Plume Area	Three injection wells One In-Zone Monitoring Well One Above-Zone Monitoring Well Three USDW monitoring wells Seismic: CO2 Plume Area	Three injection wells One In-Zone Monitoring Well One Above-Zone Monitoring Well Three to seven USDW monitoring wells Seismic: CO2 Plume Area
Monitoring Frequencies	Injection Wells: single event measurements and samples at time of installation In-Zone Monitoring Well: continuous pressure and temperature measurements for each injection interval. Above-Zone Monitoring Well: Quarterly fluid samples from first water-bearing zone above UCCZ for two years. Stratigraphic Test Well: single event measurements and samples at time of installation USDW Monitoring Wells: Quarterly Survey Events: Survey Event #1 baseline event prior to start of operations	Injection Wells: continuous pressure and temperature. Annual pressure fall-off testing during shut-in. In-Zone Monitoring Well: continuous pressure and temperature measurements for each injection interval. Above-Zone Monitoring Well: Quarterly fluid samples from first water-bearing zone above UCCZ USDW Monitoring Wells: quarterly fluid samples Survey Events: Survey Event #2 within first one to three years after injection, Survey Event #3: six to eight years into injection, Survey Event #4: at 13 years from start of operations. Contingent additional survey events as needed and approved by UIC Program Director.	Injection Wells: continuous pressure and temperature. Survey events at reasonable time periods to confirm CO2 plume tracking and demonstrate compliance with permit requirements. Annual pressure fall-off testing during shut-in. In-Zone Monitoring Well: continuous pressure and temperature measurements for each injection interval. Above-Zone Monitoring Well: Quarterly fluid samples from first water-bearing zone above UCCZ USDW Monitoring Wells: Annual fluid samples. Survey Events: None planned. Sufficient data, model calibration, and rapid declines in maximum pressure differential are expected to reduce the need for subsequent surface seismic events during PISC. Contingent additional survey events as needed and approved by UIC Program Director.

Phase	Establish Baseline Conditions	Tracking and Monitoring Initial CO2 Plume and Pressure Front Migration	Sustained Operating Conditions
Triggers	Expand list of geochemical parameters and install additional USDW monitoring wells if unexpected trends or variability are apparent.	Table 3-21 in Section 3 – Area of Review and Corrective Action Plan provides a list of triggers for the AoR reevaluation process. Those triggers are applicable to the monitoring program.	Table 3-21 in Section 3 – Area of Review and Corrective Action Plan provides a list of triggers for the AoR reevaluation process. Those triggers are applicable to the monitoring program.
Note: The word “continuous” is used to express the frequency of measures collected during monitoring equipment operation is defined as the instrument’s normal data collection frequency as defined by the manufacturing. The frequency will vary by instrument and application. Measurements that are collected “continuously” will be averaged across a reasonable and appropriate time interval for reporting the detection monitoring results during the operational phase of the Project.			

5.9.2 Design of the Monitoring Well Network

The monitoring well network includes the monitoring wells that will be used to support compliance with the testing and monitoring requirements under the Class VI Rule. Combined with the monitoring of pressure build-up at each injection well, the design of the monitoring well network was selected to provide a high degree of confidence in detecting a leak through the confining zone that may endanger USDW. The relevant site data considered for the design of the monitoring well network included the phased injection depths, rate, and volume; the geology, and the presence of the legacy wells as required at 40 CFR 146.90(d)(1) and (2).

5.9.3 USDW Monitoring Well Construction

To comply with 40 CFR 146.90(d), a phased approach to USDW monitoring well installation is proposed. Initially, three USDW monitoring wells were completed at the locations shown on Figure 5-4. These locations were selected to provide a baseline of geochemical data in the vicinity of the following areas of significant interest:

- Within the Footprint of the Projected CO2 Plume and Adjacent to Public Water Supply: USDW Monitoring Wells No. 01 and No. 02 are located within or near the underlying CO2 plume and in alignment with potential CO2 plume migration toward of the northwest, (toward China, Texas) and in the vicinity of the 9000 to 10500 Block of Lawhorn Road, Beaumont, Texas. The available information suggests that both areas may rely on USDW for potable supply.
- Downgradient of the Injection Wells: USDW Monitoring Well No. 03 is located south of the three injection wells in the anticipated direction of groundwater flow in the Chicot Aquifer. This well will provide groundwater quality measurements downgradient from the highest CO2 plume pressure.

The Chicot Aquifer is the most prolific USDW aquifer within the AoR, and its relatively shallow water-bearing zones are a target for completion of water wells, typically at depths ranging from approximately 150 to 400 feet (ft) below ground level (BGL) in the AoR. The depth of the USDW monitoring wells was selected to be consistent with the total depths of water wells in the area and will provide data to assess whether significant changes in water quality are occurring at the depth of most water wells. These three USDW monitoring wells will provide an initial baseline of USDW quality prior to injection and then monitor for changes in USDW quality during injection and PISC.

Claimed as PBI [redacted] The bottom of the USDW was confirmed by both literature review and through the collection of open-hole wireline logs at the stratigraphic well (Bead Farm Co. #1) in November 2023, confirming the literature-cited depths of the lowermost USDW. The close correlation of the top of the Evangeline Aquifer and the elevated concentrations of TDS above 10,000 mg/L was sufficient evidence that monitoring groundwater quality at this depth could have a high potential for false positive detections of brine presumed to be associated with brine leakage through the UCCZ. For this reason, no USDW monitoring wells were located in the Evangeline Aquifer.

Other potential leakage points were considered for USDW monitoring wells, but the available evidence and evaluation indicated that no significant risk was apparent. For example, the model simulations of pressure near fault planes were found to be below levels deemed necessary to cause transmissivity that might result in the potential for CO2 and/or brine to leak from the

injection zones to USDW. Along-fault fluid migration is not a significant risk because as shown in Section 2.5.9.2 of Section 2 – Site Characterization, Shale Gouge Ratio (Yeilding et al., 1997) values of greater than 90% within faults intersecting confining intervals demonstrate robust fault seal, well above a conservative 50% cut-off, and significantly higher than the empirically determined value of 15-20% (Manzocchi et al. (1999); Sperrevik et al. (2002)). The critical pressure front does not intersect Fault 2_2, the only fault that extends through the UCCZ (Section 2.5.9.2 of Section 2 – Site Characterizatoin). Therefore, no USDW monitoring wells were proposed near fault planes. The time-lapse seismic monitoring collected during operations will be used to validate the model prediction of pressure and fault transmissivity.

Amendments to the Testing and Monitoring plan will be submitted to the UIC Program Director for approval, incorporated into the permit, and subject to permit modification requirements. At this time, it was assumed that up to four additional USDW monitoring wells, if necessary, could be completed in a phased approach to expand USDW monitoring coverage commensurate with the expanse of the CO2 plume and pressure front. The target schedule for expansion is after an initial period from the start of operations. During this time, data will be collected to reduce the uncertainty in CO2 plume and pressure front migration. The locations of any potential additional USDW monitoring wells will be selected for areas where a risk of leakage either remains uncertain or plume and pressure tracking indicators that a leakage feature, such as a legacy well, warrant additional groundwater monitoring.

5.9.4 Summary of Water Well Data for the AoR

Table 5-5 provides a summary of the USDW monitoring well construction details for USDW Monitoring Wells No. 01, No. 02, and No. 03. The well construction details for additional USDW monitoring wells (if constructed) will be consistent with the construction details in Table 5-5.

A total of 11 water wells in addition to the project monitoring wells were identified in and near the AoR as listed on Table 5-6 from the Texas Water Development Board well registration list and the Texas Commission on Environmental Quality environmental well database. Appendix F-1 illustrates the location of the water wells. Each of these wells is completed in the Chicot Aquifer with a maximum depth of approximately 440 ft BGL. The Project will monitor pressure and CO2 plume growth using indirect seismic measurements, water samples collected from USDW Monitoring Wells No. 01, No. 02, and No. 03 (Table 5-5), and measurements of temperature and pressure from In-Zone Monitoring Well No. 01. If the growth of either the pressure or CO2 plume is found to exceed the expected growth based on corroboration of multiple of the above-mentioned measurements, the Project will reevaluate the need for additional USDW groundwater monitoring wells. Expected growth will be defined by the modeled plume size (Section 3.7 of Section 3 – Area of Review and Corrective Action Plan). This will be prioritized near local communities or densely populated areas.

Table 5-5: Summary of USDW Monitoring Well Construction Details

USDW Monitoring Well	NAD83 (2011)	Latitude	NAD83 (2011)	Longitude	Total Depth (ft BGL)	Screened Interval (ft BGL)
USDW Monitoring Well No. 01	30°01'51.6497"	30.0310138	-94°18'38.9290"	-94.3108136	330	300-320
USDW Monitoring Well No. 02	30°00'09.5150"	30.0026431	-94°16'28.5845"	-94.2746068	350	320-340
USDW Monitoring Well No. 03	29°59'15.7081"	29.9876967	-94°17'56.3342"	-94.2989817	330	300-320

Table 5-6: Summary of Available Water Well Completion Details for AoR

Well Report ID	NAD83 (2011)	Reported Latitude	NAD83 (2011)	Reported Longitude	Well Type	Well Owner	Date Completed	Borehole Depth	Status or Plugging and Abandonment Date
645970	29° 59' 56.49" N	29.99903	94° 17' 53.14" W	-94.2981	Rig Supply	Exxon Mobil	8/11/2023	290	In Use
6162901	30° 0' 4.98" N	30.00139	94° 16' 14.86" W	-94.2708	Plugged and Destroyed	D. S. Wier	8/27/1941	7	Not Available
670175	29° 59' 59.49" N	29.999857	94° 16' 59.56" W	-94.28321	Water Rig Supply	Exxon Mobil	6/14/2024	300*	Active
670177	29° 59' 26.58" N	29.990716	94° 17' 55.08" W	-94.298632	Water Rig Supply	Exxon Mobil	7/2/2024	300*	Active
674757	30° 00' 44.74" N	30.012428	94° 17' 52.47" W	-94.297908	Water Rig Supply	Exxon Mobil	7/19/2024	300*	Active
675893	30° 01' 19.01" N	30.021947	94° 17' 39.12" W	-94.294199	Water Rig Supply	Exxon Mobil	8/15/2024	300*	Active
678489	30° 00' 09" N	30.0025	94° 16' 28" W	-94.274444	Monitoring Well	Exxon Mobil	8/20/2024	440*	P&A Date 11/5/2024
689934	29° 59' 57.37" N	29.99927	94° 17' 8.34" W	-94.28565	Monitoring Well	Exxon Mobil	9/19/2024	25*	Active

Well Report ID	NAD83 (2011)	Reported Latitude	NAD83 (2011)	Reported Longitude	Well Type	Well Owner	Date Completed	Borehole Depth	Status or Plugging and Abandonment Date
689935	29° 59' 26.23" N	29.99062	94° 17' 54.96" W	-94.2986	Monitoring Well	Exxon Mobil	9/17/2024	25*	Active
689936	30° 00' 44.57" N	30.01238	94° 17' 52.69" W	-94.29797	Monitoring Well	Exxon Mobil	9/17/2024	25*	Active
689937	30° 00' 9.65" N	30.00268	94° 16' 26.51" W	-94.27403	Monitoring Well	Exxon Mobil	9/18/2024	20*	Active

1 groundwater sample per well will be collected using decontaminated submersible pumps equipped with new dedicated and disposable sampling tubing capable of producing representative groundwater samples to the surface with the least pumping effort. The fluid sampling parameters and frequencies for the above-zone and USDW monitoring wells are shown in Table 5-8. Additional USDW monitoring wells will be added to assess the potential for USDW endangerment if necessary. Well completion diagrams are provided for USDW Monitoring Wells No. 01 to No. 03 in Appendices F-2 to F-4.

5.9.5 Construction of In-Zone Monitoring Well and Above-Zone Monitoring Well (Bead Farm Co. #1)

In-Zone Monitoring Well No. 01

In-Zone Monitoring Well No. 01 was constructed to collect pressure and temperature measurements from the four injection intervals. Table 5-7 provides the completion details for the well. In-Zone Monitoring Well No. 01 was equipped with a tubing encapsulated conductor cable with in-line pressure/temperature gauges to collect continuous pressure and temperature measurements for evaluating the rate of CO2 plume and pressure front movement. A schematic of In-Zone Monitoring Well No. 01 is provided in Appendix F-5.

In-Zone Monitoring Well No. 01 was constructed up-dip from the location of the three injection wells (Figure 5-4) to establish direct measurements of pressure and temperature in the injection intervals at a non-active location.

The In-Zone Monitoring Well No. 01 was equipped with a fiber optic gauge cemented behind the production casing. As shown on Appendix F-5, a fiber optic cable was cemented in the annulus of the long-casing string of the in-zone monitoring well for annual mechanical integrity testing.

Above-Zone Monitoring Well No. 01

After abandoning the injection interval, Bead Farm Co. #1 was converted to an Above-Zone Monitoring Well to collect groundwater samples from the first laterally continuous water-bearing zone above the UCCZ. Table 5-7 provides the completion details for the well. The Above-Zone Monitoring Well was equipped with a tubing string and packer as a conduit to collect groundwater samples. A schematic of the Above-Zone Monitoring Well No. 01 is provided in Appendix F-5.

The Above-Zone Monitoring Well No. 01 is centrally located from the location of the three injection wells (Figure 5-4) to establish direct measurements of groundwater samples in the injection intervals at a non-active location.

Once operations commence, groundwater samples will be collected from the first laterally continuous water-bearing zone above the UCCZ via the Above-Zone Monitoring Well No. 01 for analysis of geochemical concentrations on a quarterly frequency for the operational period.

Continuous pressure and temperature measurements will be recorded in In-Zone Monitor Well No. 01 for semiannual reporting using a downhole pressure gauge (illustrated in Appendix F-5 as a tubing encapsulated conductor cable and gauges mounted behind the casing). The primary line of evidence for assessing whether a threat to USDW is apparent will be based on a geochemical data assessment. Pressure and temperature trends will be considered as secondary lines of evidence and will be evaluated to assess significance of trends and the potential for instrumentation error to have caused false or erroneous measurements.

No additional monitoring wells were deemed necessary at this time based on the model-predicted CO2 plume movement and monitoring program, the significant porosity/permeability thickness and layering present in the injection zones and the extensive UCCZ present at the

site. In the event of unexpected CO2 plume migration, the location of additional monitoring wells will be proposed through a revision to this Testing and Monitoring Plan.

Table 5-7: General Details for In-Zone and Above-Zone Monitoring Wells

Monitoring Well Location Info	Above-Zone Monitoring Well No. 01 (Bead Farm Co. #1)	In-Zone Monitoring Well No. 01
NAD83 (2011) Latitude	29°59’57.1992”N	30°01'16.85"N
NAD83 (2011) Longitude	94°17’50.5093”W	94°17'37.65"W

5.9.6 Collection and Analysis of Groundwater Samples

One fluid sample per well will be taken periodically from the USDW monitoring wells and Above-Zone Monitoring Well No. 01 (Bead Farm Co. #1). The Above-Zone Monitoring well will target the first laterally continuous sand above the UCCZ, which is approximately 1,000’ below the base of the USDW. The USDW monitoring wells target the Chicot Aquifer, which is the most used aquifer in the AoR for potable and non-potable purposes. The sampling frequency for the Above-Zone and USDW monitoring wells is quarterly. This quarterly sampling characterizes the potential seasonal fluctuation in this USDW.

Table 5-8 summarizes the parameters analyzed and the planned sampling frequency, which apply to the USDW and Above-Zone Monitoring wells. Anomalous measurements will trigger re-sampling and additional data analysis, including a more detailed evaluation of data using statistical comparisons approved by EPA for detection monitoring programs. This analysis could also include geochemical modeling to compare the compositions of groundwater from before and during operations.

If warranted, other tests may be added to the evaluation if re-sampling and detailed analysis of the fluid samples does not satisfactorily rule out a leakage scenario.

Table 5-8: USDW and Above UCCZ Monitoring Sampling Program

Parameter/Analyte	USDW Monitoring Well Frequency	Monitoring Frequency above the UCCZ
TDS, alkalinity, electrical conductivity, temperature, pH	Quarterly	Quarterly
Gas composition (CO2, CH4, O2, N2)		
Dissolved cations (Ba, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, P, K, Si, Na, Sr, V, Zn)		
Dissolved anions (HCO3, B(OH)4, Br, CO3, Cl, F, I, NO3, NO2, PO4, SO4, S)		
Note: Ba = Barium; B(OH)4 = Tetrahydroxyborate; Br = Bromide; Ca = Calcium; Cd = Cadmium; CH4 = Methane; Cl = Chloride; CO2 = Carbon dioxide; CO3 = Carbonate; Co = Cobalt; Cr = Chromium; Cu = Copper; F = Fluoride; Fe = Iron; HCO3 = Bicarbonate; I = Iodide; Li = Lithium; Mg = Magnesium; Mn = Manganese; Mo = Molybdenum; N2 = Nitrogen; Na = Sodium; Ni = Nickel; NO2 = Nitrite; NO3 = Nitrate; O2 = Oxygen; P = Phosphorus; K = Potassium; PO4 = Phosphate; Si = Silicon; SO4 = Sulfate; Sr = Strontium; S = Sulfur; TDS = Total Dissolved Solids; V = Vanadium; Zn = Zinc		

5.9.6.1 Analytical Methods

ExxonMobil will test the fluid samples and maintain results for the parameters listed in Table 5-8. Both in-field pH measurements and laboratory-based chemical analysis will be performed. If results indicate the existence of impurities in the injection stream, the significance of these

constituents relative to the protection of USDW will be assessed to determine if they should be included in the analysis of the water samples. Testing results will adhere to the reporting requirements as outlined in 40 CFR 146.91(e).

Fluid chemistry data will be monitored for deviations from baseline values. During the injection phase as baseline data is still being collected, the concentration range for the baseline will be taken as the arithmetic mean of all currently collected baseline data +/- 35%. This assumes that laboratory analyses will have an uncertainty of ~25% and aquifer inhomogeneity will contribute an additional ~10% uncertainty. If deviations from the baseline are outside of this range, the numerical model will be reevaluated. Following the injection phase where a statistically robust dataset for the baseline will be available, the concentration range for the baseline will be taken as the arithmetic mean of the baseline data +/- the 95% confidence interval. If deviations from the baseline are outside of this range, the numerical model will be reevaluated.

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Potential geochemical signs that fluid may be leaking from the injection interval may be detected upon observation of the following trends:

- Change in TDS;
- Change in signature of major cations and anions;
- Increase in CO2 concentration;
- Decrease in pH;
- Increase in concentration of injectate impurities; and
- Increase in concentration of leached constituents.

5.9.6.2 Laboratory to be Used/COC Procedures

The fluid samples will be transported to an accredited and state-approved laboratory for analysis. ExxonMobil will observe standard COC procedures and maintain records to allow full reconstruction of the sampling procedure, storage, and transportation, including any problems encountered.

5.9.6.3 Quality Assurance and Surveillance Measures

ExxonMobil will collect replicate samples and sample blanks for quality assurance / quality control purposes. The samples will be used to validate test results, if needed.

5.9.6.4 Plan for Guaranteeing Access to All Monitoring Locations

Placement of the well locations is optimized to be accessible from roads.

5.9.7 Injection Interval Monitoring

In-zone fluid samples were collected from the stratigraphic test well and were analyzed for water quality and geochemical parameters. The results of these tests were provided in Section 2 – Site Characterization, Appendix B.1. In-zone fluid sampling is not proposed as a monitoring mechanism. ExxonMobil plans to monitor CO2 plume growth via time-lapse surface seismic, which is better suited to tracking three-dimensional plume growth than fluid sampling (which is a point measurement). Pressures and temperatures will be monitored in all injection intervals [redacted] through seventeen gauges installed in the In Zone Monitoring Well. This combination of surface seismic and continuous in-zone pressure /

temperature measurements will aid in the tracking and modeling of the CO2 plume and pressure front over time.

5.9.8 Seismic Monitoring (Induced Seismicity)

Based on the projected operating conditions and regional and local geologic conditions, injection operations are not expected to result in an induced seismic event mandating a response action. However, ExxonMobil has installed a permanent seismicity monitoring system onsite, which is being monitored by a third party to detect seismic activity prior to and during injection operations. This array has been recording baseline data since 1 July 2024. The design of the array consists of a near-surface network of seismometers with continuous data sampling, incorporation of publicly available data, and telemetry to cloud-based storage. Near-real-time, high-resolution signal processing and quality assurance will be implemented for event detection, magnitude, and location accuracy. ExxonMobil will additionally receive notifications from USGS of recorded seismicity events for the site and surrounding area, should an event occur. If a review of the data indicates that the event was within a 5.6 mi radius of an injector (as specified in Table 8-3), ExxonMobil will notify the UIC Program Manager to jointly determine if the events are likely to be associated with the operations, and, if so, implement response actions for seismic events as contained in Table 8-3.

5.10 Reporting Requirements

The Testing and Monitoring Plan was developed to achieve two reporting objectives:

- Provide the necessary data to verify predictions of CO2 plume and pressure front movement; and
- Provide the basis for evaluating the model inputs, making necessary changes, and reevaluating the AoR.

In compliance with 40 CFR 146.91, ExxonMobil will provide reports to the UIC Program Director in routine semiannual reports that document the performance of the system and CO2 plume and pressure front tracking data. Relevant records pertaining to the Class VI Testing and Monitoring program will be submitted to the EPA. In addition, ExxonMobil will follow the prescribed notification requirements for deviation from permit conditions, operational malfunction that may allow CO2 or brine to migrate into or between USDWs, or for other evidence of USDW endangerment.

The semiannual reports will include the data collected during each reporting period and a list of notifications triggered during a semiannual period, if any. The following information is proposed for the routine performance reporting:

- Monthly average, maximum, and minimum values of injection pressure, flow rate and volume, and annular pressure;
- Monthly volume and/or mass of the CO2 stream injected over the reporting period, and the volume injected cumulatively over the life of the Project;
- Monthly annulus fluid volume added;
- Results of CO2 plume and pressure front tracking as described herein;
- Any significant changes to the physical, chemical, and other relevant characteristics of the CO2 stream from the proposed operating data that could impact plume migration or protection of USDWs;

- A description of any event which triggered a shut-off device required to 146.88 (e) and the response taken; and
- A description of any event that exceeded operating parameters for annulus pressure or injection pressure specified in the permit.

The semiannual reports will be submitted 30 days after the completion of the quality control, quality review of the data for each reporting period. Table 5-9 describes the non-routine reporting triggers, contents, and schedule.

Table 5-9: Summary of Triggering Events for Notification and Reporting Schedule

Triggering Event	Reporting Schedule
Planned well workover, stimulation activities, or other planned test of an injection well.	Notification to the UIC Director, in writing, 30 days in advance of planned activity.
Completion of well workover.	30 days after completion of well workover.
Any test of the injection well conducted, if required by the UIC Director.	30 days after completion of any testing required by UIC Director.
Evidence of potential non-compliance with a permit condition, or malfunction of the injection system that may cause fluid migration into or between USDWs.	Verbal Notification – Reported within 24 hours of non-compliance or malfunction.
Evidence that the injected CO2 stream or associated pressure front may cause an endangerment to a USDW.	Verbal Notification – Reported within 24 hours of endangerment
A failure to maintain mechanical integrity.	Verbal Notification – Reported within 24 hours of MIT failure
A change in CO2 concentration that results in a value less than or equal to 96% [% = mol % = volume %] in the injection stream. The injection stream will be >97% carbon dioxide. A significant deviation which would warrant notification to the UIC director is if that stream changes to a value less than or equal to 96%.	Written Notification – Reported within 72 hours of concentration change.
An operational condition that exceeds operating parameters for annulus pressure or injection pressure as specified in the permit.	Verbal Notification – Reported within 24 hours of non-compliance with permit conditions. Written Notification – Reported within 72 hours of non-compliance with permit conditions.
A shut-off device anywhere in the injection well system that is triggered.	Verbal Notification – Reported within 24 hours of event. Written Notification – Reported within 72 hours of event.

ExxonMobil will submit all reports, submittals, and notifications to both the EPA and the RRC and retain records in accordance with 40 CFR 146.91(f) for a 10-year period after site closure. Additionally, injected-fluid data, including nature and composition, will also be retained for the 10-year period following site closure. Monitoring data will be retained for a minimum of 10 years post-collection, while well-plugging reports, PISC data, and the site closure report will be retained for 10 years after site closure.

5.11 Testing Plan Review and Updates

In accordance with 40 CFR 146.90(j), the Testing and Monitoring Plan will be reviewed and revised at a minimum of every five years to:

- Identify Project-specific factors that may warrant revision to the Plan;
- Incorporate information and changes necessary to monitor an increase in risk to or endangerment of USDWs; and/or
- Deviations from permitted conditions that require Plan modifications.

ExxonMobil will incorporate the collected monitoring data that characterizes the Project-specific factors and the changes needed, if any, to monitor increased potential risk to USDW and overall Plan compliance with the UIC Director's requirements. Plan amendments will be submitted within one year of an AoR reevaluation, following significant facility changes (such as addition of monitoring wells or newly permitted injection wells within the AoR), or as the UIC Director requires. Table 5-10 summarizes the various measurements discussed in the Testing and Monitoring Plan and the frequency of measurements for data collection and reporting purposes.

Table 5-10: Testing and Monitoring Plan Measurements and Frequency

Equipment / Measurement	Regulation	Objective	Frequency
Coriolis flow meter	146.90b	Measure mass flow rate	Continuously
Corrosion coupon	146.90c	Measure corrosion levels on the types of metal used in the Project	Quarterly
Injection stream sampling	146.90a	Provide more detailed analysis via periodic lab analysis of injection stream	Quarterly
Central pad temperature gauge	146.90a	Measure temperature of the total injection stream at the pad before partitioning to injections	Continuously
Injection wellhead tubing Pressure gauge	146.90a	Measure downstream of choke	Continuously
Injection wellhead annulus Pressure gauge	146.90b	Verify annulus pressure maintained	Continuously
Injection annulus pressure test	146.89b	Verify absence of leak in annulus	Annually
Injection Well downhole pressure and temperature gauge for active/open injection interval	146.90b	Measure downhole pressure and temperature (injection mass to volume conversion, verifying that it is not exceeding maximum pressure)	Continuously
	146.90f	Measure fall-off of pressure after abandoning injection stage and initiating injection in next stage above	At the end of every injection stage
	146.90g(1)	Direct measurement of pressure, sensitive to pressure from other injections, especially when injection intervals are staggered between wells	Continuously
Time-lapse surface seismic survey	146.90g(2)	Indirect method to monitor CO2 plume growth in the subsurface over time	Frequency from start of operations: Survey Event #1: completed; Survey Event #2: one to three years; Survey Event #3: six to eight years; Survey Event #4: 13 years. Contingent additional survey events as needed and approved by UIC Program Director.
	146.87a(3)(ii)	DTS for cement long portion of long-string casing where fiber is cemented in place	One-time event

Equipment / Measurement	Regulation	Objective	Frequency
	146.90e	DTS to assess potential flow through channels through or along cement	Annually
Injection well CIL	146.90e	Through-tubing log to detect loss of metal mass in casing due to corrosion	Baseline only; repeat survey is triggered if risk of leakage is apparent or upon request by UIC Program Director
In-zone monitoring well downhole P/T gauge	Not required	Potential to detect pressure anomaly Claimed as PBI [redacted] in case of leakage; will require careful analysis due to false positive potential from sensor drift, geomechanical effects, and preexisting pressure trends due to potential far-field activities	Continuously
Above-zone monitoring well fluid sampling from above UCCZ	146.90d	Above UCCZ fluid collection is recommended by guidelines	Quarterly
USDW fluid sampling	146.90d	Sample fluids from the Chicot Aquifer which is the most prolific USDW aquifer within the AoR, as recommended by guidelines, and analyze composition	Quarterly
Note: The word “continuous” is used to express the frequency of measures collected during monitoring equipment operation is defined as the instrument’s normal data collection frequency as defined by the manufacturing. The frequency will vary by instrument and application. Measurements that are collected “continuously” will be averaged across a reasonable and appropriate time interval for reporting the detection monitoring results during the operational phase of the Project.			

Underground Injection Control – Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

SECTION 6 – INJECTION WELL PLUGGING PLAN

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage LLC

May 2025

SECTION 6 – INJECTION WELL PLUGGING PLAN

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Appendix H – Plugging Schematics and Procedures

Appendix H.1: Plugging Schematics and Procedures

- Appendix H.1-1: Plugging Schematic for Rose CCS Project Injection Well No. 01
- Appendix H.1-2: Plugging Schematic for Rose CCS Project Injection Well No. 02
- Appendix H.1-3: Plugging Schematic for Rose CCS Project Injection Well No. 03

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6.0 Injection Well Plugging Plan

ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) is submitting this Underground Injection Control Class VI permit application to the United States Environmental Protection Agency for the Rose Carbon Capture and Storage (CCS) Project (Project). ExxonMobil is undertaking the Project in Jefferson County, Texas, to sequester a maximum of 5 million metric tonnes per annum of carbon dioxide (CO2) using three injection wells over an injection period of up to 13 years. The predicted total CO2 storage is 53 million metric tonnes. The Injection Well Plugging Plan section for the Project Class VI Underground Injection Control (UIC) Permit Application was prepared to meet the requirements of the Code of Federal Regulations, Title 40, Section 146.92 [40 CFR 146.92] and Texas Administrative Code, Part 1 Title 16 Chapter 5 for plugging and abandonment (P&A) of the Rose CCS Project Injection Wells No. 01, No. 02, and No. 03. The purpose of the Plugging Plan is to demonstrate the actions that ExxonMobil will take to mitigate the threat to underground sources of drinking water (USDW) during the post-injection period.

ExxonMobil has obtained a substantial amount of data and analyses from the core sampling and analysis program for the Project's stratigraphic well (Bead Farm Co. #1; American Petroleum Institute 4224532908). This data has been incorporated into the Area of Review model to show the extent of the CO2 plume and critical-pressure front and the operating strategy for CO2 storage.

In alignment with Statewide Rule §5.203(k)(1)(C)ExxonMobil has selected materials for plugging the injection wells that will resist the corrosive properties of the injection fluid to maintain mechanical integrity of the plug and well casing. The planned plugging procedures are aligned with best practices for restoring the upper composite confining zone (UCCZ) integrity at each injection well location. ExxonMobil has a staged perforation schedule for the injection wells to optimize the storage of CO2. As a result, multiple injection well "plug-back" events will be undertaken to move from one injection interval to the next prior to permanent well closure. Once the storage capacity has been reached, the last injection interval and the remainder of the injection well will be plugged for final abandonment.

Separately, the procedures and details for the stratigraphic well P&A are included in this plan for completeness purposes.

6.1 Objectives

The Plugging Plan represents one of the final steps in the lifecycle of each of the three injection wells for the Project. ExxonMobil will properly plug and abandon the injection wells, maintain the integrity of the UCCZ throughout the remainder of the post-closure care period, and monitor the performance of the plugged wells to contain CO2 and brine in the injection zone, reducing the potential risk of USDW endangerment.

The Plugging Plan and procedures were designed to meet the following objectives:

- Measure the bottomhole reservoir pressure prior to conducting plugging activities [40 CFR 146.92(b)(1)];
- Assess the external mechanical integrity of the long-string casing by using appropriate testing methods to demonstrate isolation consistent with 40 CFR 146.92(b)(2);

- Select the type, grade, and quantity of material to be used in plugging to withstand contact with CO2 and acidified liquids in the injection intervals [40 CFR 146.92(b)(5)]; and
- Detail the methods, locations, and types of plugs used within the well [40 CFR 146.92(b)(4) and 40 CFR 146.92(b)(6)].

6.2 Preparation of Well Prior to Plugging

Prior to plugging, the well will be flushed with a kill weight fluid, the bottomhole pressure will be measured, well components will be removed as needed, and an external mechanical integrity test (MIT) will be performed. The proposed plugging methods and materials used are corrosion compatible to the injection interval conditions.

As needed, ExxonMobil will repair deficiencies identified during the life of the well to mitigate potential leaks to USDWs [40 CFR 146.88(f)]. Historical MIT data and prior remedial measures will be considered prior to plugging operations. If required, those remedial activities will be included in an amendment to this plan.

6.2.1 Flushing Well with Kill Weight Fluid

Pressure control will be accomplished through the use of kill weight brine that is weighted and compatible with the injectate and formation fluids. The brine will be weighted to provide a minimum Claimed as PBI [redacted]. The kill weight brine fluids will be circulated through the injection well to remove fluids or fine debris that could have a significant impact on the integrity of cementing operations. The following components that have been in contact with injection or annular fluids will be flushed:

- Any components in the annular space between the injection tubing and the production casing;
- The long-string casing;
- The perforated injection zone; and
- The injection packer, if needed.

Claimed as PBI [redacted]. After the well has ceased operation, flushing fluid will be circulated through tubing to flush the well of free solids, as necessary.

6.2.2 Removal of Well Components and Obstructions

The removal of well equipment prior to plugging will be completed at the end of the injection period for each well with the objective to open the well for access. In general, uncemented and non-permanent components of the well will be removed. This includes downhole monitoring devices and potentially shut-off devices. The tubing will be pulled from the well.

The surface and long-string casings will be cemented to the surface and will remain in place.

6.2.3 Planned Tests or Measures to Determine Bottomhole Pressure

Prior to each interim plug-back from total depth and prior to permanent abandonment, ExxonMobil will measure the bottomhole reservoir pressure using the downhole pressure

temperature (DHPT) gauge installed above the packer as discussed in Section 4 – Well Construction Plan and Operating Conditions. The bottomhole pressure will be calculated by multiplying the CO2 gradient by the difference in depth between the DHPT gauge and top of perforation, and adding this to the pressure observed at the DHPT gauge, i.e., BHP = (CO2 gradient x (top perforation – DHPT depth)) + DHPT Pressure gauge. The bottomhole reservoir pressure will be used to estimate the density of kill weight brine needed to establish static equilibrium prior to plug placement.

6.2.4 Planned External MITs

MIT will be used to identify that there is no significant leak in the casing, tubing, or packer; and there is no significant fluid movement into a USDW through channels adjacent to the injection wellbore [40 CFR 146.89(a)]. ExxonMobil will conduct on an annual basis at least one of the tests listed in Table 6-1 as part of the monitoring program, to verify external mechanical integrity as required in 40 CFR 146.92(a).

Table 6-1: External MIT Methods

Test Description	Method of Testing
Temperature Log	Wireline log and distributed temperature sensing with fiber cable installed in the wells
Oxygen Activation/Pulse Neutron Log	Wireline log

The results of the MIT will be documented and provided to the UIC Program Director once per year in digital form.

If any deviation from the baseline logs performed with respect to the UCCZ and potential flow toward USDW are identified, the UIC Program Director will be informed and an investigation will be performed.

Conditions that constitute a pass/fail for the MIT logs are as follows:

- Temperature Log: A potential breach of CO2 out of zone can be identified by changes in temperature profile above the UCZ compared to baseline logs and other post-injection logs. Cooler than expected temperature anomalies above the UCZ may indicate integrity issues and further logs will be performed to investigate the anomalies.
- Pulse Neutron Log in Oxygen Activation mode will be run to confirm fluid movement and quantify rate.

CO2-Compatible Materials

In accordance with 40 CFR 146.92(b)(3) and (5) and Statewide Rule §5.203(k)(1)(C), a cement that is compatible with CO2 will be used as the UCCZ cement plug. The procedures for corrective action on artificial penetrations of the UCCZ were described in Section 3 – Area of Review and Corrective Action Plan. ExxonMobil will evaluate potential cement options prior to implementing the cementing operations with concurrence of the UIC Program Director. The intent is to select a cement system that is designed to provide a long-term cement sheath or plug that can withstand the temperature, pressure, and chemical interactions.

Cement at intervals above the UCCZ will be based on Class H cement. A list of common cement additives is provided in Table 6-2 for the Class H cement to improve setting time,

reduce porosity, and improve overall strength if needed. ExxonMobil will report the wet density and will retain duplicate samples of the cement used for each plug in the plugging reports.

Table 6-2: Common Cement Additives

Additive Type/Category	Additives
Fluid-loss additive	• Cellulosic polymers • Polyamines • Sulfonated aromatic polymers • Polyvinyl pyrrolidone • Polyvinyl alcohol • Acrylamido methyl propane sulfonate copolymers and terpolymers • Bentonite • Latexes • Crosslinked polyvinyl pyrrolidone
Dispersant	• Polynapthalene sulfonate • Polymelamine sulfonate
Retarder	• Lignosulfonates • Hydroxycarboxylic acids • Cellulose derivatives • Organophosphonates • Certain inorganic compounds
Accelerator	• Calcium chloride • Sodium chloride • Sodium silicates
Antifoam agent	• Polyglycol ethers • Silicones

Mechanical plugs will generally be used for intra-zonal isolation of injection intervals. At the UCCZ, a plug may be set in a nipple profile if packer is present prior to pumping a minimum of 130 feet (ft) of CO2-compatible cement.

6.2.5 Planned Site Restoration Activities

After the injection wells have been plugged and abandoned, the wellhead equipment and surface facilities will be removed from the well site. The surface will be restored to a condition agreed upon by the landowner and by the UIC Program Director, as appropriate.

6.3 Injection Well Zonal Isolation and Final P&A

As discussed above, a plug will be set for injection zone isolation and the final P&A will occur at the end of the Project. The following details outline the procedures for both types of plugs to be installed. The volume and depth of the plugs will depend on the final geology and downhole conditions of the well as assessed during final plug and abandon operations.

6.3.1 Zonal Isolation and Intermediate Plug-Back Plan

The injection wells will be completed in multiple intervals within the gross injection zone. Each injection interval will be used for a discrete period (or stage). Once that period has concluded,

the newly completed portion of the injection interval will be isolated to reduce the potential for crossflow conditions to occur. After an injection stage has been isolated, the production casing will be perforated to create a new injection interval. The perforations will occur from bottom to top, starting in the Upper Frio and sequentially moving up to the Fleming Sand 3, 2, and 1 injection intervals.

When a current completion interval has reached the end of its injection period for each well, that set of perforations will be isolated and abandoned. The general procedure for zonal isolation of completion stages within each injection well are defined below.

6.3.1.1 Pre-Zonal Isolation Activities

ExxonMobil will comply with reporting and notification provisions for the UIC Program Director, which require a 60-day advanced written notice before planned recompletion efforts are undertaken [40 CFR 146.92(c)]. A similar notice of recompletion will be communicated to the Railroad Commission of Texas (RRC). The bottomhole reservoir pressure will be measured using the DHPT gauge installed above the packer [40 CFR 146.92(a)]. Schematics of the initial completion for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03 are presented in Appendix D.1.

6.3.1.2 Zonal Isolation Activities

A barrier will be set above the injection zone to be isolated. This is generally completed via a bridge plug or a permanent packer with plug in nipple profile completed with approximately 20 ft of cement. Based on literature review, SPE 12141 suggests the minimum cemented footage required for zonal isolation within 9-5/8” casing would be 15’. Pursuant to Texas Railroad Commission (TRRC) Statewide Rule §3.14 (g)(3), 20' of cement is to be placed on top of the mechanical bridge plug/packer with plug in nipple profile. With the planned plug, in addition to production casing cement, a 20’ plug was deemed acceptable for zonal isolation for the injection stages. The plug integrity will be assessed by conducting a pressure test or tagging. The perforations will not be squeezed.

6.3.2 Final P&A

After injection operations cease and after post-operational monitoring in a well is completed, the injection well will be prepared for final P&A. The general final P&A procedures are described below.

6.3.2.1 Pre-Plugging Activities (Notifications, Permits, and Inspections)

ExxonMobil will comply with reporting and notification provisions and provide written notification to the UIC Program Director 60 days before planned plugging efforts. If changes have been made to the original approved Injection Well Plugging Plan, ExxonMobil will provide the amended Injection Well Plugging Plan [40 CFR 146.92(c)]. A Notice of Intention to Plug and Abandon Form W-3A will be submitted to the RRC at least 5 days before plugging operations are planned to commence. In accordance with 40 CFR 146.92(d), a plugging report will be submitted to the UIC Program Director and RRC within 60 days after plugging. Plugging Record Form W-3 will be filed with RRC District Office 3 within 30 days after plugging.

The following plugging activities are planned for each injection well:

- The bottomhole reservoir pressure will be measured using the DHPT gauge installed above the packer [40 CFR 146.92(a)];
- The external mechanical integrity will be demonstrated through approved testing methods discussed above [40 CFR 146.92(a)]; and
- The injection well will be flushed with a kill weight fluid prior to pulling the injection tubing and packer [40 CFR 146.92(a)], as described in Table 6-3.

Table 6-3: Description of Casing, Tubing, and Other Well Construction Materials to be Removed

Well Component	Size	Injection Well No. 01 Amount	Injection Well No. 02 Amount	Injection Well No. 03 Amount	Notes / Comments
26 lb/ft L80-13Cr Tubing	7 in.	3,501 ft KB	3,510 ft KB	3,412 ft KB	Tubing and gauges will be pulled prior to P&A operations
KB = Kelly Bushing; lb/ft = pound per foot					

6.3.2.2 Plugging Procedure, Injection Well No. 01

The following sequence of plugging procedures are planned:





6.3.2.3 Plug Details, Injection Well No. 01

Table 6-4 provides the plugging details for Injection Well No. 01; Appendix H shows the final plugged schematic.

Table 6-4: Plug Details for Injection Well No. 01

Plug Description	UCCZ Plug	Surface Casing Shoe Cement Plug	USDW Plug	BUQW Plug	Superior Water Quality Plug	Surface Cement Plug
Plug Number	1	2	3	4	5	6
Diameter of Boring in which Plug Will Be Placed	8.5 in.	8.5 in.	8.5 in.	8.5 in.	8.5 in.	8.5 in.
Depth to Bottom of Tubing or Drill Pipe or Mechanical Base (MD)	3,500 ft KB	2,203 ft KB	1,539 ft KB	1,287 ft KB	750 ft KB	30 ft
Sacks of Cement to be Used (each plug)	43	44	41	41	37	11
Slurry Volume to be Pumped (ft^3)	51	47	43	43	39	12
Slurry Weight (lb/gal) [1]	14.5	16.4	16.4	16.4	16.4	16.4

Plug Description	UCCZ Plug	Surface Casing Shoe Cement Plug	USDW Plug	BUQW Plug	Superior Water Quality Plug	Surface Cement Plug
Top of Plug (MD)	3,370 ft KB	2,083 ft KB	1,429 ft KB	1,177 ft KB	650 ft KB	0 ft
Bottom of Plug (MD)	3,500 ft KB	2,203 ft KB	1,539 ft KB	1,287 ft KB	750 ft KB	30 ft
Type of Cement or Other Material	CO2 compatible cement	Class H	Class H	Class H	Class H	Class H
Method of Emplacement	Circulation	Circulation	Circulation	Circulation	Circulation	Circulation
Type of Plug	Balance	Balance	Balance	Balance	Balance	Balance
New Plug?	Yes	Yes	Yes	Yes	Yes	Yes

ft^3 = cubic feet; lb/gal = pound per gallon; MD = measured depth from KB

[1] Proposed slurry density may be modified as needed due to field conditions and vendor availability

Slurry Volume (ft^3) $= \frac{ID^2}{1029.4} \times \text{plug height (ft)} \times 5.615$

CO_2-compatible Class H cement slurry yield: 1.207 ft^3/sack; Portland Class H cement slurry yield: 1.08 ft^3/sack

ExxonMobil's current plan for the UCCZ plug is to utilize Halliburton's proprietary Corrosalock blend or suitable equivalent. However, ExxonMobil plans to revisit blends to incorporate potential future advancements in CO2-compatible cement that may be available at the time of final abandonment. Any changes to the plugging plan will be provided in the required Notice of intent to plug per 40 CFR 146.92(c).

6.3.2.4 Plugging Procedure, Injection Well No. 02

The following sequence of plugging procedures are planned:





6.3.2.5 Plug Details, Injection Well No. 02

Table 6-5 provides the plugging details for Injection Well No. 02; Appendix H shows the final plugged schematic.

Table 6-5: Plug Details for Injection Well No. 02

Plug Description	UCCZ Plug	Surface Casing Shoe Cement Plug	USDW Plug	BUQW Plug	Superior Water Quality Plug	Surface Cement Plug
Plug Number	1	2	3	4	5	6

Plug Description	UCCZ Plug	Surface Casing Shoe Cement Plug	USDW Plug	BUQW Plug	Superior Water Quality Plug	Surface Cement Plug
Diameter of Boring in which Plug Will Be Placed	8.5 in.	8.5 in.	8.5 in.	8.5 in.	8.5 in.	8.5 in.
Depth to Bottom of Tubing or Drill Pipe or Mechanical Base (MD)	3,500 ft KB	2,244 ft KB	1,539 ft KB	1,287 ft KB	750 ft KB	30 ft
Sacks of Cement to be Used (each plug)	43	44	41	41	37	11
Slurry Volume to be Pumped (ft^3)	51	47	43	43	39	12
Slurry Weight (lb/gal) [1]	14.5	16.4	16.4	16.4	16.4	16.4
Top of Plug (MD)	3,370 ft KB	2,124 ft KB	1,429 ft KB	1,177 ft KB	650 ft KB	0 ft
Bottom of Plug (MD)	3,500 ft KB	2,244 ft KB	1,539 ft KB	1,287 ft KB	750 ft KB	30 ft
Type of Cement or Other Material	CO2 compatible cement	Class H	Class H	Class H	Class H	Class H
Method of Emplacement	Circulation	Circulation	Circulation	Circulation	Circulation	Circulation
Type of Plug	Balance	Balance	Balance	Balance	Balance	Balance
New Plug?	Yes	Yes	Yes	Yes	Yes	Yes

ft^3 = cubic feet; lb/gal = pound per gallon; MD = measured depth from KB

[1] Proposed slurry density may be modified as needed due to field conditions and vendor availability

Slurry Volume (ft^3) $= \frac{ID^2}{1029.4} \times \text{plug height (ft)} \times 5.615$

CO_2-compatible Class H cement slurry yield: 1.207 ft^3/sack; Portland Class H cement slurry yield: 1.08 ft^3/sack

6.3.2.6 Plugging Procedure, Injection Well No. 03

The following sequence of plugging procedures are planned:





6.3.2.7 Plug Details, Injection Well No. 03

Table 6-6 provides the plugging details for Injection Well No. 03; Appendix H shows the final plugged schematic.

Table 6-6: Plug Details for Injection Well No. 03

Plug Description	UCCZ Plug	Surface Casing Shoe Cement Plug	USDW Plug	BUQW Plug	Superior Water Quality Plug	Surface Cement Plug
Plug Number	1	2	3	4	5	6
Diameter of Boring in which Plug Will Be Placed	8.5 in.	8.5 in.	8.5 in.	8.5 in.	8.5 in.	8.5 in.
Depth to Bottom of Tubing or Drill Pipe or Mechanical Base (MD)	3,400 ft KB	2,203 ft KB	1,539 ft KB	1,287 ft KB	750 ft KB	30 ft
Sacks of Cement to be Used (each plug)	43	44	41	41	37	11
Slurry Volume to be Pumped (ft^3)	51	47	43	43	39	12
Slurry Weight (lb/gal) [1]	14.5	16.4	16.4	16.4	16.4	16.4
Top of Plug (MD)	3,270 ft KB	2,035 ft KB	1,429 ft KB	1,177 ft KB	650 ft KB	0 ft
Bottom of Plug (MD)	3,400 ft KB	2,155 ft KB	1,539 ft KB	1,287 ft KB	750 ft KB	30 ft
Type of Cement or Other Material	CO2 compatible cement	Class H	Class H	Class H	Class H	Class H
Method of Emplacement	Circulation	Circulation	Circulation	Circulation	Circulation	Circulation
Type of Plug	Balance	Balance	Balance	Balance	Balance	Balance
New Plug?	Yes	Yes	Yes	Yes	Yes	Yes

ft^3 = cubic feet; lb/gal = pound per gallon; MD = measured depth from KB

[1] Proposed slurry density may be modified as needed due to field conditions and vendor availability

Slurry Volume (ft^3) $= \frac{ID^2}{1029.4} \times \text{plug height (ft)} \times 5.615$

CO_2-compatible Class H cement slurry yield: 1.207 ft^3/sack; Portland Class H cement slurry yield: 1.08 ft^3/sack

6.4 Notifications and Record Keeping

The procedures described above are subject to modification during execution, as necessary, for implementation of plugging operations that protect worker safety and the USDW. Significant modifications due to unforeseen circumstances will be reported to the UIC Program Director within 24 hours of occurrence during field operations and documented in the plugging report. Completed plugging forms, records, and lab information will be supplied to the regulatory agencies as required by the permit. The plugging report will be certified as accurate by ExxonMobil and the plugging contractor and will be submitted to the UIC Program Director within 60 days after plugging is completed [40 CFR 146.92(d)]. Well plugging reports, post-injection site care data (including data and information used to develop the demonstration of the

alternative post-injection site care timeframe), and the site closure report collected pursuant to the requirements in 40 CFR 146.93 (f) and (h), will be retained by ExxonMobil for 10 years following site closure. Site closure and reporting is discussed in Section 7 – Post-Injection Site Care and Site Closure Plan.

The plugging report will provide the following information:

- Results of tests to determine BHP and mechanical integrity;
- Type and number of plugs used;
- Cement type, grade, weight, and quantity of material for plugs;
- Method of cement plug emplacement; and
- Top and bottom of each cement plug.

6.5 Monitoring Wells P&A

Monitoring wells must be plugged in accordance with 40 CFR 146.93(e) to not allow movement of injection or formation fluids that could endanger USDWs. Specific monitoring wells will remain in place after injection wells have been plugged and abandoned for use in monitoring activities associated with the Post Injection Site Care and Site Closure Plan. ExxonMobil will assess the monitoring well plugging procedures prior to P&A in relation to this plan. Documentation of appropriate P&A of the monitoring wells will be submitted to the UIC Program Director in accordance with 40 CFR 146.93(f)(1).

6.5.1.1 Plugging Procedure, In-Zone Monitoring Well No. 01

The following sequence of plugging procedures are planned:





Table 6-7: Plug Details for In-Zone Monitoring Well No. 01

Plug Description	UCCZ Plug	Surface Casing Shoe Cement Plug	USDW Plug	BUQW Plug	Superior Water Quality Plug	Surface Cement Plug
Plug Number	1	2	3	4	5	6
Diameter of Boring in which Plug Will Be Placed	4.8 in.	4.8 in.	4.8 in.	4.8 in.	4.8 in.	4.8 in.
Depth to Bottom of Tubing or Drill Pipe or Mechanical Base (MD)	3,400 ft KB	2,183 ft KB	1,539 ft KB	1,287 ft KB	750 ft KB	30 ft
Sacks of Cement to be Used (each plug)	14	14	13	13	12	4
Slurry Volume to be Pumped (ft^3)	16	15	14	14	13	4
Slurry Weight (lb/gal) [1]	14.5	16.4	16.4	16.4	16.4	16.4
Top of Plug (MD)	3,270 ft KB	2,063 ft KB	1,429 ft KB	1,177 ft KB	650 ft KB	0 ft
Bottom of Plug (MD)	3,400 ft KB	2,183 ft KB	1,539 ft KB	1,287 ft KB	750 ft KB	30 ft
Type of Cement or Other Material	CO2 compatible cement	Class H	Class H	Class H	Class H	Class H
Method of Emplacement	Circulation	Circulation	Circulation	Circulation	Circulation	Circulation
Type of Plug	Balance	Balance	Balance	Balance	Balance	Balance
New Plug?	Yes	Yes	Yes	Yes	Yes	Yes

ft^3 = cubic feet; lb/gal = pound per gallon; MD = measured depth from KB

[1] Proposed slurry density may be modified as needed due to field conditions and vendor availability

Slurry Volume (ft^3) $= \frac{ID^2}{1029.4} \times \text{plug height (ft)} \times 5.615$

Plug Description	UCCZ Plug	Surface Casing Shoe Cement Plug	USDW Plug	BUQW Plug	Superior Water Quality Plug	Surface Cement Plug
CO_2-compatible Class H cement slurry yield: 1.207 ft^3/sack; Portland Class H cement slurry yield: 1.08 ft^3/sack						

6.5.1.2 Plugging Procedure, Above-Zone Monitoring Well No. 01 (Bead Farm Co. #1)

The following sequence of plugging procedures are planned:



Table 6-8: Plug Details for Above-Zone Monitoring Well No. 01 (Bead Farm Co. #1)

Plug Description	UCCZ Plug	Surface Casing Shoe Cement Plug	USDW Plug	BUQW Plug	Superior Water Quality Plug	Surface Cement Plug
Plug Number	1	2	3	4	5	6
Diameter of Boring in which Plug Will Be Placed	8.5 in.	8.5 in.	8.5 in.	8.5 in.	8.5 in.	8.5 in.
Depth to Bottom of Tubing or Drill Pipe or Mechanical Base (MD)	3,527 ft KB	2,225 ft KB	1,539 ft KB	1,287 ft KB	750 ft KB	30 ft
Sacks of Cement to be Used (each plug)	64	44	41	41	37	11
Slurry Volume to be Pumped (ft^3)	77	47	43	43	39	12
Slurry Weight (lb/gal) [1]	14.5	16.4	16.4	16.4	16.4	16.4
Top of Plug (MD)	3,332 ft KB	2,105 ft KB	1,429 ft KB	1,177 ft KB	650 ft KB	0 ft
Bottom of Plug (MD)	3,527 ft KB	2,225 ft KB	1,539 ft KB	1,287 ft KB	750 ft KB	30 ft
Type of Cement or Other Material	CO2 compatible cement	Class H	Class H	Class H	Class H	Class H
Method of Emplacement	Circulation	Circulation	Circulation	Circulation	Circulation	Circulation
Type of Plug	Balance	Balance	Balance	Balance	Balance	Balance
New Plug?	No	Yes	Yes	Yes	Yes	Yes

ft^3 = cubic feet; lb/gal = pound per gallon; MD = measured depth from KB

[1] Proposed slurry density may be modified as needed due to field conditions and vendor availability

Slurry Volume (ft^3) $= \frac{ID^2}{1029.4} \times \text{plug height (ft)} \times 5.615$

CO_2-compatible Class H cement slurry yield: 1.207 ft^3/sack; Portland Class H cement slurry yield: 1.08 ft^3/sack

6.6 Amendments to the P&A Plan

The Plugging Plan will be amended to account for changes in conditions that trigger modification to the Area of Review. ExxonMobil will inquire with the UIC Program Director to confirm whether such changes in condition warrant amendments to the Plugging Plan. Approval for revisions to the Injection Well Plugging Plan will be requested from the UIC Program Director. Any approved changes to the Plugging Plan will be incorporated in the permit and are subject to permit modifications. Notifications of intent to plug will be provided to the UIC Program Director at least 60 days prior to conducting the plugging activity [40 CFR 146.92(c)].

Underground Injection Control – Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

SECTION 7 – POST-INJECTION SITE CARE AND SITE CLOSURE PLAN

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage LLC

May 2025

SECTION 7 – POST-INJECTION SITE CARE AND SITE CLOSURE PLAN

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7.0 Post-Injection Site Care and Site Closure Plan

ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) is submitting this Underground Injection Control Class VI Permit Application (Application) to the U.S. Environmental Protection Agency (EPA) for the Rose Cabon Capture and Storage Project (Project). ExxonMobil is undertaking the Project in Jefferson County, Texas to sequester a maximum of 5 million metric tonnes per annum of carbon dioxide (CO2) using three injection wells over an injection period of up to 13 years. The predicted total CO2 storage is 53 million metric tonnes. This Post-Injection Site Care (PISC) and Site Closure Plan is submitted in compliance with the requirements of the Code of Federal Regulations, Title 40, Section 146.93 [40 CFR 146.93] and Texas Administrative Code, Part 1, Title 16, Chapter 5.

The PISC Plan describes the activities that will occur once injection operations have ceased, and the Project moves into maintaining a non-endangerment condition for underground sources of drinking water (USDW). The Site Closure Plan will be implemented once ExxonMobil demonstrates to the Underground Injection Control (UIC) Program Manager that no additional monitoring is required to demonstrate protection of USDW and that the testing and monitoring system can be dismantled. ExxonMobil's strategy for PISC monitoring is based on the same systems and processes as described in Section 5 – Testing and Monitoring Plan of the Application. The major monitoring elements include continued measurements of the CO2 plume and pressure front location, monitoring above upper composite confining zone (UCCZ) groundwater as well as USDW. The data collected from this activity will be used to confirm compliance with the water quality objectives for the Project and generate information needed to support the final non-endangerment demonstration and subsequent site closure. The end of the Project comes when the closure activities have been documented and approved by the UIC Program Director.

7.1 Objectives

The PISC and Site Closure Plan have been developed to meet the following objectives as outlined in 40 CFR 146.93:

- Describe the pressure differential between pre-injection and predicted post-injection pressures in the injection zones as well as the predicted positions of the CO2 plume and associated pressure front at site closure;
- Describe the post-injection monitoring locations, methods, and proposed frequencies to demonstrate non-endangerment to USDW over the timeframe of the PISC;
- Identify the pre-closure, plugging, and site-restoration steps to achieve approval for site closure; and
- Outline the documentation and recordkeeping practices that will provide the information for decision-making purposes.

ExxonMobil will not cease post-injection monitoring until the non-endangerment demonstration pursuant to 40 CFR 146.93(b)(3) has been approved by the UIC Program Director. Pursuant to 40 CFR 146.93(b)(1), the default PISC monitoring timeframe is 50 years after cessation of injection. ExxonMobil will monitor groundwater quality and track the position of the CO2 plume and pressure front for 50 years after cessation of injection unless a lesser period of time is approved by the UIC Program Director. Once the non-endangerment demonstration has been

approved, ExxonMobil will plug the monitoring wells, restore each well pad to the landowner's agreed-upon condition, and submit a Site Closure Report to the UIC Program Director.

7.2 Calculation of Pre- and Post-Injection Pressure Differentials

As described in 40 CFR 146.93(a)(2)(i), the Class VI non-endangerment demonstration will establish that pressure has declined to a level that no longer poses potential endangerment of USDW. For the purposes of this section, ExxonMobil evaluated the pressure differentials by comparing the pre-operating pressure with the post-injection pressure differentials predicted by the plume model. The predicted pressure differential between pre-injection and the modeled post-injection pressures are favorable, showing a steep and continuous decline in pressure toward pre-operational baseline conditions. The primary mechanisms responsible for the anticipated pressure decay rates are the injection sequencing plan, the geological conditions of the injection zones (e.g., net sand thickness, permeability, porosity) and confining zones, and the projected CO2 storage volume for the Project site.

A staged injection sequence is planned for the injection wells to optimize the storage of CO2 in the three Fleming Sand injection intervals (from uppermost to lowermost Fleming 1, Fleming 2, and Fleming 3) and the Upper Frio injection interval. Section 3 – Area of Review and Corrective Action Plan and Section 4 – Well Construction Plan and Operating Conditions of the application provide detailed discussions of the injection sequencing strategy. Figure 7-1 summarizes the injection sequence schedule for the proposed 13-year injection period. The actual injection period will depend on the issuance of the permits for each injection well.

Figure 7-1: Proposed Injection Interval Schedule

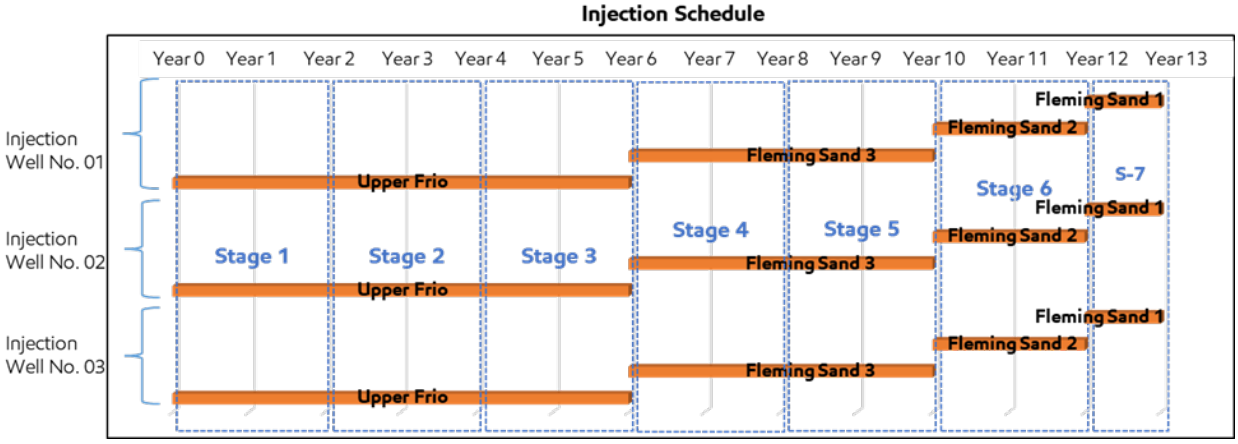
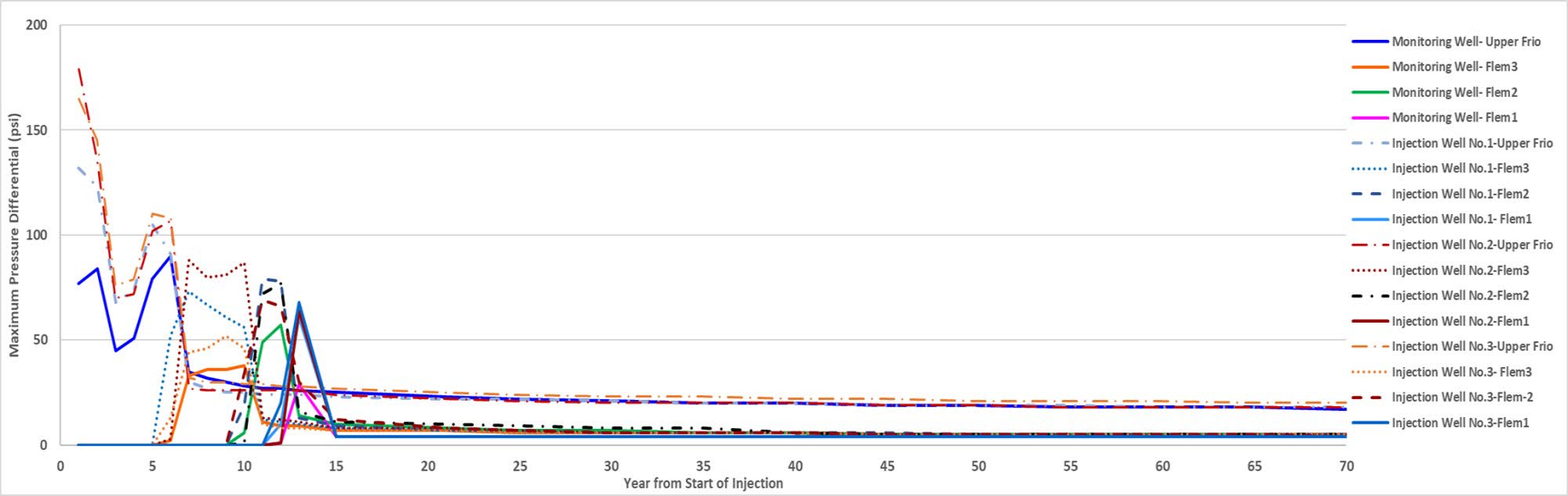


Table 7-1 provides the model-predicted maximum pressure differential and the change in injection pressures in each injection interval over time pursuant to 40 CFR 146.93(a)(2)(i). Figure 7-2 presents a graphical representation of the pressure differential data provided in Table 7-1.

Table 7-1: Maximum Pressure Differential by Year for Injection Wells No. 01, No. 02, and No. 03 and the In-Zone Monitoring Well



Figure 7-2: Maximum Pressure Differential Over Time for Injection Wells and Monitoring Well at Rose Cabon Capture and Storage Project



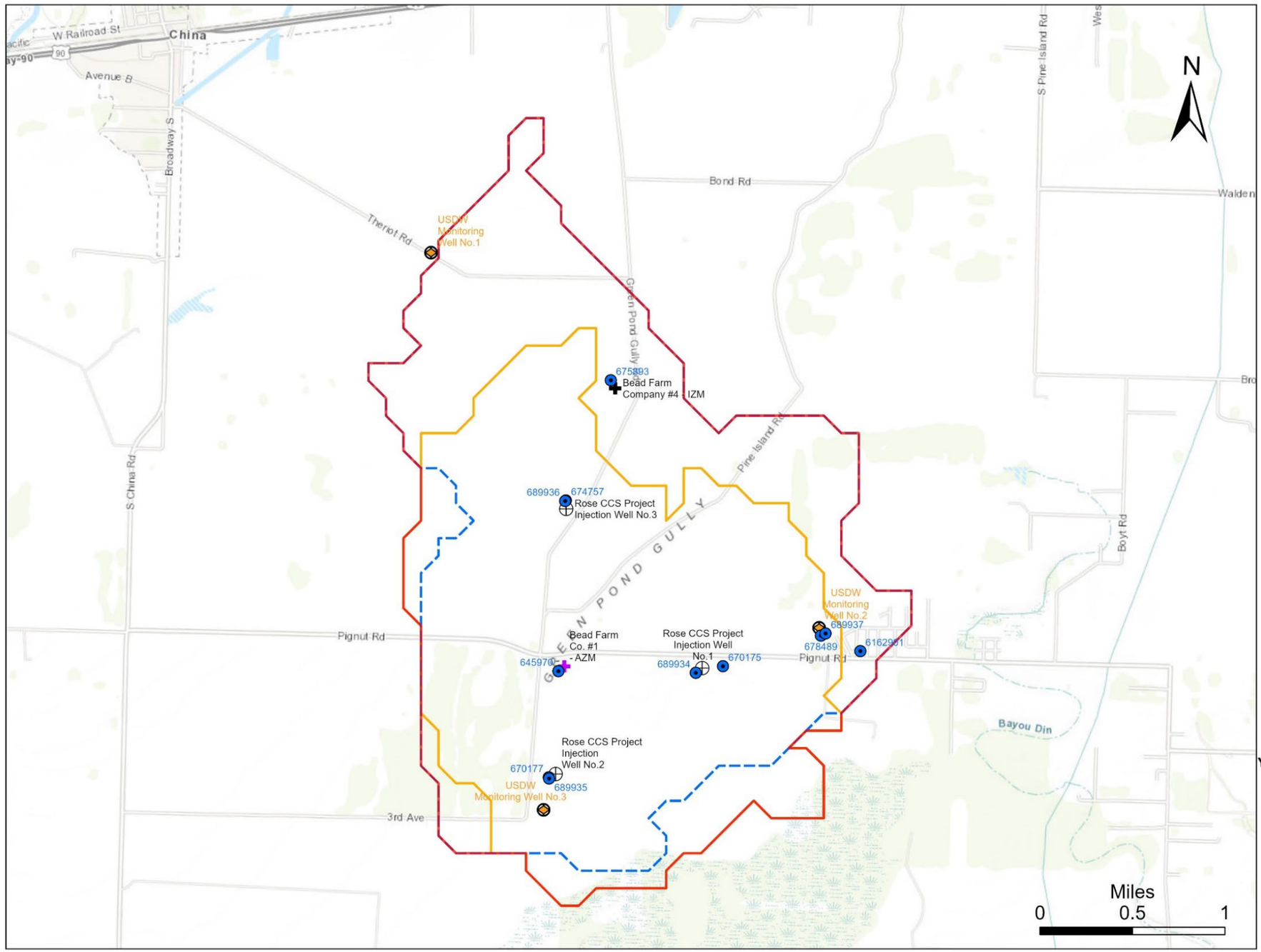
7.3 Predicted Position of the CO2 Plume and Pressure Front at Site Closure

Pursuant to 40 CFR 146.93(a)(2)(ii), the Area of Review (AoR) was delineated using computational modeling that accounts for all phases of CO2 (e.g., supercritical, dissolved, etc.) under proposed operational conditions. The AoR consists of both the CO2 plume and the extent of the pressure front. The following discussion provides the predicted evolution of both the CO2 plume and pressure front throughout the course of the 50-year PISC timeframe.

Figure 7-3a shows the extent of the AoR and its subcomponents at 40 years from start of injection (13 years of injection and 27 years from cessation of injection). Based on the model, the CO2 plume stabilization is predicted to occur 39 years after injection starts as described in Section 3.7.1 – Extent of CO2 Plume. Maximum pressure differentials occur during active injection phase and dissipate rapidly post-injection. These features are consistent with plume stabilization and protection of USDW. The CO2 plume at year 40 is indicated by the blue polygon, based on the maximum extent of any injection interval. The maximum extent of the pressure front is shown using the orange dashed line. This line represents a composite of the maximum extent of the pressure front at any point in time for the four injection intervals during all seven stages of injection operation. Note this maximum pressure front occurs during active injection (first 13 years). By year 40, the field pressure differential has fallen well below critical pressure in all zones.

Figure 7-3b provides an additional view of predicted CO2 plume at year 63 (50 years post-injection), compared to year 40 (27 years post-injection).

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Legend

- Area of Review
- Injection Wells
- Bead Farm Co. #1 - AZM
- Bead Farm Company #4 - IZM
- USDW Monitoring Well
- Water Well
- Maximum Pressure Front
- CO2 Stabilized Plume

Figure 7-3 (a)
Extent of Stabilized CO2 Plume at Year 40 and Maximum Pressure Front during Active Injection

Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

a

ExxonMobil

Claimed as PBI

7.4 Post-Injection Monitoring Plan

PISC monitoring is required by 40 CFR 146.93(b) to demonstrate that USDW is not endangered during the post-injection phase of the Project. Much like the operational phase, direct and indirect forms of monitoring will be used to track the evolution of the CO2 plume and pressure front after cessation of CO2 injection. The strategy for the Post-Injection Monitoring Plan is to rely on a core set of monitoring locations that were established during the operational phase of the Project. The following set of core monitoring locations were assumed to be installed and monitored pursuant to the Testing and Monitoring Plan and found sufficient pursuant to the AoR reevaluation process:

- In-Zone Monitoring at Injection Wells No. 01, No. 02, and No. 03 for indirect CO2 plume monitoring;
- In-Zone Monitoring Well No. 01 located updip from the injection wells for direct and indirect in-zone monitoring ;
- Above-Zone Monitoring Well (Bead Farm Co. #1; American Petroleum Institute 4224532908) located in the middle of injection wells for above-zone monitoring interval (AZMI) fluid sampling; and
- USDW Monitoring Wells No. 01, No. 02, and No. 03 for direct monitoring of USDW.

Figure 5-4 in Section 5 – Testing and Monitoring Plan illustrates the locations of these USDW monitoring wells. In the event that additional monitoring locations are added during the course of the injection operations under the direction of the UIC Program Manager, this core set of monitoring wells will be updated to reflect the detection monitoring system found sufficient for CO2 plume and pressure front migration evaluation at the close of the injection phase of the Project.

In accordance with 40 CFR 146.93(b)(1), monitoring of the pressure front and CO2 plume will occur for at least 50 years or an alternate duration approved by the UIC Program Director. ExxonMobil is proposing a schedule to submit PISC monitoring results annually and within 30 days of the anniversary date of injection cessation [40 CFR 146.93(a)(2)(iv)].

The following discussion provides details on the elements of the PISC monitoring strategy outlined above.

7.4.1 PISC and Site Closure Plan Reviews and Amendments

As required by 40 CFR 146.93(a)(3), ExxonMobil will submit an amended PISC and Site Closure Plan or demonstrate that no amendment is needed upon cessation of injection. Amendments to the plan, or the demonstration that no revisions are necessary, will be based on monitoring data collected during injection and the most-recent AoR delineation. The plume model will continue to be updated throughout the Project using monitoring information and the AoR reevaluation process and reporting requirements.

During PISC monitoring, ExxonMobil will conduct periodic reviews to incorporate new monitoring data, changes to the site computational model that may warrant changes in PISC monitoring, and/or changes in the methodology proposed to demonstrate non-endangerment of USDW. This approach will also support the use of new technologies that may be available in the future that facilitate a higher level of performance than the existing system. Pursuant to 40 CFR

146.84(e) and as described in Section 4 – Well Construction Plan and Operating Conditions, ExxonMobil will reevaluate the AoR periodically by comparing model predictions with monitoring results. Following an AoR reevaluation process, if the AoR and Corrective Action Plan are amended, ExxonMobil will review the PISC and Site Closure Plan to determine whether any updates are needed to ensure consistency across all plans. ExxonMobil may submit an amended PISC that describes how changes to the model affect predictions of pressure dissipation, plume migration rates, CO2 trapping, and additional processes that need to be accounted for in the non-endangerment demonstration.

In accordance with 40 CFR 146.93(a)(4), at any time during the life of the Project, ExxonMobil may modify and resubmit the PISC and Site Closure Plan for the UIC Program Director's approval within 30 days of such change.

7.4.2 Monitoring Above the UCCZ and USDW

During the injection phase, periodic monitoring of groundwater quality for significant geochemical changes above the UCCZ is required by 40 CFR 146.90(d) for the purpose of detecting potential leakage through the UCCZ. As described in Section 2 – Site Characterization, the UCCZ is a thick, muddy sequence that includes the Middle Miocene Amphistegina 'B' Shale a regionally continuous, transgressive marine shale. In accordance with 40 CFR 146.93(b)(1), groundwater quality and geochemical characteristics will be monitored in the Above-Zone Monitoring Well (Bead Farm Co. #1) and in the USDW at USDW Monitoring Wells No. 01, No. 02, and No. 03 during the post-injection period.

ExxonMobil's strategy for monitoring groundwater above the UCCZ is a risk-based approach correlated to modeled CO2 plume and injection zone characteristics. By the time the PISC monitoring program is initiated, the risk mitigating effects of injection sequence plan, the operating strategy, and corrective actions taken on artificial penetrations will likely have demonstrated protection of USDW throughout the operational phase of the Project. The list of analyses to be performed at these monitoring wells is summarized in Table 7-2 based on the same approach used for the operational phase of the Project.

Table 7-3 provides a summary of indirect monitoring technologies to be used for above-zone CO2 plume and pressure front monitoring during the PISC phase of the Project. This monitoring strategy is consistent with the details and rationale provided in Section 5 – Testing and Monitoring Plan of this application. The results of the monitoring activities will be submitted in the annual report for the year in which they occur and within 30 days of the anniversary date of injection cessation or through an alternate agreed schedule with the UIC Program Director.

Table 7-2: Direct Above-Zone Monitoring and USDW Sampling and Analysis Program

Target Formation	Monitoring Activity	Monitoring Location(s)	Frequency [1]	Geochemical Analyses
USDW (Chicot Aquifer)	Water Level Gauging and Collection of Fluid Samples	USDW Monitoring Wells No. 01, No. 02, and No. 03	Annual	Total dissolved solids, alkalinity, electrical conductivity, temperature, pH, Gas composition (CO2, CH4, O2, N2), Dissolved cations (Ba, Cd, Ca, Cr, Co, Cu,
First Laterally Continuous	Collection of Fluid Samples	Above-Zone Monitoring Well	Annual	

Target Formation	Monitoring Activity	Monitoring Location(s)	Frequency [1]	Geochemical Analyses
Permeable Formation above UCCZ		(Bead Farm Co. #1)		Fe, Pb, Li, Mg, Mn, Mo, Ni, P, K, Si, Na, Sr, V, Zn) Dissolved anions (HCO3, B(OH)4, Br, CO3, Cl, F, I, NO3, NO2, PO4, SO4, S)

Ba = barium; Br = bromine; Ca = calcium; CH4 = methane; Cl = chlorine; F = fluorine; Fe = iron; HCO3 = bicarbonate; Mg = magnesium; Mn = manganese; N2 = Nitrogen; Na = sodium; O2 = oxygen; SO4 = sulfate

[1] The word “continuous” as used to express the frequency of measures collected during monitoring equipment operation is defined as the instrument’s normal data collection frequency as defined by the manufacturing. The frequency will vary by instrument and application. Measurements that are collected “continuously” will be averaged across a reasonable and appropriate time interval for reporting the detection monitoring results during the operational phase of the Project.

Table 7-3: Indirect Above-Zone Monitoring Program

Testing/Monitoring Activity	Frequency	Reporting Schedule	Comment
Indirect Plume Monitoring by Time-Lapse Seismic Surveys or Equivalent Technologies	Survey Event #4 will occur at the end of operational period, a predicted total of 13 years after the start of operation. Contingent additional survey events during PISC phase to be determined based on the results from direct and indirect monitoring and model prediction.	Within 30 days after time-lapse seismic processing and interpretation has finished	The frequency and method of indirect plume monitoring will be determined in conjunction with the UIC Director

The analytical methods and quality assurance/quality control measures for collecting and analysis of fluid samples discussed in Section 5 – Testing and Monitoring Plan and will apply to the data collection program of the PISC, as appropriate.

7.4.3 In-Zone CO2 Plume and Pressure Front Tracking

ExxonMobil proposes to use direct and indirect methods to track the extent of the CO2 plume and pressure front in the injection zone during the PISC period. Direct monitoring in the injection zone includes continuous pressure and temperature measurements in the final injection zone for Injection Wells No. 01, No. 02, No. 03, and in In-Zone Monitoring Well No. 01. Indirect monitoring technologies include geophysical surveys to indirectly monitor subsurface conditions. By the start of the PISC phase of the Project, the direct and indirect monitoring activities will have been used for approximately 13 years and will be a proven set of monitoring technologies for detection monitoring of CO2 plume and brine crossflow potential.

Table 7-4 describes the proposed CO2 and pressure plume tracking methods for the PISC Plan. The water quality and geochemical parameters to be analyzed are presented in Table 7-5, consistent with Section 5 – Testing and Monitoring Plan where additional information on the monitoring methods described and how deviations would be identified.

Table 7-4: Direct and Indirect In-Zone Monitoring Program for PISC

Monitoring Element	Strategy
Time Period	Immediately following and for up to 50 years from cessation of injection operations.
Monitored Locations, Conditions, and Frequency	• Injection Wells No. 01, No. 02, and No. 03: continuous wellhead and borehole pressure at the 7th Stage injection interval and temperature in the injection zone. • In-Zone Monitoring Well No. 01: continuous pressure and temperature throughout the injection zone. • Above-Zone Monitoring Well (Bead Farm Co. #1): Annual AZMI fluid samples for water quality and geochemical parameters. • USDW Monitoring Wells No. 01, No. 02, No. 03: annual fluid samples for water quality and geochemical parameters. • Time-lapse seismic surveys or equivalent technologies for the AoR from surface to base of Upper Frio Sand 2. Survey Event #4 will occur at the end of operational period, a predicted total of 13 years after the start of operation. The need for additional surface seismic survey events during the PISC phase of the Project will be determined based on the results from direct and indirect monitoring and model prediction.
Planned Changes in Monitoring Techniques	None. The model-predicted rapid decrease in CO2 plume movement and pressure significantly reduces the potential for USDW endangerment following injection and eliminated need for additional monitoring.
Triggers	Table 3-21 in Section 3 – Area of Review and Corrective Action Plan provides a list of triggers for the AoR reevaluation process. Those triggers are applicable to the monitoring program.

Table 7-5: USDW and Above-Zone Monitoring Well Monitoring and Sampling Program During the PISC Phase

Monitoring Well	Frequency	Parameter/Analyte
Above-Zone Monitoring Well (Bead Farm Co. #1)	Annually	• Total dissolved solids

Monitoring Well	Frequency	Parameter/Analyte
USDW Monitoring Wells No. 01, No. 02, No. 03		• Alkalinity • Electrical Conductivity • Temperature • pH • Gas composition (CO2, CH4, O2, N2) • Dissolved cations (Ba, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, P, K, Si, Na, Sr, V, Zn) • Dissolved anions (HCO3, B(OH)4, Br, CO3, Cl, F, I, NO3, NO2, PO4, SO4, S)
Ba = barium; Br = bromine; Ca = calcium; CH4 = methane; Cl = chlorine; F = fluorine; Fe = iron; HCO3 = bicarbonate; Mg = magnesium; Mn = manganese; N2 = nitrogen; Na = sodium; O2 = oxygen; SO4 = sulfate		

7.4.4 Submitting PISC Monitoring Results

In accordance with 40 CFR 146.93(a)(2)(iv), ExxonMobil will submit PISC monitoring data to the UIC Program Director in annual reports within 30 days following the anniversary of the date that injection ceases. The annual reports will contain information and data generated during the reporting period, such as:

- A list of monitoring events performed during the reporting period and the associated dates;
- A brief description of sampling/testing/analytical locations, elevations/depths, equipment, and procedures, indicating whether (and why) departures from the procedures specified in the PISC and Site Closure Plan occurred;
- Changes to the monitoring program that took place during the reporting period (e.g., repair to monitoring wells, implementation of approved changes in the frequency of monitoring activities based on criteria established in the PISC and Site Closure Plan and approval of UIC Program Director);
- Synthesis and interpretation of the results that describe trends in parameter values or lack of trends, statistical tests performed, alignment between actual and plume model predictions, the appearance of anomalous or unexpected results, and progress toward attaining the EPA and Railroad Commission of Texas (RRC) criteria for non-endangerment;
- Map(s) and cross section(s) showing the AoR, monitoring locations, and the interpreted extent of the separate-phase CO2 plume and the pressure front; and
- Any recommended changes to the PISC and Site Closure Plan to continue protection of USDWs.

7.5 Demonstration of Non-Endangerment of USDW

Prior to the approval of the site closure authorization and in accordance with 40 CFR 146.93(b)(2) and 40 CFR 146.93(b)(3), ExxonMobil will provide documentation to assess the potential for USDW to be at risk of endangerment from the CO2 plume at the end of the PISC phase of the Project. The non-endangerment demonstration will be based on monitoring data and a demonstration that the structure of the confining zones, combined with the geochemical

conditions of the subsurface, have effectively permanently sequestered the stored CO2. This information will be used to demonstrate that additional monitoring is not needed to protect USDW and the Project has met the compliance obligations to receiving authorization for site closure.

This demonstration will be in the form of a detailed report submitted to the UIC Program Director that synthesizes site- and Project-specific information and demonstrates a current understanding of system behavior at the time of the non-endangerment demonstration. The following subsections outline the type of information to be presented in the non-endangerment demonstration report.

ExxonMobil will engage the UIC Program Director as soon as the available data are aligned with the criteria for site closure, which may ultimately be less than the default PISC duration of 50 years pursuant to 40 CFR 146.93(b)(2) and 40 CFR 146.93(c).

7.5.1 Introduction and Overview for Non-Endangerment Demonstration

A summary of relevant background information will be provided in the introduction section, including the operational history of the injection Project, the date of the non-endangerment demonstration relative to the post-injection period outlined in this PISC and Site Closure Plan, and a general overview of how monitoring and modeling results will be used together to support a demonstration of USDW non-endangerment.

7.5.2 Summary of Existing Monitoring Data

The monitoring data collected throughout the Project's lifecycle will be summarized and used to describe how the UCCZ functioned as a barrier to mitigate endangerment of USDW and how the CO2 is effectively trapped in the injection zones. The non-endangerment demonstration will include a summary of previous monitoring data collected at the site, pursuant to the details in Section 4 – Well Construction Plan and Operating Conditions, and Section 5 – Testing and Monitoring Plan of this application as well as the PISC and Site Closure Plan. Data submittals will be in a format acceptable to the UIC Program Director [40 CFR 146.91(e)] and will include a narrative explanation of monitoring activities, including the dates of all monitoring events, changes to the monitoring program over time, and an explanation of the monitoring infrastructure that has existed at the site. The data will be compared with baseline data collected during site characterization, including the use of statistical analyses as warranted [40 CFR 146.82(a)(6) and 146.87(d)(3)] to assess trends in key parameters that support the proposal for site closure.

7.5.3 Summary of Computational Modeling History

A series of data sources detailed in Section 5 – Testing and Monitoring Plan of this application will be used to update the computational model at least once every five years, more frequently if warranted. The following measured data will be utilized to update the computational model to demonstrate non-endangerment:

- In-zone temperature and pressure data;
- Injection rate and volume data;
- CO2 plume location based on indirect geophysical monitoring; and

- AZMI data regarding the performance of the UCCZ.

The procedure used to reevaluate the AoR will be based upon the data collected between reevaluations and the well conditions at the time of reevaluation. The post-injection data will include historical injection rates, pressures, pressure fall-off, and historical operational parameters of the three injection wells. ExxonMobil will rely on a process of history matching the plume model results with the actual monitoring data. The measured data will be used as a calibration point for the plume model and the input parameters adjusted to provide a reasonable match between the two data sets. Through this or a similar process, ExxonMobil will provide a validation of the model performance for the CO2 plume and pressure front.

7.5.4 Evaluation of Reservoir Pressure

The non-endangerment demonstration will include an evaluation of the residual pressure and the potential for future endangerment of USDW continued trends in pressure dissipation. Information will be provided to describe how the pressure and buoyancy effects on plume and pressure migration decayed over time and how the residual levels comply with the requirements for non-endangerment. This evaluation will consider the most-recent AoR delineation/modeling results and pressure monitoring data. The same model that supported the delineation of the AoR or similar approved model by UIC Program Manager will be used for this modeling as it will be verified (or calibrated) by actual monitoring and operational data via AoR reevaluations.

7.5.5 Evaluation of the CO2 Plume

The evaluation of the CO2 plume will evaluate the characteristics of the gas-phase CO2 plume, the aqueous-phase CO2 plume, and the dissolved-phase CO2 plume, as appropriate. The evaluation of the potential CO2 plumes will rely on monitoring data including geochemical and geophysical analyses and the most-recent AoR modeling results. Direct measurements of temperature and pressure of CO2 in the injection zone as well as the results of geophysical measurements will be used to confirm plume location and demonstrate plume migration rates. A comparison of monitoring data with the most-recent modeling results will also be used to corroborate model predictions of the phase-state of CO2 and the degree and processes of CO2 trapping over time.

7.5.6 Evaluation of Emergencies or Other Events

A key feature of the AoR is how few artificial penetrations were identified and of those, only two penetrated the UCCZ. The artificial penetration of the UCCZ will be re-entered, and a corrosion resistant cement plug will be placed to restore the integrity of the UCCZ, and additional cement plugs will be set to protect USDW from crossflow potential. If any subsequent artificial penetrations are discovered to have a potential to threaten USDW, they will have been remediated using the same procedures such that no artificial penetrations of concern remain at the time of site closure.

The data and evaluation methods specified pursuant to the requirements of Section 5 – Testing and Monitoring Plan as well as the PISC Plan provide the basis for demonstrating that no future endangerment of USDW is likely to occur.

7.6 Site Closure Plan

ExxonMobil will conduct site closure activities to meet the requirements of 40 CFR 146.93(d) through (h) as described below. ExxonMobil will submit a final Site Closure Plan and notify the

UIC Program Director at least 120 days prior of its intent to close the site. Once the UIC Program Director has approved closure of the site, ExxonMobil will plug all injection and monitoring wells and submit a site closure report to the EPA and RRC. The activities, as described below, represent the planned activities based on information provided to EPA. The actual Site Closure Plan may employ different methods and procedures. A final Site Closure Plan will be submitted to the UIC Program Director for approval with the notification of the intent to close the site. Additionally, ExxonMobil will record a notation on the deed to the site that the land has been used to sequester CO2.

Site closure activities will also include removing all surface equipment and restoring the site to its prior land surface condition.

7.6.1 Pre-Closure

In accordance with 40 CFR 146.93(d), a notice of intent to close the site will be submitted to the UIC Director at least 120 days prior to the commencement of closure operations. If any changes are made to the original PISC and Site Closure Plan, a revised plan will also be submitted. Relevant notifications and applications, such as plugging requests, will be submitted and approved by the appropriate agency prior to commencing such activities.

The site closure notice submitted to the UIC Program Director will include the following:

- Facility information, name, and location;
- A list of contact personnel for allowing timely direct communication to resolve any pressing issues; and
- A projected closure date, no less than 120 days following the site closure notification submission, unless the UIC Program Director has approved a different period prior to notice submission.

7.6.2 Plugging Activities

Injection Wells No. 01, No. 02, and No. 03 will be plugged as discussed in Section 6 – Injection Well Plugging Plan. After injection in the injection wells ceases and after the appropriate post-injection monitoring period is complete, the monitoring wells will be plugged and abandoned to meet the requirements at 40 CFR 146.92 and in compliance with applicable state requirements. The plugging procedure and materials will be designed to mitigate fluid movement and protect USDW. Prior to plugging the wells, the necessary procedural revisions to address new information will be submitted to the UIC Program Director for review and approval. The final plugging plans will be submitted to the UIC Program Director no later than 60 days prior to plugging of the wells.

Following receipt of the approved plugging plans, wells below the lowermost USDW and above the UCCZ will be logged and pressure tested to ensure mechanical integrity. If a loss of mechanical integrity is discovered, it will be repaired prior to proceeding with plugging operations. The casing in these wells will be closed in place and it will not be retrieved at abandonment. A combination of permanent packers with plugs and cement on top and cement plugs will be set to plug the wells. All casing strings will be cut at least three feet below ground level. A steel plate, with the required permit information, will be welded to the top of the casing, to the extent required by State of Texas requirements.

7.6.3 Site Restoration

Once the injection and monitoring wells are plugged and abandoned, the surface equipment will be decommissioned and removed from the well site. The well site will be restored to a condition agreed upon with the landowner.

7.6.4 Documentation of Site Closure

Within 90 days of site closure, a final report will be submitted to the UIC Program Director per the requirements of 40 CFR 146.93(f) and will include the following:

- Documentation of appropriate injection and monitoring well plugging, including a copy of the survey plats [40 CFR 146.93(f)(1)];
- The survey plat will indicate the locations of the injection wells relative to permanently surveyed benchmarks and will include the location(s) of the monitoring well(s);
- Documentation of well-plugging report will be filed with the RRC [40 CFR 146.93(f)(2)];
- Post-injection monitoring records will be summarized; and
- Records of the nature, composition, and volume of the CO2 stream for the injection period will be summarized [40 CFR 146.93(f)(3)].

Pursuant to 40 CFR 146.93(g), a record of notation in the Project facilities and infrastructure will be filed on the property deed to provide notice to landowners of the following:

- The land use to sequester CO2;
- The name of the state agency with which the survey plat was filed (RRC) and the EPA Regional Office (Region VI) at which it was submitted; and
- The total volume of CO2 injected, the injection zones into which it was injected, and the period over which injection occurred.

As required by 40 CFR 146.93(h), ExxonMobil will retain all records collected during the PISC period for 10 years following site closure. At the end of the retention period, ExxonMobil will deliver all records to the UIC Program Director for retention at a location designated by the UIC Director for that purpose.

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Underground Injection Control – Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

SECTION 8 – EMERGENCY AND REMEDIAL RESPONSE PLAN

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage LLC

May 2025

SECTION 8 – EMERGENCY AND REMEDIAL RESPONSE PLAN

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Appendix G – Emergency and Remedial Response Plan Files

Appendix G-1: FEMA Flood Zone Hazards Map for Rose Project CCS Injection Wells No. 01 and 02

Appendix G-2: FEMA Flood Zone Hazards Map for Rose Project CCS Injection Well No. 03

Appendix G-3: Integrated Contingency Plan

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8.0 Emergency and Remedial Response Plan

ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) is submitting this Underground Injection Control (UIC) Class VI Permit to Convert Application (Application) to the U.S. Environmental Protection Agency (EPA) for the Rose Carbon Capture and Storage Project (Project). ExxonMobil is undertaking the Project in Jefferson County, Texas to sequester a maximum of 5 million metric tonnes per annum of carbon dioxide (CO_2) using three injection wells over an injection period of up to 13 years. The predicted total CO_2 storage is 53 million metric tonnes. This Emergency and Remedial Response Plan (ERRP) is submitted in compliance with the requirements of the Code of Federal Regulations, Title 40, Section 146.94 [40 CFR 146.94]. Under 40 CFR 146.90(g), the actions described in the ERRP are to be implemented immediately to address an event where the movement of the injection fluid or formation fluid endangers underground sources of drinking water (USDW). ExxonMobil prepared this ERRP to provide both the scope of actions to be taken and the schedule under which the actions would be implemented.

ExxonMobil has already created a number of engineering design and planning safeguards to reduce the potential for the occurrence of an emergency and remedial response event. These steps are based on ExxonMobil's global experience and expertise with risk management in site selection, well drilling and completion, and reservoir operations. The risk management approach is evident in the preparation of sections of this UIC Application. Section 2 – Site Characterization describes how the geologic setting is favorable to safe CO_2 sequestration because of the favorable injection zone and confining zone characteristics that exist at the site. Section 3 – Area of Review and Corrective Action describes how the CO_2 plume and pressure front are predicted to be confined to the injection zone and how pressure will be managed to reduce the potential for leakage to USDWs. Two artificial penetrations through the confining zones will be remediated appropriately to safeguard USDWs within the Area of Review (AoR) before operations commence. Section 4 – Well Construction Plan and Operating Conditions describes how the well design process and operating controls for mechanical integrity and pressure control to maintain a high level of risk reduction for the Project. Lastly, Section 5 – Testing and Monitoring Plan, provides the data acquisition plan for tracking the CO_2 plume and brine pressure front to assess compliance with control and containment requirements.

The purpose of this section is to provide the elements of the risk management process undertaken for the Project so that the UIC Program Director can ultimately approve the remedial and response actions in advance. Once approved, ExxonMobil will be prepared to implement the actions necessary to facilitate and expedite response efforts for the possibility of a leak occurring from the injection zone. The ERRP will apply over the life of the Project, including throughout the post-injection site care period [40 CFR 146.94(a)].

8.1 Objectives

The ERRP identifies a set of hypothetical potential risk scenarios under which there may be an endangerment to USDWs and the actions to be taken to mitigate such risk. The objectives of the ERRP are aligned with the requirements of 40 CFR 146.94, which include:

- Identify potential risk scenarios and adverse events that could impact USDW in the AoR. The assessment focuses on those events that were found to have a combined probability and consequence that makes them more likely to have an impact than other factors.

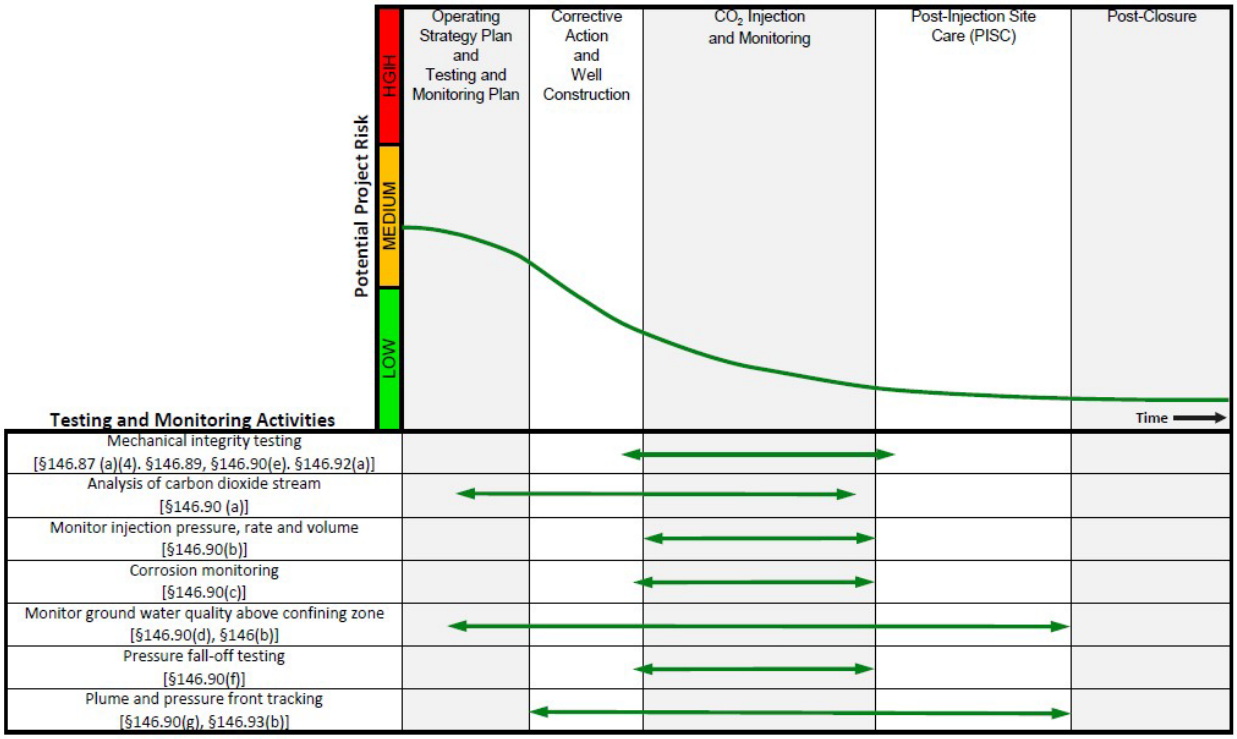
- Provide a description of the response actions necessary to reduce the potential consequences to USDWs. For each scenario considered to be of material concern, describe the anticipated severity of the event, the phase during which the event could occur (i.e., construction, injection and/or post-injection phases), the proposed avoidance measures, what methods will detect the loss of containment or control, the response actions, notification requirements, and personnel and equipment that would be employed to mitigate the risk; and
- Provide contact information for response personnel, a communications plan, and a description of staff training and exercise procedures.

8.2 Overview of Risk Management Process

ExxonMobil took the findings from the site characterization, AoR, and corrective action sections of the Application and identified hypothetical risk scenarios that could pose a potential threat to USDWs in the event of occurrence. ExxonMobil's risk assessment process was used to estimate the probability and consequence of each risk scenario based on the experience and judgment of the risk subject matter experts for the Project. The list was sorted from the most probable and consequential risk scenario to the least probable and consequential scenarios so that the critical scenarios and the response actions to be undertaken could be identified.

As shown in Figure 8-1 below, the maximum anticipated risk level for the Project, including the combination of the selected risk scenarios for the ERRP, is within the medium risk category. As mentioned above, several risk management steps were already taken to address the potential for CO2 or brine migration to occur. ExxonMobil's Integrated Contingency Plan is provided in Appendix G.

Figure 8-1: Summary of the Risk Assessment Process for the Lifecycle of the Project.



As shown in Figure 8-1, potential risk is at its maximum during the initial investigation and characterization of the Project site because artificial penetrations, fractures, and faults were identified in the confining zone. The potential for these features in the upper composite confining zone (UCCZ) to become a migration pathway for a release of CO2 were mitigated by planning for the following actions described in the Application:

- Artificial penetrations through the UCCZ will be re-abandoned to restore containment integrity at each artificial penetration location where the potential for elevated crossflow risk was identified;
- The maximum injection pressure will be maintained below the potential hydraulic fracturing or activation pressure of a natural fault to mitigate the potential for CO2/brine leaks through seal(s) due to mechanical fracturing or migration of CO2/brine along faults;
- State-of-the-art injection well and monitoring well construction methods and mechanical integrity testing (MIT) will be employed to reduce the potential for the loss of internal or external mechanical integrity, which could potentially release CO2 to USDWs or the atmosphere;
- The composition of the injectate stream will be managed and monitored such that unexpected reactions with the potential to impact containment are mitigated;
- CO2 plume and pressure front tracking will be undertaken using a combination of direct and indirect measurements and reported semiannual for review and consideration in AoR reevaluations, at a minimum frequency of every five years; and

- The predictive reservoir modeling will be calibrated and verified using monitoring data to identify the potential for the CO2 plume and pressure front to encounter artificial penetrations that have the potential for CO2 or brine crossflow from the injection intervals to the lowermost USDW and take preventive measures before such an event could occur.

8.3 Identification of Resources/Infrastructure in Area of Review

Figure 8-2 provides an illustration of the land use within and surrounding the AoR. As shown, the land use and resources/infrastructure are primarily related to oil and gas exploration and production, agricultural crop production, and undeveloped rural acreage with some residential development. The infrastructure development is primarily in the form of county roads and power transmission lines to service the few developed areas.

The water resources in the vicinity of the Project that may be affected by a CO2 or brine leakage event that could endanger USDW include water wells completed in the Chicot and Evangeline Aquifers Claimed as PBI [redacted]

A total of two water wells were reported to be present within the AoR. A plugged/destroyed water well (State Well Number 6162901) was reportedly located 1.5 miles east of Injection Well No. 01. Another in-use water well (State Well Number 645970) is collocated at the Bead Farm Co. #1 well pad.

As shown on Figure 8-2, one water conveyance canal was identified as Green Pond Gully. Bayou Din is also located along the southern limit of the AoR.

A total of two oil and gas wells were identified within the AoR, and both were reported as plugged and abandoned in the available records from the Railroad Commission of Texas. The stratigraphic well drilled by ExxonMobil is also located within the AoR. Beyond the AoR, the City of Beaumont, Texas, is located more than five miles northeast of the AoR boundary and the Town of China, Texas, is located approximately one mile northwest of the AoR boundary.

8.4 Identification of Risk Scenarios of Interest

Through the risk assessment process, the following list of scenarios were considered of sufficient probability and consequence to warrant development of response action plans. Other scenarios were considered but were found to have relatively low probability and consequence factors and thus do not warrant further consideration at this time. As shown below, a total of nine risk scenarios were considered for the ERRP.

Table 8-1: Hypothetical Risk Scenarios for ERRP

CO2 and Brine Containment or Control Feature of Interest	Hypothetical Release Mechanism associated with Risk Scenario
1. Mechanical Integrity of Injection Well Casing or Cement Seal	1a. CO2 release arising from injection well cement degradation or annular space defects in cement completion.
	1b. CO2 or brine leaks to USDW at injection well because of cement degradation or annular space defects in cement completion.
	2a. CO2/brine crossflow to USDW at legacy well in AoR with lack of casing or cement integrity issues.

CO2 and Brine Containment or Control Feature of Interest	Hypothetical Release Mechanism associated with Risk Scenario
2. Artificial Penetrations of UCCZ	2b. CO2 release detected at a legacy well because of loss of casing or cement mechanical integrity, implying a release has occurred that may endanger USDWs.
3. Mechanical Integrity of Operating Equipment	Pressure gauge malfunction or shut-off valve malfunction results in an uncontrolled pressure situation and CO2/brine crossflow to USDW by fault or fracture activation or well casing and/or cement failure in the vicinity of the production casing perforations.
4. Natural Features Affecting Sealing Properties of UCCZ	4a. CO2/brine leaks through an existing fault or fracture through UCCZ within the AoR impacting a USDW.
	4b. Lateral egression of CO2/brine below primary seal, beyond AoR, and release to USDW via unknown fracture or fault.
	4c. Induced or natural seismic event creates or enhances the transmissivity of faults or fractures in the UCCZ, resulting in an increased potential for CO2 or brine migration along the pathways toward USDWs.
	4d. Induced or natural seismic event occurs creates or enhances mechanical integrity deficiency in the cement and plug of an artificial penetration, resulting in an increased potential for CO2 or brine migration along the pathways toward USDWs.

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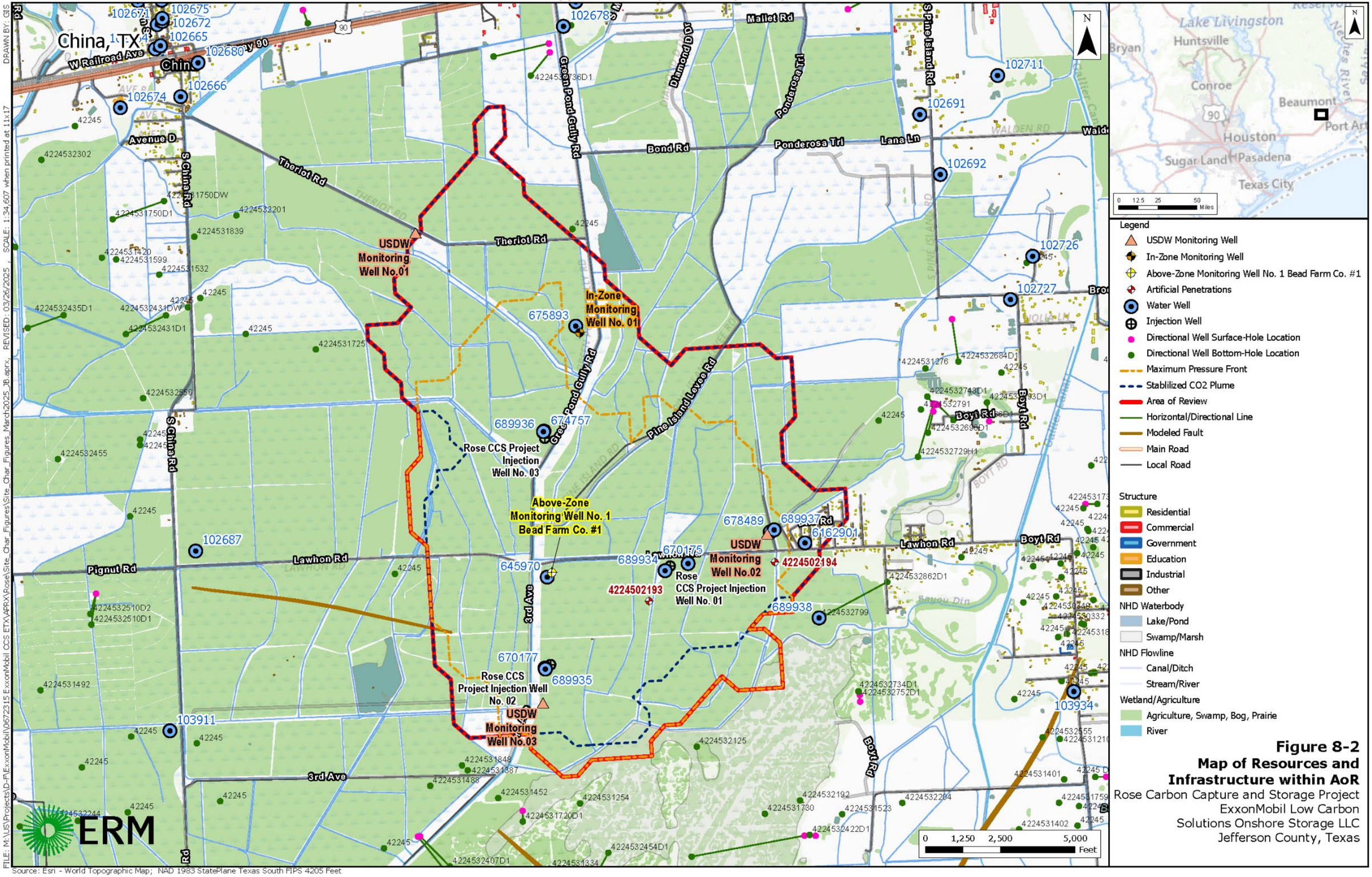


Figure 8-2
Map of Resources and Infrastructure within AoR
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

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8.5 Use of Severity to Define Scope of Response Action

Response actions were developed for each of the nine hypothetical risk scenarios identified for the ERRP. As listed in Table 8-2, the severity of the risk scenario was fit to a three-tiered categorization of emergency conditions. In addition, the response actions envision a stage-gate process where the information regarding the degree of severity for the emergency condition is evaluated to align the appropriate level of response to bring about mitigation of the emergency event.

Table 8-2: Degrees of Risk for Emergency Events

Emergency Condition	Definition
Major emergency	Events pose immediate substantial risk to USDWs and indirectly from USDW endangerment to resources or infrastructure. Emergency actions involving local authorities (evacuation or isolation of areas) must be initiated.
Serious emergency	Event poses potential serious (or significant) near term risk to USDW and indirectly from USDW endangerment to resource or infrastructure if conditions worsen or no response actions taken.
Minor emergency	Event poses no immediate risk to USDW, resources, or infrastructure.

In accordance with 40 CFR 146.94(b), for the events below, if the injected CO2 stream and associated brine pressure front may cause an endangerment to a USDW, each set of response actions start with immediately ceasing injection and notifying the UIC Program Director within 24 hours of the confirmation of a release event and the intention to implement the appropriate response action in the ERRP.

8.6 Response Plans for Risk Scenarios

The following response action details are provided to have a pre-approved set of actions in place should measurements collected pursuant to the Section 5 – Testing and Monitoring Plan indicate a malfunction or deviation from permitted limits.

8.6.1 Integrity of Injection Well Casing or Cement Seal

Two hypothetical release mechanisms were identified for injection wells that could possibly result in a release of CO2 and/or brine to USDWs. CO2 could be detected at an injection well, implying that internal or external mechanical integrity of an injection well may have been compromised and released CO2 to USDWs. CO2 or brine could also be released to USDW at the injection well because of subsurface cement degradation or annular space defects in cement completion.

Hypothetical Release Mechanism: mechanical integrity failure at injection well resulting in release of CO2 and/or CO2 and/or brine to USDWs.
Severity:
• Minor: A malfunction in the monitoring equipment created a false positive indication of a release when in fact none occurred. Alternatively, detection monitoring equipment at the wellhead facility detects the release and the well was shut-in, representing a minor CO2 release.
• Serious: A failed MIT identified a release mechanism, but detection of brine or CO2 was not apparent in the detection monitoring system.
• Major: A detection of CO2 and/or brine to USDW within the AoR prior to confirming the source of the injection well release point.

Timing of event: Injection and/or post-injection phase.
Avoidance measures:
• Proper wellbore design, including the use of corrosion resistant cement and CO2 compatible metallurgy of the casing and tubing, will be used for construction of the injection well.
• Routine inspection of the well casing and cement integrity to identify potential corrosion or deficiencies.
Detection methods:
• Deficiency identified during continuous pressure and temperature monitoring, pressure falloff tests, and annulus pressure tests.
• Wellhead pressure exceeds the maximum pressure specified in the permit.
• Annulus pressure indicates a loss of external or internal integrity/containment.
• CO2 plume and pressure tracking above UCCZ indicates a change in conditions.
• Fluid samples from above the UCCZ and USDW indicate a statistically significant change in conditions.
• MIT identifies a potential issue in the integrity of the well.
• Well casing and cement bond logs conducted during shut-ins to assess loss decay or corrosion more than acceptable limits.
Response actions:
• Notify ExxonMobil Site Manager and site personnel.
○ The Site Manager will respond to the event for an initial assessment to determine severity of event.
• Minor Event:
○ Close the wellhead valve to shut-in well. Perform investigation. If the investigation shows a false positive, reopen the valve and continue operations.
○ If there is a loss of containment, vent CO2 from surface facilities.
○ Monitor well and annulus pressures.
○ Collect fluid samples from detection monitoring well network to compare water quality and geochemical parameter concentrations with baseline conditions.
○ If there is a loss of containment, implement mitigation strategy for remedial actions with consultation of UIC Program Director.
• Serious or Major Event:
○ Close wellhead valve to shut-in well.
○ If appropriate, vent CO2 from surface facilities.
○ Engage with ExxonMobil emergency response team to ensure that any necessary and appropriate notifications to local authorities are made and if additional emergency actions are necessary.
○ Monitor well head for CO2 and casing and annulus pressures.
○ Identify and implement remedial actions to repair damage to well. Repairs will be conducted with UIC Program Director approval and guidance.
○ Collect fluid samples from detection monitoring wells and compare results with baseline and acceptable health-based concentration thresholds. If exceedances, consultation of the UIC Program Direct on expansion of detection monitoring program and need for interim response actions.
○ Implement additional groundwater monitoring as required by UIC Program Director to define extent and magnitude of release.
○ If health-based concentrations are exceeded, notify UIC Program Director of exceedances for determination of the need for USDW remediation.

○ If health-based concentrations are exceeded in the vicinity of water wells, coordinate with the UIC Program Director to provide an alternate potable water supply.
○ Continue USDW remediation program and compliance monitoring based on UIC Program Director requirements until a determination of no further action is obtained from UIC Program Director.
○ Once a no further action determination has been obtained from UIC Program Director, conduct MIT for confirmatory indications that the well integrity has been restored.
○ With the UIC Program Director's approval, develop a plan for re-initiating the injection well.
○ Demonstrate mechanical integrity.
○ Seek permit authorization from UIC Program Director for resuming injection.
Personnel: Emergency response personnel, geotechnical professionals, and environmental or water-treatment professionals.
Equipment: Drill rig, logging equipment for cement or casing materials, MIT equipment, environmental media sampling equipment, well plugging equipment.

8.6.2 Integrity of Injection Well Casing or Cement Seal for Legacy Wells

Consistent with the potential for CO2 or brine to migrate to USDW at an injection well, artificial penetrations of the UCCZ from legacy oil and gas activities may provide a similar risk scenario. Legacy wells were identified within the AoR that penetrate the UCCZ. The plugging of legacy wells will be completed as a corrective action prior to operation. The objective of this risk scenario is to provide the response actions in the event that unknown legacy wells are found and suspected of CO2 and/or brine leakage to USDWs as a result of potential casing or cement integrity issues in the AoR.

Hypothetical Release Mechanism: CO2 and/or brine migrate to USDW at an artificial penetration as detected within the AoR.
Severity:
• Minor: direct and indirect CO2 plume and pressure front tracking indicate that the legacy well is in the path of migration with the potential to create elevated pressures and a potential for corrosive environment to be created at the well location.
• Serious: direct and indirect CO2 plume and pressure front tracking indicate that the legacy well has been impacted with minor increases of CO2 and/or brine pressures and corrosive fluids.
• Major: direct and indirect CO2 plume and pressure front tracking indicate that the legacy well has been impacted by pressures that could create a crossflow potential between the injection zone and USDW if a conduit were present.
Timing of event: Injection and/or post-injection phase.
Avoidance measures:
• Compliance with CO2 plume and brine tracking systems.
• Plume model updates to predict pressure front arrival times at legacy well locations and adjust timing of phased-corrective action.
Detection methods:
• CO2 plume and pressure tracking indicates impact is likely.

• Fluid samples from above the UCCZ and USDW indicate a statistically significant change in conditions.
• Well re-entry to collect casing and cement bond logs to assess integrity and well completion materials.
Response actions:
For minor severity: enhancing CO2 plume and pressure front tracking data collection program and update plume model calibration with additional data points, as appropriate. Confirm migration pathways and adjust operating conditions to reduce the potential to impact legacy well and increase data monitoring frequency to confirm potential impacts.
For major and serious events:
• Notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
• Determine the severity of the event, based on the information available, within 24 hours of notification.
• Initiate shutdown plan in accordance with well permit.
• Notify emergency contacts.
• Conduct testing and monitoring at legacy wellhead to assess mechanical integrity and potential points of mechanical failure.
• Assess location and degree of CO2 movement, as described in Section 5 – Testing and Monitoring Plan.
• If the presence of CO2 or brine crossflow is likely, develop (in consultation with the UIC Program Director) a case-specific work plan to install additional groundwater monitoring points near the affected legacy well to assess potential for migration above the UCCZ and into USDW, delineate impact if found.
• Compare fluid sample concentrations with risk-based human health thresholds to identify whether an exceedance of acceptable limits has occurred.
• If so, prepare a remedial plan for UIC Program Director review and approval.
• Recomplete legacy well plugging to restore the integrity of cement plugs at UCCZ and base of USDW.
Personnel: Emergency response personnel, geotechnical professionals, and environmental or water-treatment professionals.
Equipment: Drill rig, logging equipment for cement or casing materials, MIT equipment, environmental media sampling equipment, well plugging equipment.

8.6.3 Injection Well Monitoring Equipment Failure

Loss of mechanical integrity of well pressure equipment may occur during operation of the injection wells. A pressure gauge malfunction or other similar equipment could create a shut-off valve malfunction and result in an uncontrolled pressure situation and CO2/brine crossflow to USDW by fault or fracture activation or well casing and/or cement failure in the vicinity of the production casing perforations.

Hypothetical Release Mechanism: Loss of mechanical integrity of well pressure equipment could create a shut-off valve malfunction and result in an uncontrolled pressure situation and CO2/brine crossflow to USDW by fault or fracture activation or by well casing and/or cement failure in the vicinity of the production casing perforations.
Severity:

• Minor: Failure of monitoring equipment to document compliance with permit operating conditions, but subsequent evaluation of available information demonstrates that well integrity has not been impacted.
• Serious/Major: Failure of monitoring equipment to document permit operating conditions and subsequent evaluation of the data documents non-compliance with permitted operating conditions and potential for well integrity impacts.
Timing of event: Injection phase and/or post-injection phase.
Avoidance measures:
• Routine equipment inspection and maintenance to identify potential integrity issues that may be a result of equipment failure.
• Routine inspections and calibration of monitoring equipment in accordance with manufacturers recommended procedures.
• Consistent fluid sampling throughout the detection monitoring well network to detect a release above the UCCZ.
• Redundant pressure and temperature measurements in the injection zones to confirm compliance with permitted operating conditions.
Detection methods:
• Anomalies in pressure and rate monitoring, pressure falloff tests, and annulus pressure tests.
Response actions:
• Notify ExxonMobil Site Manager and site personnel.
○ The Site Manager will respond to the event for an initial assessment to determine severity of event.
• Notify the UIC Director within 24 hours per 40 CFR 146.91(c).
• Determine the cause and severity of failure to determine if the CO2 stream or formation fluids may have been released into any unauthorized zone.
• For a Minor emergency (sensor or monitoring failure):
○ Conduct assessment to determine whether there has been a loss of mechanical integrity.
○ If there has been a loss of mechanical integrity, initiate shutdown plan and refer to Major or Serious emergency guidelines.
○ Evaluate the cause of failure, and mitigate if necessary (i.e., repair equipment).
○ Contact security to restrict access to the storage site.
○ Vent CO2 from surface facilities.
○ Continuously monitor well pressure, temperature, and annulus pressure to assess integrity loss and determine the root cause of failure.
○ Confirm well integrity prior to restarting injection and upon approval of the UIC Program Director.
• For a Major or Serious emergency (failure of sensors that will require shutdown of well to repair, requires extended repair time [i.e., >48 hours] and/or well intervention to remediate):
• Contact security to restrict access to the storage site.
• Communicate with ExxonMobil personnel and local authorities to isolate the area and initiate evacuation plans, if necessary.
• Initiate shutdown plan and shut-in injection well and vent CO2 from surface facilities.
• Manually collect surface tubing pressure and annulus pressure as needed to monitor the well until monitoring equipment is repaired.
• Collect fluid samples from detection monitoring wells and compare results with baseline and acceptable health-based concentration thresholds. If exceedances, consultation of the UIC

Program Direct on expansion of detection monitoring program and need for interim response actions.
• Implement additional groundwater monitoring as required by UIC Program Director to define extent and magnitude of release.
• If health-based concentrations are exceeded, notify UIC Program Director of exceedances for determination of the need for USDW remediation.
• If health-based concentrations are exceeded in the vicinity of water wells, coordinate with the UIC Program Director to provide an alternate potable water supply.
• Continue USDW remediation program and compliance monitoring based on UIC Program Director requirements until a determination of no further action is obtained from UIC Program Director.
• Once a no further action determination has been obtained from UIC Program Director, conduct MIT for confirmatory indications that the well integrity has been restored.
• With the UIC Program Director's approval, develop a plan for re-initiating the injection well.
• Demonstrate mechanical integrity.
• Seek permit authorization from UIC Program Director to resume injection under permit authorization.
Personnel: Emergency response personnel, geotechnical professionals, and environmental or water-treatment professionals.
Equipment: Drill rig, logging equipment, cement or casing materials, and air and water testing equipment.

8.6.4 Integrity of the UCCZ

Several potential risk scenarios were considered that involve a hypothetical release through naturally occurring faults and fractures or penetration of the UCCZ, creating a migration pathway toward USDW. For example, CO2 could hypothetically leak through natural faults or fractures in the UCCZ within or beyond the AoR and impact USDWs. CO2 or brine could hypothetically migrate horizontally to artificial penetrations within or beyond the AoR that are not sealed at the UCCZ and result in a release to USDWs. Response actions were developed to address such scenarios in the event that they occur.

The primary limiting factor for the magnitude of the release for these scenarios was based on the site characteristics described in Section 2 – Site Characterization. CO2 and brine leaks through shales due to mechanical fracturing were not considered a material concern for the Project because of the physical nature of the confining shale materials. Above the UCCZ is approximately 3,000 feet of saturated shale, mudstone, and sand. Such a release would likely be detected by the detection monitoring program for groundwater prior to release to the surface. Therefore, ambient air monitoring in the AoR was contingent on the confirmed release of CO2 to USDW at sufficient concentrations to migrate to the surface at levels above health-based thresholds.

The following response actions were developed to mitigate the potential for releases through the UCCZ, which were assumed to occur during injection operations and/or post-injection site care.

Hypothetical Release Mechanism: release through naturally occurring faults and fractures or penetration of the UCCZ, creating a migration pathway toward USDWs.
Severity:

• Minor: direct and indirect CO2 plume and pressure front tracking indicate that a fault or fracture is in the path of migration with the potential to create elevated pressures sufficient to cause crossflow above the UCCZ.
• Serious/Major: direct and indirect CO2 plume and pressure front tracking indicate that a fault or fracture has been impacted by pressures that will likely create a crossflow potential between the injection zone and USDW. For faults and fractures, the threshold pressure is based on fault-slip potential (Section 2.11).
Timing of event: Injection and/or post-injection phase.
Avoidance measures:
• Compliance with CO2 plume and brine tracking systems.
• Plume model updates to predict pressure front arrival times at fault and fracture locations and adjust timing of phased detection monitoring programs elements.
Detection methods:
• CO2 plume and pressure tracking indicates impact is likely.
• Fluid samples from above the UCCZ and USDW indicate a statistically significant change in conditions.
• Third-party direct or indirect data confirm impact to fault, fracture, or artificial penetration outside of AoR.
Response actions:
• If the detection monitoring program outline in the Section 5 – Testing and Monitoring Plan or similar third-party monitoring program detects a potential release of CO2 or brine through the UCCZ to the first water-bearing zone above the UCCZ or USDW, notify the UIC Program Director within 24 hours of the emergency event, per 40 CFR 146.91(c).
• Determine the severity of the event, based on the information available, within 24 hours of notification.
• For all emergencies (Major, Serious, or Minor):
○ Initiate shutdown plan.
○ Notify emergency contacts.
○ Implement an ambient air monitoring program in the vicinity of the CO2 plume in groundwater and the release mechanism.
○ Conduct a Vertical Seismic Profile to assess location and degree of CO2 movement, as described in Section 5 – Testing and Monitoring Plan.
○ If the presence of CO2 above the UCCZ is likely, develop (in consultation with the UIC Program Director) a case-specific work plan to install additional groundwater monitoring points to assess the extent of CO2 and brine migration above the UCCZ and into USDW.
○ Compare fluid sample concentrations with risk-based human health thresholds to identify whether or not an exceedance of acceptable limits has occurred in groundwater and evaluate the potential for cross-media transport to other environmental media.
○ If unacceptable concentrations are apparent, prepare remedial plan for UIC Program Director review and approval.
○ Use the water well survey provided in Section 5 – Testing and Monitoring Plan to determine if potable water wells are located in the vicinity of the affected groundwater that could potentially become impacted from the release.
○ If so, coordinate with the UIC Program Director to provide potable water to water well owners.
○ Continue remedial efforts to achieve a no further action determination from the UIC Program Director.

○ Seek permit authorization from UIC Program Director to resume injection under permit authorization.
Personnel: Emergency response personnel, geotechnical professionals, and environmental or water-treatment professionals.
Equipment: Drill rig, logging equipment, cement or casing materials, and air and water testing equipment.

8.6.5 Induced or Natural Seismic Event

Natural or induced seismic events of sufficient magnitude to create damage were found to be improbable for the site location and under permitted operating conditions that are below the critical fracture pressure. In the chance that such seismic conditions occurred, the consequences could be of significance regarding the integrity of the artificial penetrations of the UCCZ and the natural faults and fractures. Therefore, the following response actions were developed to gather information regarding the potential for CO2 and brine confinement issues to arise under such events.

ExxonMobil will rely upon U.S. Geologic Survey seismic monitoring data for the site and surrounding area to provide information on a seismic event, should one occur. If a review of the data indicates that the event was more likely than not associated with the injection zone in or near the AoR, ExxonMobil will notify the UIC Program Director of the intent to install a site-specific network of seismic stations to provide additional information with the regional seismic data. The details of the site-specific seismic monitoring system will be provided to the UIC Program Director as a modification of Section 5 – Testing and Monitoring Plan. Table 8-3 provides the response actions depending on severity of the seismic event.

Table 8-3: Response Actions for Seismic Events

Threshold Condition[1]	Response Action for Epicenter Within a 100-Square Mile Area (5.6-Mile Radius) of an Injection Well[2]
Seismic event above M2.0 and below M3.0	• Monitor well pressure, temperature, and annulus pressure to assess if well operation within permitted status and assess the potential for mechanical integrity issues to have occurred from the seismic event. Otherwise, continue normal operation within permitted levels and review seismic data. • Reporting findings to the UIC Program Director as appropriate
Seismic event >M3.0	• Communicate with facility personnel and local authorities about the operating condition of the injection wells and initiate correspondence with other nearby operators. • Monitor well pressure, temperature, and annulus pressure to verify well operation within permitted status and assess the potential for mechanical integrity issues to have occurred from the seismic event. • If evidence of mechanical integrity failure, cease injection, notify the UIC Program Director within 24 hours, and, if the loss of mechanical integrity may endanger the USDW, implement the emergency and remedial response plan approved by the UIC Program Director.

Threshold Condition[1]	Response Action for Epicenter Within a 100-Square Mile Area (5.6-Mile Radius) of an Injection Well[2]
	• Collect fluid samples from above-zone monitoring well and USDW monitoring wells. • Review seismic and operational data to identify potential source areas for a release above the UCCZ. • Within 30 days of the triggering seismic event, determine causality and if deemed causally related propose appropriate corrective measures to our operations. • Report findings to the UIC Program Director and implement corrective measures if warranted. • Operations will resume upon UIC Program Director concurrence that necessary remedial or corrective measures have been taken such that the risk to USDW is in compliance with EPA standards for protection of human health and the environment.
[1] Specified magnitudes determined by local or U.S. Geological Survey seismic monitoring stations or reported by the U.S. Geological Survey National Earthquake Information Center using the national seismic network. [2] Based on Texas Railroad Commission Seismicity Review (RRC, 2024)	

8.7 Response Personnel and Equipment

Site personnel, Project personnel, and local authorities will be relied upon to implement this ERRP and will be dispatched in the case of an emergency. In the event of an emergency, appropriate city, county, and state emergency responders and agencies may be notified based on severity of the risk. Contact information for ExxonMobil Emergency Authorities and state and local emergency services are outlined in Table 8-4 and Table 8-5, respectively.

A site-specific emergency contact list will be developed and maintained during the life of the Project. ExxonMobil will provide the current site-specific emergency contact list to the UIC Program Director.

Table 8-4: Contact Information of ExxonMobil Emergency Authorities

Name	Title	Telephone Number
Claimed as PBI	Vice President	Claimed as PBI
	Emergency Preparedness & Response Advisor	
	Public & Government Affairs Advisor	

Table 8-5: Emergency Services

Agency	Telephone Number
Beaumont Fire and Rescue Station 1	911 or (409) 880-3901
Jefferson County Sheriff	911 or (409) 835-8411
Jefferson County Public Health Unit #1	(409) 835-8530
Jefferson County Office of Emergency Management	(409) 835-8757
Texas Division of Emergency Management	(512) 424-2208
Texas Department of Public Safety	(512) 424-2000
State of Texas Spill-Reporting Hotline	1-800-832-8224
Texas Parks and Wildlife Department	(512) 389-4800

Agency	Telephone Number
EPA Region 6	800-887-6063 or 214-665-2760
EPA Class VI Contact – Brandon Maples	214-665-7252
Texas Department of Natural Resources	(512) 389-4800
Jefferson County Local Emergency Planning Committee	(409) 835-8757
National Response Center	1-800-424-8802
State of Texas Spill-Reporting Hotline	1-800-832-8224
EPA National Response Center (24 hours)	(800) 424-8802

Necessary equipment for emergency and remedial response may vary depending on the event. Generally, no specialized equipment will be required for response actions (such as cessation of injection, well shut-in, and evacuation). If specialized equipment (such as a drilling rig or logging equipment) is required, ExxonMobil will be responsible for its procurement.

8.8 Communications Plan and Emergency Notification Procedures

As appropriate, ExxonMobil will communicate to the relevant public authorities about an event that may require emergency response so that the public understands the emergency event and if there are any environmental, health, or safety concerns. Based on the emergency event, ExxonMobil will determine the appropriate information, timing, and communication method for the event. This information may include potential impact of the event on drinking water or the severity of the event, actions taken or planned to address the event, and other information needed to protect the public during the event.

If required, ExxonMobil will also communicate with other entities who may need to be informed about or act in response to the event. These may include local water purveyors or operators, CO2 suppliers, pipeline operators, oil and gas operators, landowners, and other departments or authorities as guided by the UIC Program Director.

8.9 Flood Hazard Risk

Injection Wells No. 01, No. 02, and No. 03 and the surrounding area are designated as Federal Emergency Management Agency flood hazard zone X (unshaded). Flood hazard zone “X” (unshaded) corresponds to areas determined to be outside of the 500-year floodplain. This zone is an area of minimal flood hazard, which is higher than the elevation of the 0.2-percent-annual-chance flood. The well locations and Federal Emergency Management Agency flood zones are shown in Appendix G.

8.10 Plan Review

The UIC Program Director will evaluate this proposed ERRP to verify that ERRP meets the requirements of 40 CFR 146.94(a) and that the plan accounts for all site-specific conditions. The approved ERRP is enforceable, whether or not it is a condition of the permit, because the plan itself and UIC Program Director’s approval are required by the Class VI Rule [40 CFR 146.93(a)].

This ERRP shall be reviewed:

- At least once every five years following its approval by the permitting agency [40 CFR 146.94(d)].
- Within one year of any AoR reevaluation [40 CFR 146.94(d)(1)].

- Following any significant changes to the facility, such as addition of injection or monitoring wells, on a schedule determined by the Director [40 CFR 146.94(d)(2)]; or
- When required by the Director [40 CFR 146.94(d)(3)].

If the review indicates that no amendments to the ERRP are necessary, ExxonMobil will provide the permitting agency with the documentation supporting the “no amendment necessary” determination. If the review indicates that amendments to the ERRP are necessary, amendments shall be made and submitted to the permitting agency within 30 days following an event that initiates the ERRP review procedure.

The amended plan must be approved by the UIC Program Director and would then be incorporated into the Class VI Permit. If significant changes to the plan are needed, the UIC Program Director may need to modify the permit. A permit modification under 40 CFR 144.39 would require notification of the public and an opportunity for comment. Minor changes to the plan, as defined under 40 CFR 144.41, do not require a permit modification or a public process under 40 CFR Part 124.

8.11 Staff Training and Exercise Procedures

Personnel will be trained in their duties and responsibilities related to these facilities. Emergency Response Drills will be conducted annually via simulated onsite or table-top scenarios. All plant personnel, visitors, and contractors must complete a plant overview orientation before entering the facilities. ExxonMobil will coordinate with local mutual aid emergency responders over the potential hazards and response scenarios of the site.

Trainings that have and will be provided include topics such as characteristics of carbon dioxide, oxygen displacement, leak detection and identification, emergency response, and isolation and incident management. Specific trainings to be provided could include:

- Incident Command System for Initial Response ICS-100/200
- 24-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training
- CO2 training course

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ExxonMobil

Underground Injection Control – Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

SECTION 9 – FINANCIAL ASSURANCE

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage LLC

May 2025

SECTION 9 – FINANCIAL ASSURANCE

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Appendix J – Financial Assurance

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Appendix J-2: Executed Corporate Guarantee

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9.0 Financial Assurance

ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) is undertaking the Rose Carbon Capture and Storage (CCS) Project (Project) in Jefferson County, Texas to sequester a maximum of 5 million metric tonnes per annum of carbon dioxide (CO2) using three injection wells over an injection period of up to 13 years. The predicted total CO2 storage is 53 million metric tonnes. Under the Code of Federal Regulations, Title 40, Section 146.85 [40 CFR 146.85], owners or operators of geologic sequestration (GS) injection wells are required to demonstrate financial responsibility for GS activities.[1] Consistent with these regulatory requirements, ExxonMobil has prepared this document to demonstrate financial responsibility for the injection wells that comprise the Rose CCS Project (Rose Site[2]).

The sections that follow summarize the Project's GS activities, as well as the qualifying financial instrument that ExxonMobil proposes to use, to demonstrate financial responsibility for the following Project phases: (1) Corrective Action; (2) Injection Well Plugging; (3) Post-Injection Site Care (PISC) and Site Closure; and (4) Emergency and Remedial Response (ERR).

9.1 Facility Information

Facility Name:	ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) – Rose CCS Project
Facility Contact:	Claimed as PBI ExxonMobil Low Carbon Solutions Onshore Storage LLC
Project Site Name:	Rose Carbon Capture and Storage Project
Project Location:	Jefferson County, Texas
Well Name and Number	Labelle Properties Ltd #1 (**Rose CCS Project Injection Well No. 01)**
County	Jefferson
Location (RR D, S, A)	Railroad District 3, Section 42, Abstract 874
Latitude / Longitude (NAD83)	29.999678 / -94.285108
American Petroleum Institute	4224532913

[1] The use of the term "geologic sequestration activities" is unique to this section of the Application. It is used to provide additional clarity on which activities of the Project's lifecycle necessitate financial assurance from those that do not, consistent with EPA guidance for financial assurance.

[2] Reference to the Project as the "Rose Site" is used in this section of the Application to distinguish between this Project and other ExxonMobil project applications undergoing simultaneous financial assurance review.

Well Name and Number	Bead Farm Co. #2 (**Rose CCS Project Injection Well No. 02)**
County	Jefferson
Location (RR D, S, A)	Railroad District 3, Section 41, Abstract 266
Latitude / Longitude (NAD83)	29.991017 / -94.298036
American Petroleum Institute	4224532911

Well Name and Number	Bead Farm #3 (**Rose CCS Project Injection Well No. 03)**
County	Jefferson
Location (RR D, S, A)	Railroad District 3, Section 8, Abstract 658
Latitude / Longitude (NAD83)	30.011778 / -94.297858
American Petroleum Institute	4224532912

9.2 Financial Assurance Demonstration

Per 40 CFR 146.85(a)(1)(v), ExxonMobil requests approval from the Underground Injection Control (UIC) Program Director, or their designee, to use a corporate guarantee from Exxon Equity Holding Company (EEHC) for purposes of demonstrating financial responsibility for Corrective Action, Injection Well Plugging, PISC and Site Closure, as well as ERR. EEHC is an indirectly wholly owned subsidiary of Exxon Mobil Corporation (EMC). EEHC provides financial support to or on behalf of EMC's affiliates. EEHC maintains significant intercompany relationships with EMC and its affiliates as shown in Figure 9-1, and as of December 31, 2023, the company had interest-bearing deposits with EMC and its affiliates totaling Claimed as PBI The deposit balances are current and can be called upon demand. See Appendix J-1 for a copy of the independently audited financial statements for EEHC.

Figure 9-1: Corporate Structure



In support of the financial assurance demonstration, EEHC has provided a corporate guarantee to ExxonMobil, which is consistent in form to the corporate guarantee language included in Appendix B of the U.S. Environmental Protection Agency's (EPA) July 2011 guidance document (EPA, 2011). See Appendix J-2 for a copy of the executed corporate guarantee. As shown in Table 9-1, EEHC satisfies both Part 1 and Part 2 of the corporate financial test criteria in 40 CFR 146.85(a)(6)(v).

Table 9-1: Financial Coverage and Threshold Criteria for EEHC, as Guarantor to ExxonMobil for the Rose Site

Financial Coverage / Threshold Requirement per 40 CFR 146.85(a)(6)(v)[3]	EEHC Financial Measure
Part 1	
1. Tangible net worth of at least $100 million?[4]	Yes
2. Net working capital at least six times the sum of the current corrective action, well plugging, PISC and site closure, and ERR costs?	Yes
3. Tangible net worth of at least six times the sum of the current corrective action, well plugging, PISC and site closure, and ERR costs?	Yes

[3] As stated in Note 3 of EEHC's independently audited financial statements, *Deposits receivable from Exxon Mobil Corporation and affiliates* are current and can be called upon demand. All other assets were considered "non-current" for the purposes of this analysis. In addition, all liabilities were considered "current" since the audited financial statements do not differentiate current from non-current liabilities.

[4] ExxonMobil recognizes that 40 CFR 146.85(a)(6)(v) requires that its guarantor meet a Tangible Net Worth of an amount approved by the UIC Program Director. For purposes of this financial assurance demonstration, EEHC affirms that it maintains a Tangible Net Worth of at least $100 million, per the recommended threshold included in EPA's July 2011 Class VI financial responsibility guidance (p. 15).

Financial Coverage / Threshold Requirement per 40 CFR 146.85(a)(6)(v)[3]	EEHC Financial Measure
4. Assets in the United States amounting to at least 90% of total assets or Assets in the United States amounting to at least six times the sum of the current corrective action, well plugging, PISC and site closure, and ERR cost estimate?	Yes
Part 2	
5. Total liabilities to net worth ratio less than 2.0?	Yes
6. Current assets to current liabilities ratio greater than 1.5?	Yes
7. Sum of net income plus depreciation, depletion, and amortization to total liabilities ratio greater than 0.1?	Yes
8. Current assets minus current liabilities to total assets ratio greater than *minus* 0.1?	Yes
9. Net profit (revenues minus expenses) greater than $0?	Yes

Appendix J-3 is a completed letter from Claimed as PBI [redacted] of EEHC, serving as the chief financial officer of EEHC, that demonstrates the company's ability to meet the requisite financial coverage and threshold criteria, per 40 CFR 146.85(a)(6)(v). Appendix J-3 is consistent in form to the "Letter from Chief Financial Officer" included in Appendix B of the EPA's July 2011 guidance document.[5]

Consistent with the EPA's July 2011 guidance, ExxonMobil provides this demonstration of fiscal responsibility with the understanding that the financial instruments referenced herein will be updated and verified no less than annually. As each GS activity phase is initiated, ExxonMobil will confirm that the coverage limits provided by the respective financial responsibility instruments are sufficient to cover the corresponding costs prior to initiating the Project phase.

Furthermore, per Texas Administrative Code §5.205, ExxonMobil requests approval from the Texas UIC Program Director, or their designee, to use a bond for purposes of demonstrating financial responsibility for Corrective Action, Injection Well Plugging, PISC and Site Closure, as well as ERR. The required documentation to satisfy this requirement is in Appendix J-5.

9.3 Estimated Coverage Amounts

The total current cost estimate for the Project's GS activities necessitating financial assurance at the Rose Site is $23,631,000 in 2025 dollars. This total cost estimate assumes the hiring of independent, third-party contractors to perform the required activities for each Project phase. The cost estimate is separated into the following phases:

1. Phased-Corrective Action for artificial penetrations (legacy wells) in the Area of Review (AoR) remaining after initiating operations;
2. Well Plugging[6] to occur after 13 years of site injection;

[5] *op.cit.* See B-19 Appendix B: Recommended Financial Responsibility Instrument Language (Forms/Templates).

[6] Financial responsibility coverages for well plugging reflect the current estimated cost for plugging the three injection wells and four monitoring wells related to the Project.

3. PISC: beginning after 13 years of site injection and ending with Site Closure 50 years after injection ends; and
4. ERR: beginning after 13 years of site injection and ending with Site Closure .

Table 9-2 summarizes the total estimated cost of performing each GS activity, along with the timeline for which financial assurance coverage is expected to be needed. The values included in this demonstration of financial responsibility are based on cost estimates developed as part of the Application process and assume the hiring of third-party contractors to perform the services or to procure the goods associated with the performance of each GS activity. These values are subject to change during the life of the Project to account for inflation of costs and changes to the Project that may affect the cost of covered activities. Per 40 CFR 146.85(c), during the active life of the Project, ExxonMobil will adjust the cost estimate for inflation within 60 days prior to the anniversary date of the establishment of the financial assurance instrument. In addition, ExxonMobil will provide to the UIC Program Director written updates of adjustments to the cost estimate within 60 days of any amendments to the AoR and Corrective Action Plan [40 CFR 146.84], the injection well plugging plan [40 CFR 146.92], the PISC and Site Closure Plan [40 CFR 146.93], and the emergency and remedial response plan (ERRP) [40 CFR 146.94].

ExxonMobil will adjust the value of its financial assurance instruments in response to any changes in cost estimates and will resubmit its revised demonstration of financial responsibility to the UIC Program Director or their designee for review and approval. ExxonMobil will not adjust the established coverage values of any financial assurance instrument without prior approval from the UIC Program Director, or their designee.

Table 9-2: Summary of Financial Assurance Coverage Values by GS Activity

GS Activity	Estimated Financial Assurance Coverage Value
Corrective Action	$0
Well Plugging	$3,603,000
PISC and Site Closure	$11,420,000
ERR	$8,608,000
TOTAL	$23,631,000
Note: Section 3 – Area of Review and Corrective Action Plan, Section 5 – Testing and Monitoring Plan, Section 6 – Injection Well Plugging Plan, and Section 8 – Emergency and Remedial Response Plan provide detailed discussion of work to be undertaken, which forms the cost basis for the financial assurance coverage values summarized in this table	

9.4 Corrective Action

The Corrective Action Plan is discussed in detail in Section 3 – Area of Review and Corrective Action Plan. Per the requirements of 40 CFR 146.84, the plan specifically outlines both a plugging plan for the artificial penetrations found within CO2 plume and brine pressure front and the recompletion schedule whereby the wellbore modifications will have been completed.

For the planned activities at the Project, workovers on the legacy wells found to have sufficient deficiency as to represent a potential loss of CO2 or brine containment will be re-entered and plugged prior to receiving approval to inject from the UIC Program Director. No corrective actions are expected to be needed beyond the model-predicted five-year extent of the AoR. The estimated financial assurance coverage value for this GS activity is shown in Table 9-3.

Per 40 CFR 146.84(a)(5)(ii), this financial responsibility demonstration will be updated annually to account for any changes in expected financial coverage values and to confirm that the financial instrument(s) then in place remain adequate for use.

Table 9-3: Summary of Corrective Action Costs Underpinning Financial Assurance Coverages

GS Activity	Estimated Financial Assurance Coverage Value
Corrective action on legacy wells (None identified)	$0
TOTAL	$0

9.5 Well Plugging

9.5.1 Injection Well Plugging

Plugging and abandonment (P&A) of the injection wells at the Project will meet the requirements of 40 CFR 146.92. The P&A plan for the injection wells was designed to reduce the potential for movement of CO2 or brine from the injection interval through the upper composite confining zone (UCCZ) and toward underground sources of drinking water (USDWs).

A detailed P&A plan is discussed in Section 6 – Injection Well Plugging Plan. In alignment with the requirements for the P&A plan, the estimated financial assurance coverage value includes costs for logs/wireline to be run in the wellbore before cementing occurs, if necessary. CO2-compatible cement will be used to set the cement plug for the first 100 feet of the UCCZ, followed by additional plugs at the base of the lowermost USDW and at the well surface. The expenses relating to personnel and equipment have been accounted for in Table 9-3.

9.5.2 Monitoring Well Plugging

P&A of the one in-zone monitoring well, one above-zone monitoring well, and three USDW monitoring wells associated with the Project will also meet the requirements of 40 CFR 146.92. As detailed in Section 6 – Injection Well Plugging Plan, the P&A of the monitoring wells was designed to protect USDW from potential endangerment. The estimated financial assurance coverage value for this GS activity includes the costs for logs and wireline to be run in the in-zone monitoring well before cementing occurs to the extent necessary. The expenses relating to personnel and equipment have been accounted for in Table 9-4.

Table 9-4: Summary of Estimated Well Plugging Costs Underpinning Financial Assurance Coverages

GS Activity	Estimated Financial Assurance Coverage Value	Total
Claimed as PBI [redacted]	[redacted]	[redacted]
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	

GS Activity	Estimated Financial Assurance Coverage Value	Total
Claimed as PBI		
TOTAL*		$3,603,000
*Note: Rounded to nearest ten-thousands.		

9.6 Post-Injection Site Care and Site Closure Plan

The PISC and Site Closure Plan has been designed to meet the requirements of 40 CFR 146.93. The estimated financial assurance coverage value for this GS activity includes the cost categories summarized in Table 9-5, while the plan itself is discussed in Section 7 – Post-Injection Site Care and Site Closure Plan.

9.6.1 Post-Injection Monitoring

As discussed in Section 5 – Testing and Monitoring Plan, surface seismic and pressure and temperature monitoring will be conducted during operation and after the end of injection to assess the integrity of the well and to track the migration of the CO2 plume and brine pressure front.

9.6.2 Site Closure Plan

Site closure will occur when the UIC Program Director has released the owner from PISC duties and the demonstration of non-endangerment for USDWs has been approved. The estimated financial assurance coverage value for this GS activity is summarized in Table 9-5 and reflects the expected amount to decommission and close the site.

Table 9-5: Summary of Estimated PISC and Site Closure Costs Underpinning Financial Assurance Coverages

GS Activity	Estimated Financial Assurance Coverage Value	Total
Claimed as PBI		

GS Activity	Estimated Financial Assurance Coverage Value	Total
Claimed as PBI		
TOTAL		$11,420,000
Claimed as PBI		

9.7 Emergency and Remedial Response

The ERRP is discussed in Section 8 – Emergency and Remedial Response Plan and is designed to satisfy the requirements of 40 CFR 146.94, which necessitates an ERRP that describes actions ExxonMobil will take to address movement of injection or formation fluids that may cause an endangerment to a USDW during construction, operation, and PISC periods.

The financial assurance coverage value for ERR is estimated to be $8,608,000 in 2025 dollars and is summarized in Table 9-6. This estimate assumes coverage for the following event-based risk activities at the Project: mechanical integrity of injection well casing or cement seal, artificial penetrations of the UCCZ, mechanical integrity of operating equipment, and natural features affecting sealing properties of the UCCZ. Details regarding the approach used to develop the risk-based scenarios, the levels of severity considered, and the actions to be taken to avoid, monitor, respond, and notify the occurrence of risk events are summarized in detail in Section 8.

Table 9-6: Summary of Estimated ERR Costs Underpinning Financial Assurance Coverages

GS Activity	Estimated Financial Assurance Coverage Value
Claimed as PBI	
TOTAL	$8,608,000

Underground Injection Control – Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

SECTION 10 – ENVIRONMENTAL JUSTICE

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage LLC

May 2025

SECTION 10 – ENVIRONMENTAL JUSTICE[1]

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[1] Note: Applicant is including this analysis due to its commitment to, and the importance of, community engagement in the Class VI well permitting process, as well as existing federal guidance. Applicant reserves the right in the future to revise this analysis if interpretation or implementation of federal law or regulation should change.

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Appendix K – Environmental Justice

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Appendix K-3: Summary on Community Feedback

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10.0 Environmental Justice[2]

This Environmental Justice (EJ) Screening Report (the Report) for the proposed Rose Carbon Capture and Storage (CCS) Project (Project) is an initial desktop assessment of potential EJ-related concerns that could be raised by the local community in which the Project will be located and will continue to be refined throughout the life of the Project. The Report identifies community characteristics useful in guiding engagement through Project planning, permitting, construction, operation, and decommissioning.

ExxonMobil Low Carbon Solutions Onshore Storage LLC (ExxonMobil) anticipates that Project development activities will be supportive of the environmental and socioeconomic needs of the communities in which the Project will operate. In addition, ExxonMobil has developed a Stakeholder Engagement Plan to facilitate meaningful community engagement with local leaders, residents, economic developers, environmental organizations, and others. Consistent with ExxonMobil's socioeconomic management principles (ExxonMobil, 2024)[3], a stakeholder grievance/feedback process is described in Section 10.3.2 below, which has been developed that will allow stakeholders to have access to ExxonMobil throughout the Project lifecycle.

The Report includes the use of an initial "EJ Study Area" to assess the presence of communities that may be associated with potential EJ concerns. Although Environmental Protection Agency (EPA) guidance states that the Area of Review is normally used as the boundary to be investigated for EJ purposes. ExxonMobil is going beyond that requirement here in that the EJ Study Area comprises the area within a two-mile radius around the Project (Project Footprint), which includes wells to the west and pipelines to the east. The Project Footprint is the physical area that will be occupied by the Project operations facilities or disturbed by Project construction or operations activities.[4] A radius of two miles was selected for the EJ Study Area because the bulk of construction and operation activities for the Project are expected to be concentrated within this area. The EJ Study Area includes 15 Census Block Groups (CBGs),[5] which are located in Jefferson County (EPA, 2023a) (Figure 10-1). Although a limited portion of CBG CT 222.00 BG 3 falls within a 2-mile radius of the Project Footprint, this CBG was not included based on the relatively small amount of the CBG within the 2-mile radius. As the Project is defined in further detail and community engagement continues, it is possible that additional CBGs may warrant assessment.

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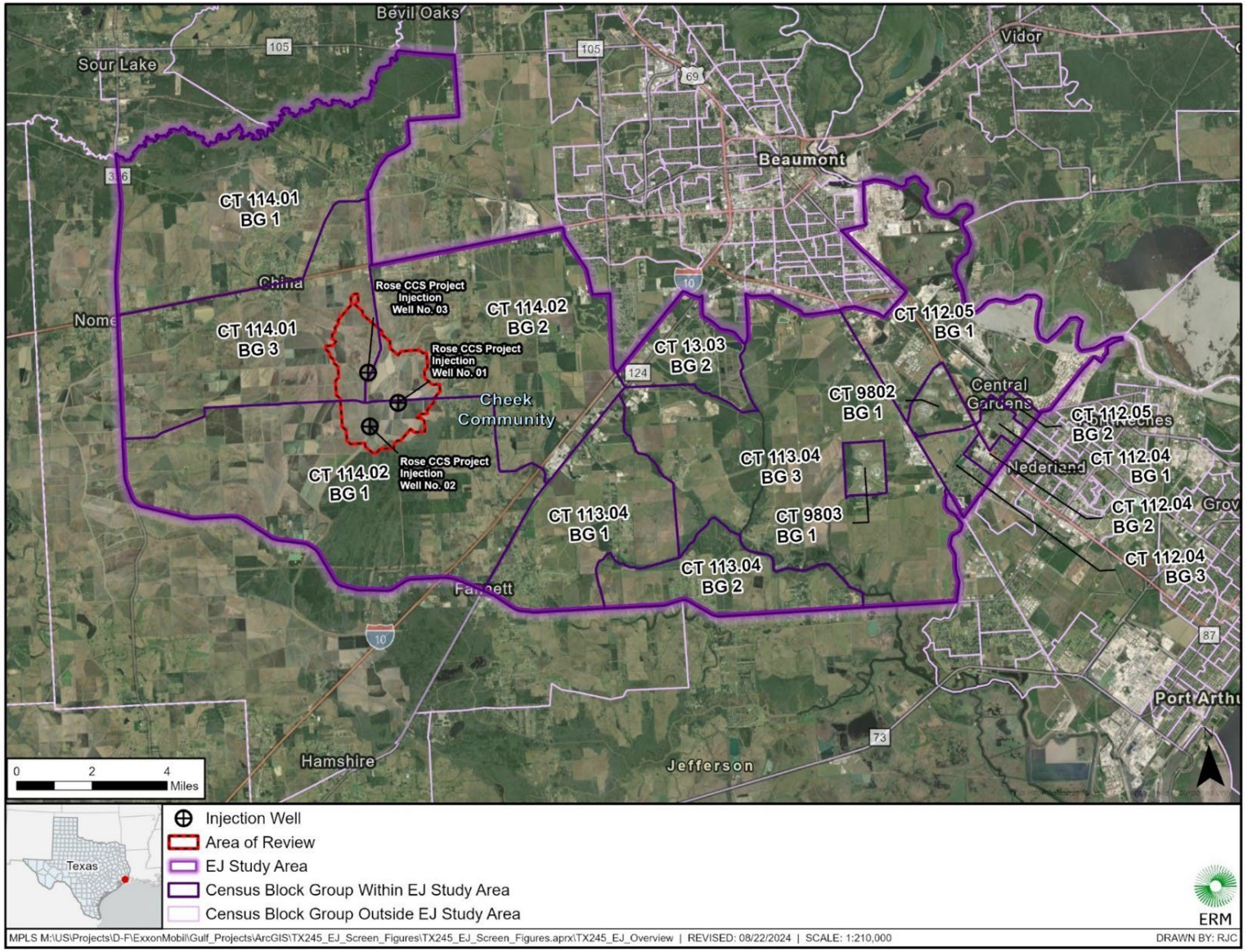
[2] ExxonMobil is including this analysis due to its commitment to, and the importance of, community engagement in the Class VI well permitting process, as well as existing federal guidance. Applicant reserves the right in the future to revise this analysis if interpretation or implementation of federal law or regulation should change.

[3] https://corporate.exxonmobil.com/sustainability-and-reports/sustainability/engaging-communities-and-our-supply-chain/managing-socioeconomic-impacts/community-engagement-and-grievance-management

[4] For the purpose of this Report, the Project Footprint does not include the existing roadways that will be used to transport Project construction materials or workers.

[5] A CBG is the smallest geographic unit used by the U.S. Census Bureau to collect data for decennial census data. A CBG consists of Block Groups (BGs) within Census Tracts (CTs). Throughout this EJ Report, individual CBGs are referred to by an identifier in the form "CT XXX BG X."

Figure 10-1: Census Block Groups within EJ Study Area



10.1 EPA EJ Screening

10.1.1 Summary

This Report employs the use of U.S. Census and other data for early identification of potential Project-related impacts and opportunities associated with potential EJ concerns. The 15 CBGs within the EJ Study Area demonstrate a range of socioeconomic characteristics. Based on an analysis of the data provided in this Report, the following are noted:

- The four western-most CBGs, those within two miles of the injection and underground source of drinking water monitoring wells, have similar socioeconomic characteristics and relatively low likelihood for potential EJ concerns. Possibility of potential EJ concerns may increase nearer to the source end of the Project, in CBGs at the center and eastern end of the EJ Study Area, and within proximity of the transmission infrastructure (pipeline).
- Six of the 15 CBGs in the EJ Study Area have minority populations exceeding 50 percent (%), including two CBGs intersecting the Project wells (CT 114.02 BG2 and BG3).
- Low-income population percentages greater than that of Jefferson County occur in two non-well CBGs: CT 113.04 BG 3 and CT 9802 BG 1. Both CBGs also have minority populations exceeding 50%.
- EJScreen EJ Indexes[6] are generally highest in the eastern and central portions of the EJ Study Area. Seven CBGs in the EJ Study Area have one or more EJ Indexes at or above the 80th percentile nationally. The environmental indicators with EJ Indexes at or above the 80th percentile nationally include: Air Toxics Cancer Risk (5 CBGs), Toxic Releases to Air (five CBGs), Air Toxics Respiratory Hazard Index (HI) (4 CBGs), Risk Management Plan Facility Proximity (four CBGs), particulate matter 2.5 (PM2.5; three CBGs), Ozone (two CBGs), Wastewater Discharge (two CBGs), Diesel PM (one CBG), Superfund Proximity (one CBG), and Hazardous Waste Proximity (one CBG).
- Six of the seven CBGs in the EJ Study Area with EJ Indexes at or above the 80th percentile nationally (CT 13.03 BG 2, CT 113.04 BG 3, CT 114.02 BG 1, CT 114.02 BG 2, CT 9802 BG 1, and CT 9803 BG 1) also have a minority population above 50% and/or a low-income population greater than that of Jefferson County.
- The majority of the CBGs in the western portion of the EJ Study Area have EJ Indexes below the 80th percentile nationally.
- Both CT 9802 BG 1 and CT 9803 BG 1 contain correctional facilities, driving differences in demographic and socioeconomic conditions as compared to other CBGs in the EJ Study Area.

[6] For each CBG, each environmental indicator has its own EJ Index, which combines the demographic index (which averages low-income and people of color populations) with the respective environmental indicator percentile value for the CBG. For example, the EJ index for traffic for a given CBG is calculated as (traffic indicator percentile for the CBG) x (average of low-income population percentage and the people of color population percentage for CBG).

10.1.2 Methodology

The U.S. Environmental Protection Agency (EPA) defines EJ as the:

> "[F]air treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. This goal will be achieved when everyone enjoys:
>
> - The same degree of protection from environmental and health hazards; and
> - Equal access to the decision-making process to have a healthy environment in which to live, learn, and work."

The EPA EJ guidance (EPA, 2016; EPA, 2022) does not prescribe a method for assessing potential EJ impacts. However, it does recommend that an appropriate methodology be adopted and applied. ExxonMobil has a corporate socioeconomic standards-driven[7] process that assesses environmental, socioeconomic, and health considerations throughout a Project. As ExxonMobil's understanding of the local environment evolves during the Project lifecycle, and, if warranted, the EJ assessment may be updated.

For this Report, the EPA's EJScreen Tool Version 2.2 (EPA, 2023a) was used to assess demographic and environmental characteristics in areas crossed by or within the EJ Study Area (Figure 10-1). Use of the EJScreen Tool is intended to be a starting point in the identification of communities with potential EJ concerns. As discussed further in Section 10.1.2.4, EJ Indexes at or above the 80th percentile nationally were used as a starting point for identifying geographic areas that potentially warrant further consideration, analysis, or engagement with respect to potential EJ concerns.

10.1.2.1 Minority Populations

In accordance with the EPA's EJ guidance (EPA, 2016; EPA, 2022), this EJ Report uses demographic and socioeconomic data to assess levels of minority[8] population percentages present in the EJ Study Area and the broader Jefferson County. The U.S. Council on Environmental Quality (CEQ) states that "minority populations should be identified where either: (a) the minority population of the affected area exceeds 50% or (b) the minority population percentage of the affected area is *meaningfully greater* [emphasis added] than the minority population percentage in the general population or other appropriate unit of geographic analysis" (CEQ, 1997). The CEQ recommends using an "appropriate unit of geographic analysis" that does not "artificially dilute or inflate the affected minority population" (CEQ, 1997). While "meaningfully greater" is not explicitly defined in the CEQ's guidance, federal guidelines suggest that 10% greater than the reference population is considered a reasonable threshold for

[7] Managing socioeconomic impacts | ExxonMobil

[8] "Minority" was initially defined by the Federal Interagency Working Group on Environmental Justice in an appendix to the 1997 CEQ EJ Guidance as "individuals who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic" (CEQ, 1997).

"meaningfully greater" (EJ IWG and NEPA Committee, 2019). To identify minority populations for the CBGs in the EJ Study Area, Jefferson County was used as the reference population.

For this EJ Report, potential minority populations are identified as present in a CBG if it meets either of the following criteria:

- The percentage of minorities in the CBG is more than 50%; or
- The percentage of minorities in the CBG is at least 10% higher than that of Jefferson County.

10.1.2.2 Low-Income Populations

Utilizing EPA's EJ guidance (EPA, 2016; and EPA, 2022), this EJ Report evaluated socioeconomic data to assess levels of low-income percentages of populations present in the EJ Study Area and the broader Jefferson County. Guidelines for identifying low-income populations vary among federal and state agencies. Low-income populations can be identified using either (1) the U.S. Census Bureau poverty thresholds, (2) local data sources on poverty, or (3) the U.S. Department of Health and Human Services poverty guidelines. Additionally, low-income communities can be identified by using a "meaningfully greater" analysis, the percentage of *individuals* below the poverty level, the percentage of *households* below the poverty level, and/or the percentage of *families with children* below the poverty level (EJ IWG and NEPA Committee, 2019). The National Environmental Policy Act uses the "meaningfully greater" analysis to identify low-income populations.

For this Report, potential low-income populations are identified as present in a CBG if it meets the following criterion:

- The percentage of households below the poverty level in the CBG is greater than that of Jefferson County.

10.1.2.3 Additional Socioeconomic Indicators

Additional socioeconomic indicators measured by the EJScreen Tool include unemployment rate, percentage of population that is limited English speaking, percentage of population with less than high school education, percentage of population under age 5, percentage of population over age 64, a Demographic Index,[9] and a Supplemental Demographic Index.[10] Values for each of these indicators are compared between Jefferson County and each of the CBGs.

[9] The demographic index in EJScreen is a combination of percentage of low-income and percentage of minority, the 2 socioeconomic factors that were explicitly named in Executive Order 12898 on Environmental Justice. For each CBG, these two percentages are averaged together to derive the Demographic Index. The formula is as follows: demographic index = (% minority + % low-income) / 2.

[10] The supplemental demographic index in EJScreen is a combination of five socioeconomic factors averaged together for each CBG. The supplemental demographic index can provide an additional perspective on potential community vulnerability and may be more relevant for use in certain situations. The formula is as follows: supplemental demographic index = (% low-income + % unemployed + % less than high school education + % limited English speaking + low life expectancy) / 5. For BGs where low life expectancy data is missing, the formula will average the other four factors.

10.1.2.4 EPA EJScreen Tool EJ Indexes

There are 13 EJ Indexes in the EJScreen Tool corresponding to 13 environmental indicators, each combined with demographic indicators. An EJ Index can be used to characterize CBGs in terms of the combination of their low-income and people of color[11] populations and a given environmental indicator for the CBG. To calculate a CBG's EJ Index for a given environmental indicator, EJScreen multiplies the CBG's associated environmental indicator percentile by the average percentages of low-income and people of color (i.e., the Demographic Index) in the CBG.

Technical documentation for EJScreen recommends the use of an initial filter to promote consistency and as a pragmatic first step when interpreting screening results. The EPA has identified the 80th percentile filter as that initial starting point (i.e., an area with any of the 13 EJ Indexes at or above the 80th percentile may warrant further review).

EJScreen reports present the EJ Index percentiles both nationally and statewide. The national percentiles are the focus of this Report based on EPA technical guidance documents (EPA, 2016; EPA, 2022). National and state percentiles can be found in Appendix K-1, which includes the full EJScreen Community Reports for Jefferson County and each of the CBGs. Tables 1 and 2 in Appendix K-2 present individual demographic and environmental indicators that have resulted in a particular percentile.

10.1.3 EJ Assessment and Analysis

10.1.3.1 EPA EJScreen EJ Indexes

Of the 15 CBGs in the EJ Study Area, seven have EJ Indexes at or above the 80th percentile nationally. EJ Indexes with one or more CBGs with rankings at or above the 80th percentile nationally include PM2.5, Ozone, Diesel PM, Air Toxics Cancer Risk, Air Toxics Respiratory HI, Toxic Releases to Air, Superfund Proximity, Risk Management Program Facility Proximity, Hazardous Waste Proximity and Wastewater Discharge. The most common EJ Indexes at or above the 80th percentile nationally in the EJ Study Area are Air Toxics Cancer Risk and Toxic Releases to Air, each present above the 80th percentile nationally in five CBGs.

Table 10-1 summarizes the EJ Index national percentile rankings for Jefferson County and each of the CBGs in the EJ Study Area. Values at or above the 80th percentile nationally are shown in bold and the cells are shaded dark gray.

[11] In EJScreen, "low-income" is defined by the EPA as the percentage of a block group's population in households where the household income is less than or equal to twice the federal "poverty level." "People of color" are defined by the EPA as the percentage of individuals in a block group who list their racial status as a race other than white alone and/or list their ethnicity as Hispanic or Latino (i.e., all people other than non-Hispanic white-alone individuals, where the word "alone" in this case indicates that the person is of a single race, not multiracial) (EPA, 2022; EPA, 2023b).

Table 10-1: EJScreen EJ Index National Percentile Ranking Results for Jefferson County and EJ Study Area Census Block Groups

Selected Variables	Jefferson County	CT 13.03 BG 2	CT 112.04 BG 1	CT 112.04 BG 2	CT 112.04 BG 3	CT 112.05 BG 1	CT 112.05 BG 2	CT 113.04 BG 1	CT 113.04 BG 2	CT 113.04 BG 3	CT 114.01 BG 1	CT 114.01 BG 3	CT 114.02 BG 1	CT 114.02 BG 2	CT 9802 BG 1	CT 9803 BG 1
PM2.5	**82nd**	**83rd**	50th	54th	49th	46th	38th	70th	31st	**86th**	29th	65th	71st	72nd	**94th**	72nd
Ozone	**80th**	79th	49th	53rd	48th	45th	38th	69th	31st	**86th**	24th	57th	62nd	64th	**95th**	72nd
Diesel PM	75th	79th	43rd	46th	42nd	40th	34th	43rd	16th	60th	16th	42nd	46th	47th	**88th**	49th
Air Toxics Cancer Risk	**96th**	**97th**	70th	73rd	69th	67th	63rd	**88th**	59th	**98th**	54th	70th	74th	75th	**99th**	**89th**
Air Toxics Respiratory HI	**83rd**	**88th**	60th	63rd	59th	56th	50th	57th	33rd	73rd	44th	76th	**81st**	**81st**	**97th**	58th
Toxic Releases to Air	**92nd**	**93rd**	62nd	66th	60th	57th	49th	**83rd**	41st	**96th**	39th	79th	**84th**	**85th**	**99th**	**85th**
Traffic Proximity	72nd	62nd	37th	46th	28th	38th	33rd	39th	6th	27th	11th	40th	47th	39th	78th	18th
Lead Paint	72nd	68th	0	30th	31st	45th	24th	30th	22nd	72nd	21st	32nd	60th	50th	0	0
Superfund Proximity	75th	67th	50th	53rd	46th	45th	40th	48th	21st	77th	11th	38th	46th	48th	**91st**	65th
Risk Management Program Facility Proximity	**86th**	**83rd**	59th	62nd	57th	56th	49th	69th	34th	**91st**	18th	42nd	66th	**80th**	**99th**	77th
Hazardous Waste Proximity	74th	63rd	46th	45th	42nd	47th	37th	60th	15th	73rd	12th	32nd	58th	69th	**95th**	59th
Underground Storage Tanks	76th	74th	42nd	45th	31st	36th	34th	52nd	25th	58th	25th	44th	48th	50th	74th	58th
Wastewater Discharge	78th	**92nd**	24th	25th	29th	26th	14th	54th	37th	**94th**	18th	40th	56th	68th	68th	76th

Data source: EPA, 2023a

Values at or above the 80th percentile are shown in bold and shaded dark gray.

10.1.3.2 Demographic Indicators

This Report considers a subset of EJScreen demographic indicators for the CBGs in the EJ Study Area. The full EJScreen reports for each of the CBGs are provided in Appendix K-1. The state and national percentile rankings tables are provided in Appendix K-2. Table 10-2 summarizes the percentage values for demographic indicators for each CBG and for Jefferson County. Table 10-2 uses the combined “meaningfully greater” and 50% threshold methodologies to identify the CBGs that may warrant further evaluation on the basis of minority population percentages. For all other demographic indicators, Table 10-2 uses a direct comparison of the value for the CBG and that of Jefferson County. CBG values exceeding these comparison thresholds are shown in bold and the cell is shaded dark gray. Six of the 15 CBGs have populations of people of color greater than 50%. Both CT 113.04 BG 3 and CT 9802 BG 1 also have low-income populations higher than the Jefferson County reference population. The Demographic Index (an average of the percentage of low-income and percentage of people of color) is greater than that of Jefferson County percentage and above 50% in three of the 15 CBGs.

Table 10-2: EJScreen Demographic Indicator Percentages for Jefferson County and Census Block Groups in the EJ Study Area

Selected Variables	Jefferson County	CT 13.03 BG 2	CT 112.04 BG 1	CT 112.04 BG 2	CT 112.04 BG 3	CT 112.05 BG 1	CT 112.05 BG 2	CT 113.04 BG 1	CT 113.04 BG 2	CT 113.04 BG 3	CT 114.01 BG 1	CT 114.01 BG 3	CT 114.02 BG 1	CT 114.02 BG 2	CT 9802 BG 1	CT 9803 BG 1
Demographic Index	50%	**54%**	17%	19%	17%	15%	12%	35%	9%	**63%**	9%	31%	36%	38%	**86%**	36%
Supplemental Demographic Index	17%	17%	8%	11%	10%	10%	6%	15%	8%	**20%**	10%	10%	8%	11%	**31%**	5%
People of Color	61%	**81%**	27%	9%	15%	6%	18%	45%	4%	**76%**	4%	40%	**56%**	**60%**	**71%**	**72%**
Low-Income	38%	26%	8%	30%	18%	24%	6%	25%	15%	**50%**	14%	22%	17%	15%	**100%**	0%
Unemployment Rate	6%	**35%**	3%	0%	5%	3%	**7%**	2%	2%	0%	**11%**	1%	0%	15%	0%	0%
Limited English Speaking	5%	0%	3%	0%	0%	0%	0%	**19%**	0%	0%	0%	0%	0%	5%	0%	0%
Population with Less than High School Education	15%	3%	9%	7%	6%	5%	0%	9%	1%	**26%**	7%	11%	3%	1%	**24%**	**22%**
Population Under Age 5	7%	3%	0%	**13%**	6%	0%	0%	6%	7%	0%	6%	0%	0%	7%	0%	0%
Population Over Age 64	14%	**23%**	7%	**21%**	**18%**	6%	**18%**	14%	7%	4%	**17%**	**22%**	13%	14%	3%	3%
Low Life Expectancy	21%	21%	19%	19%	19%	19%	19%	**22%**	**22%**	**22%**	19%	19%	19%	19%	N/A	N/A

Data Source: EPA, 2023a

CBG percentages above the Jefferson County percentages (or above 50% in the case of people of color) are shown in bold and the cell is shaded dark gray.

10.1.3.3 Critical Service Gaps

EJScreen includes indicators for critical service gaps such as broadband internet subscription gaps, lack of health insurance,[12] housing burden, transportation access, and presence of food deserts.[13] Descriptions of the indicators for these EJScreen layers are as follows:

- Broadband gaps refer to the percentage of households with a broadband internet subscription as reported in the Census Bureau's American Community Survey (ACS) five-year summary estimates (Figure 10-2).
- Lack of health insurance is the percentage of all persons without health insurance coverage as reported in the Census Bureau's ACS data (Figure 10-3).
- Housing burden is a percentile related to housing cost, which is the percentage of households that are both earning less than 80% of Housing and Urban Development's Area Median Family Income and are spending more than 30% of their income on housing costs (Climate and Economic Justice Screening Tool [CEQ, 2023]) (Figure 10-4).
- Transportation access is an average of four transportation-related indicator percentiles: transportation cost burden, national walkability index, percentage of households with no vehicle available, and mean commute time to work (Climate and Economic Justice Screening Tool) (Figure 10-5).
- Food desert tracts are those that are both low-income and "low-access," the latter of which is identified as tracts that are separated from affordable and nutritious foods by a distance of 1 mile for urban areas and 10 miles for rural areas, as reported by the U.S. Department of Agriculture (Figure 10-6).

Broadband internet subscription gaps at or above the 80th percentile occur within the portion of the EJ Study Area between Interstate 10 (I-10) and West Port Arthur Road. Lack of health insurance surpasses the 80th percentile for the entire portion of the Project Footprint from the eastern end of the Project Footprint near Central Gardens up until just east of I-10. Housing burden does not exceed the 80th percentile in the EJ Study Area. Transportation access burdens occur above the 80th percentile in only two of the CBGs: CT 9803 BG 1 and CT 9802 BG 1. These two CBGs contain correctional facilities, so these rankings are as expected. Food desert designation does not appear within the EJ Study Area.

Figures 10-2 through 10-6 show the graphical data from the EJScreen Tool for each of the above critical services gaps.

[12] Percentage of all persons without Health Insurance Coverage as reported in the Census Bureau's ACS data.

[13] Food desert tracts are low-income and low-access CTs with limited access to affordable and nutritious foods, measured at 1 mile distance for urban areas and 10 miles distance for rural areas, as reported by the U.S. Department of Agriculture.

Figure 10-2: Critical Service Gaps—Broadband Gaps in the EJ Study Area

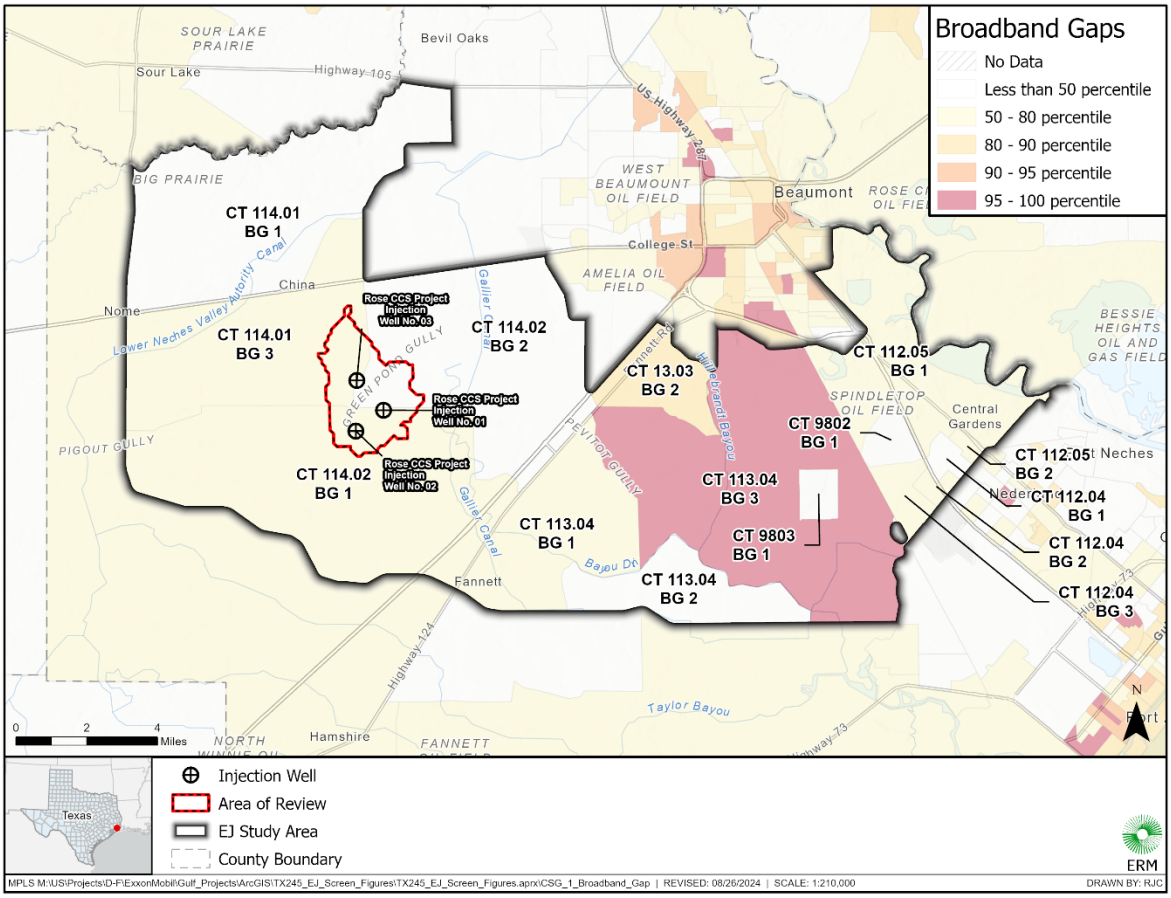


Figure 10-3: Critical Service Gaps—Lack of Health Insurance in the EJ Study Area

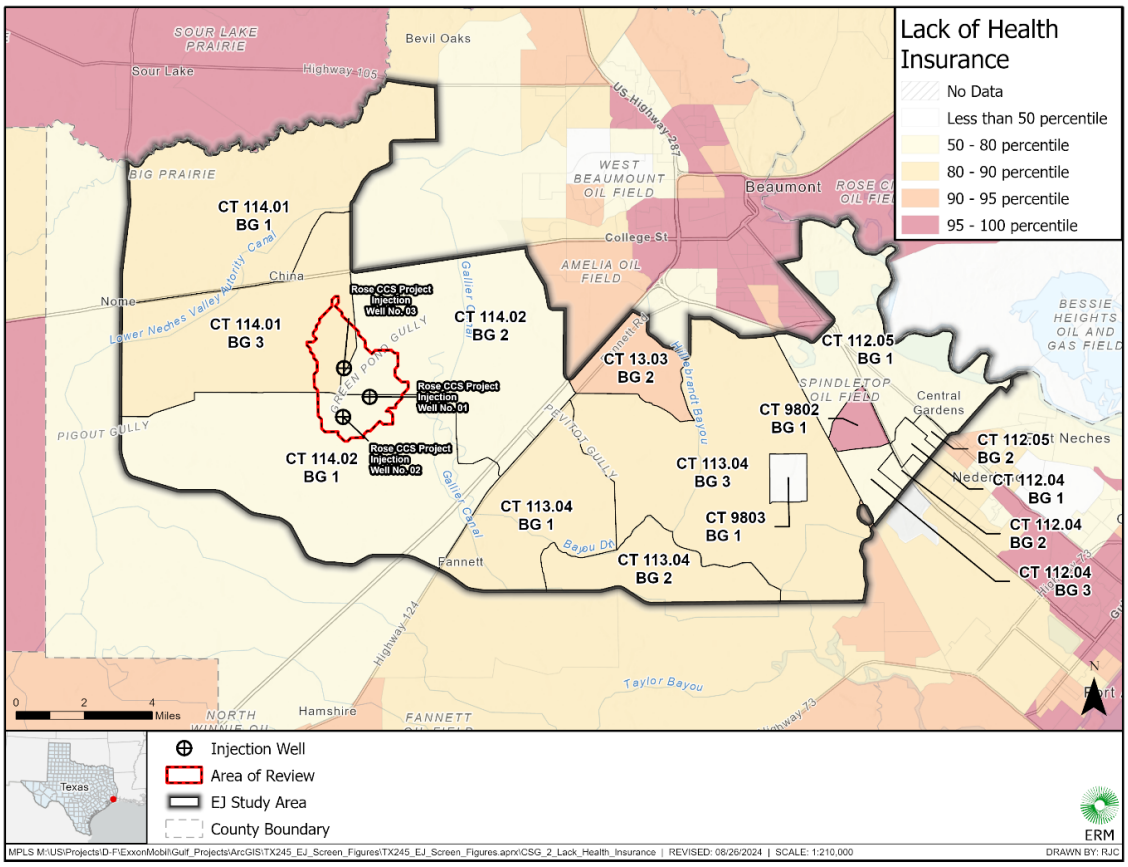


Figure 10-4: Critical Service Gaps—Housing Burden in the EJ Study Area

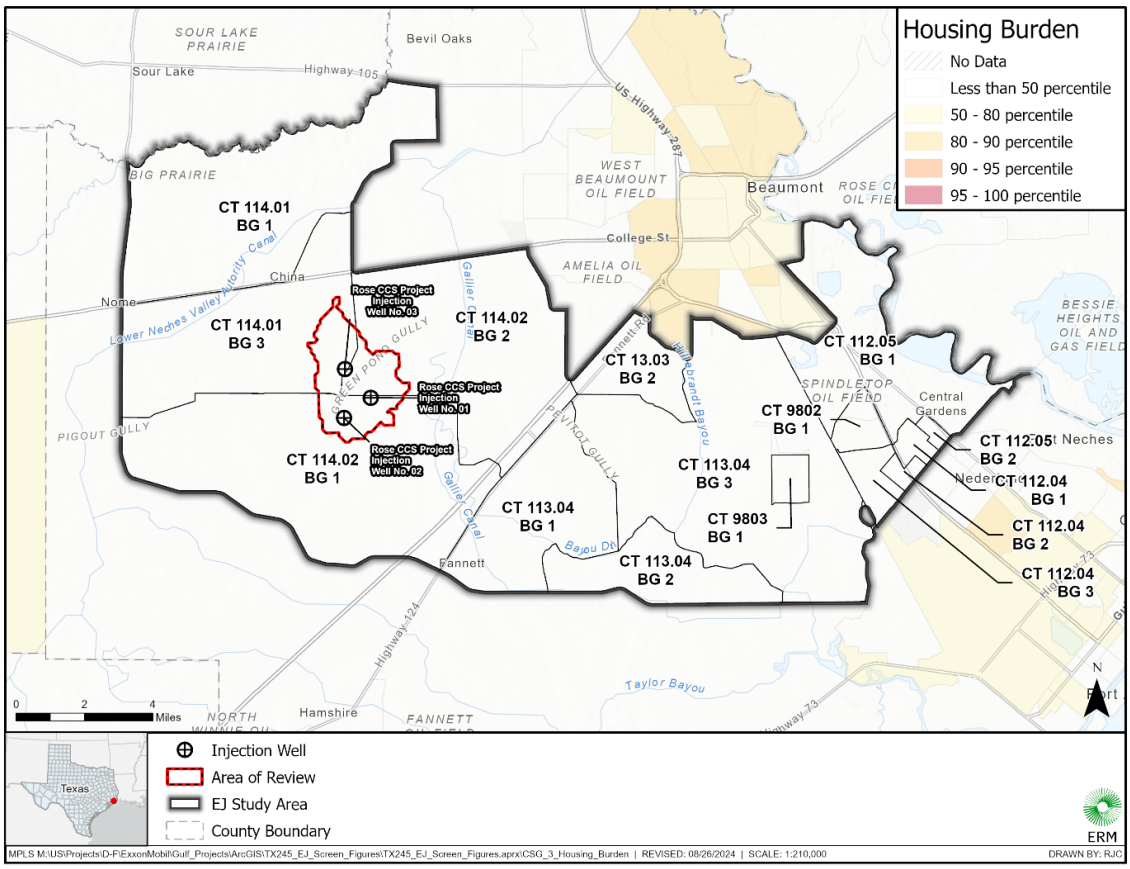


Figure 10-5: Critical Service Gaps—Transportation Access in the EJ Study Area

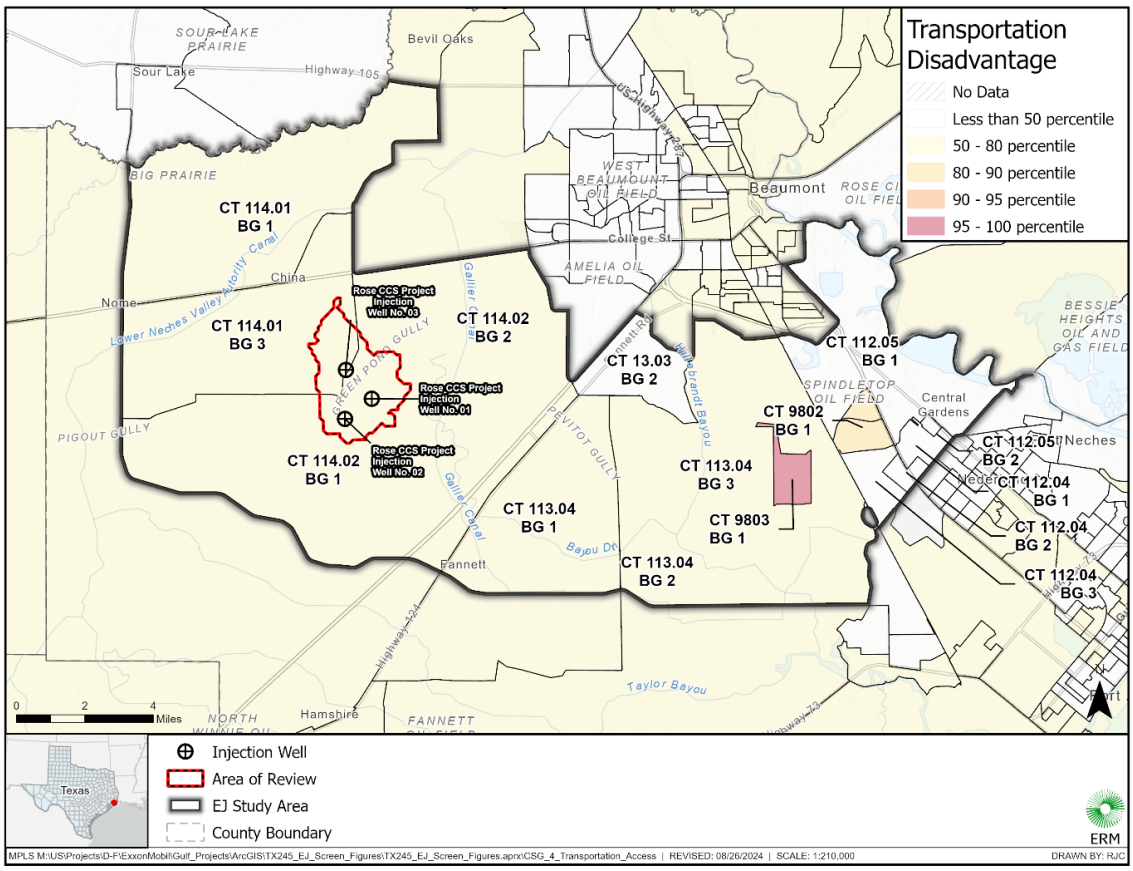
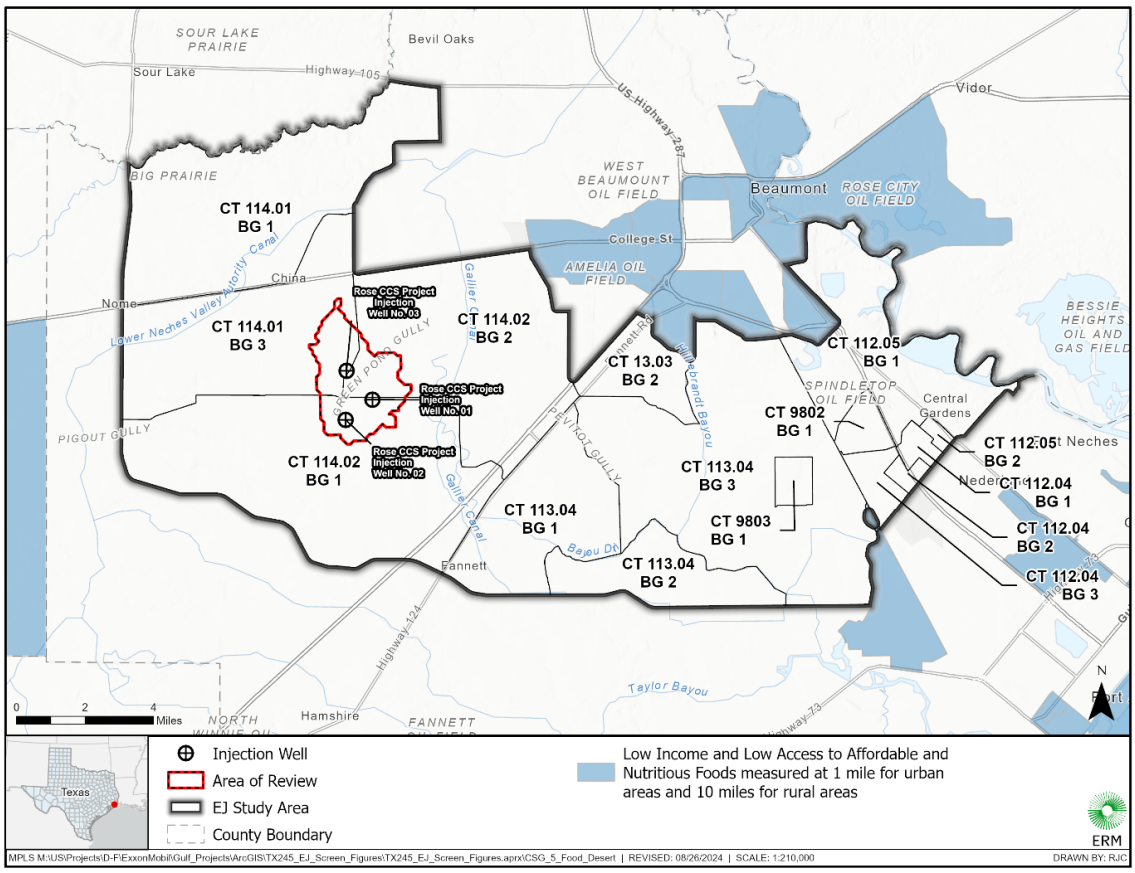


Figure 10-6: Critical Service Gaps—Food Deserts in the EJ Study Area



10.2 EJ Communities of Concern

The EJ assessment revealed a number of CBGs that are most likely to contain communities with potential EJ concerns based on the EJScreen environmental indices, applying EPA's recommended threshold of focusing on areas in the 80th percentile or higher. With respect to environmental indicators, CBGs CT 13.03 BG 2, CT 113.04 BG 3, and CT 9802 BG 1 are in the 80th percentile or higher on the most variables (each in the 80th percentile or higher for six or more environmental variables, and for four or more demographic variables at a regional or broader project level). These census block groups do not correspond however to communities identified within the AOR (Figure 10-1).

At a local level, the Cheek community was identified as a community within, and in proximity, to the AOR. This community is not located in one of the aforementioned CBGs. However, use of the EJScreen tool is a starting point to understand what communities might have potential EJ concerns. Thus, the tool may not highlight all communities with potential for such concerns. In this sense, through ground-truthing and stakeholder engagement conducted to date, the Cheek community has been identified as a community that has expressed environmental concerns with the project. The Project has focused engagement efforts in the community and the project area to better understand local experiences and impressions regarding CCS projects in the area and

community-specific concerns. The feedback provided via these engagements has resulted in the development of plans for initial investments in Emergency Response, Community, and Education as detailed in Section 10.3.3.

10.3 Preliminary EJ and Stakeholder Engagement

While there are inherent risks in any type of development or operation, the Project seeks to avoid identified risks, mitigate remaining risks to acceptable levels, and to remedy the potential impacts. ExxonMobil uses core processes and internal frameworks to systematically identify, assess, manage, and monitor environmental and socioeconomic risks, opportunities and impacts throughout the lifecycle of the Project. Community feedback, scientific understanding, and other due-diligence information is considered to enable safer and responsible operations for the Project. ExxonMobil periodically update these assessments to reflect changes to operational complexity or socioeconomic sensitivities and amend management plans, as needed.

10.3.1 Stakeholder Engagement

The Project seeks to work collaboratively and transparently with local communities to promote positive, long-term relationships. ExxonMobil is consulting with local groups and individuals regularly and seek to have our stakeholders represented as community concerns are discussed and decisions are made. Our engagement process is continually tailored to be locally and culturally appropriate and provide accessible, inclusive, and effective channels for exchanging information and proactively identifying issues or concerns.

ExxonMobil has developed an initial Stakeholder Engagement Plan, which guides the management of the socioeconomic dynamics that may impact—or be impacted by—the Project. Considerations related to potential communities warranting further assessment from an EJ perspective, local economic development, workforce development, and grievances are routinely measured, assessed, and used to inform stakeholder engagement and impact mitigation strategies throughout the Project's lifecycle. Further detail on the project's Community Grievance Mechanism (CGM) is provided in Section 10.3.2.

ExxonMobil has been working to engage and inform local community individuals, community leaders, and elected officials on topics related to CCS and the overall Project. Table 10-3 provides a non-exhaustive summary of the Project's community engagement activities conducted to-date, which includes formats such as, but not limited to, community gatherings, individual meetings, and open houses. In addition to the listed community engagements, ongoing engagements are being conducted with elected officials, and other relevant stakeholders to provide project updates. Community engagement will be continuous throughout the lifecycle of the project. As involvement with the local community grows, the Stakeholder Engagement Plan will continue to be refreshed.

Table 10-3: Summary of Community Engagement Activities to Date

Date	Stakeholder	Engagement Activity
May 2022–Present	27 landowners in the China, TX area	ExxonMobil engaged with landowners to discuss and enter into lease agreements

Date	Stakeholder	Engagement Activity
Jul–Aug 2023	Southeast TX area including Jefferson County communities	ExxonMobil performed a Sentiment Survey addressing views on CCS and pipelines. Out of 150 completed interviews, 43 were in Jefferson County (8 in Chambers, 31 in Hardin, 38 in Harris and 30 in Liberty County)
Sep 2023	Local faith-based leaders (New Bethel Missionary Baptist Church of Cheek, St. Mary, Fannett, St. Martin de Porres)	ExxonMobil communicated an outline of upcoming activities and posted flyers on their community poster boards
Sep 2023	Local neighborhoods near well site (Bead Farm Co #1)	ExxonMobil conducted door-to-door canvasing to provide community members with information regarding the upcoming activities and to answer any questions; provided door hanger with webpage link for additional details
Oct 2023	ExxonMobil Beaumont Community Advisory Panel	ExxonMobil provided an overview of the Low Carbon Solutions business and the Project
Nov 2023	Beaumont Independent School District	ExxonMobil hosted and participated in the Beaumont ISD Family Science, Technology, Engineering, and Math (STEM) nights event, with over 1,000 community members; shared information about STEM activities which included an interactive CCS display
2023–2024	Beaumont Fire Department, Port Arthur Fire Department	ExxonMobil sponsored the Beaumont Fire Department, Beaumont Fire & Rescue, and Port Arthur Fire Department participation in HazMat Liquid & CO2 Pipeline and Industrial Fire Emergencies training at Texas A&M Engineering Extension Service
Jan–Feb 2024	LA, MS and Southeast TX, including Jefferson County communities	ExxonMobil performed a Sentiment Survey addressing views on CCS and pipelines. Out of 312 respondents, 101 were in Texas, including Jefferson County
June 2024	Young Men's Business League	ExxonMobil conducted focus groups and one on ones with the

Date	Stakeholder	Engagement Activity
	Nutrition & Services for Seniors	listed organizations in June 2024 as part of the development of a Local Economic Development Plan for the Project. Participants included economic development organizations, chambers of commerce, industry associations, nonprofit community organizations, K-12 program providers, universities, representatives from the local government, coastal restoration representatives, and suppliers from the Project area
	Southeast Texas Foodbank	
	Jefferson County Long Term Recovery Group	
	Jefferson County Office of Emergency Management and Homeland Security	
	Golden Triangle Minority Business Council	
	Southeast Texas Economic Development Foundation	
	Industry of Southeast Texas	
	Greater Beaumont Chamber of Commerce	
	Local Government	
	Golden Triangle Texas Alliance for Minorities in Engineering	
	Ducks Unlimited	
	Primoris Services Corporation	
	Lamar University	
	Lamar Institute of Technology	
Jun 2024	Cheek, China, and surrounding communities to the Project (Martel Heights, Diamond D Ranch Estates, Pine Island Estates)	ExxonMobil hosted an open house with approximately 150 community members in attendance. Information booths included the process of carbon sequestration, the proposed Project, landowners' leases, and upcoming operations
Jul 2024	Beaumont Independent School District area	ExxonMobil sponsored students to attend the Tapia STEM camps

Date	Stakeholder	Engagement Activity
Jul 2024	Diamond D Ranch Estates & Pine Island Estates Homeowner's Association (invited by community to Homeowner's Association meeting, ~80 community members)	ExxonMobil provided project and CCS overview and responded to questions related to CO2 safety, pipelines, drilling, landowner leases, permitting, and carbon sequestration process.
Aug 2024	Cheek Community Engagement Meeting (4 community members)	ExxonMobil attended a small group meeting for continuous engagement, gathering recommendations larger group meetings and community questions for company consideration
Aug 2024	Cheek Community Engagement Meeting (~100 community members)	ExxonMobil was invited to listen to community feedback and concerns and provide responses to community member questions related to community safety and emergency response, impact on minority community, and potential project impact on land and home values
2024	Emergency Service Districts 3 and 4	ExxonMobil is in continuous engagement with local Emergency Service District chiefs on Emergency Response matters, local needs/gaps, and potential ways to support.
April 2024–Present	Over 150 landowners and their attorneys/representatives	ExxonMobil conducted telephone conversations, in-person meetings (individual and small group settings)

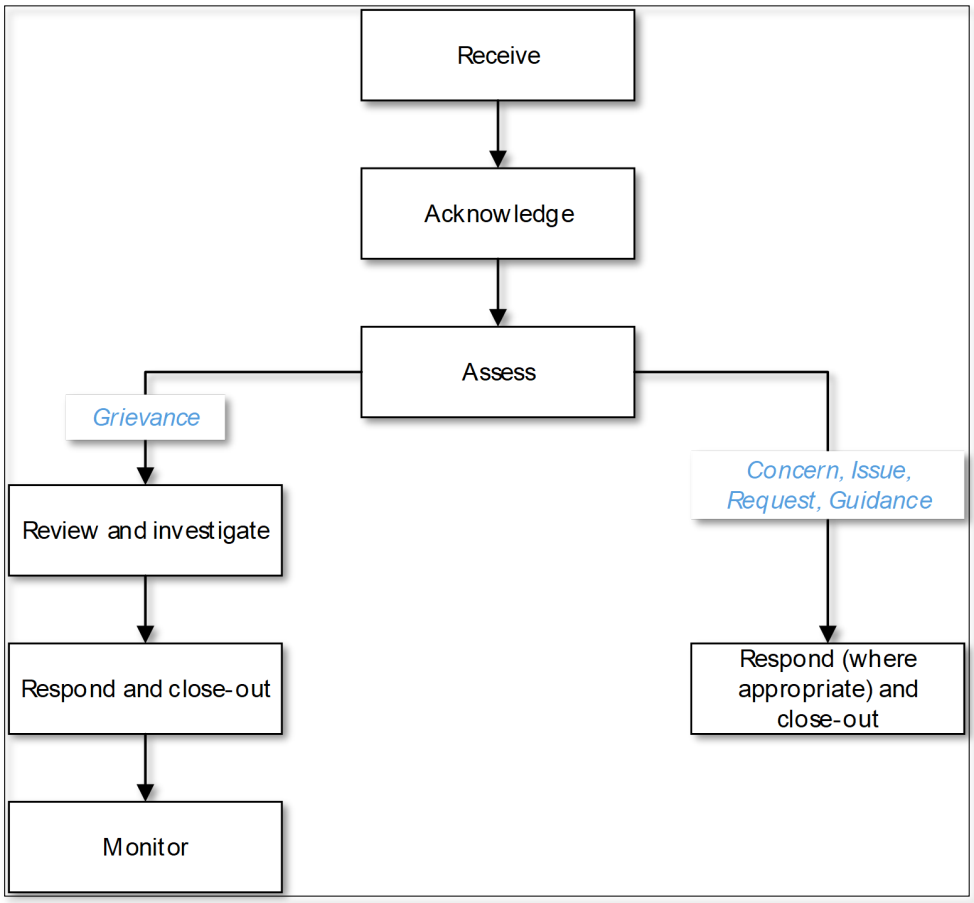
10.3.2 Community Grievance Mechanism

ExxonMobil has developed a CGM, which receives complaints, concerns, issues, requests, or other feedback (collectively termed "input" herein) related to the Project and allows for response to this input in a consistent, transparent, and timely manner. The CGM will be active throughout the lifecycle of the project. The objectives of the CGM are to:

- Provide an accessible mechanism for stakeholders to provide input to the Project team;
- Facilitate the Project's processing of stakeholder input such that the input is acknowledged, tracked, and addressed in a timely manner respecting confidentiality;
- Continuously improve Project performance based on consideration of stakeholder input provided through the CGM; and
- Demonstrate commitment to meaningful stakeholder engagement and respect for stakeholder input.

The Project CGM is aligned with International Petroleum Industry Environmental Conservation Association best practices, as shown in Figure 10-7.

Figure 10-7: Project CGM Process



The CGM is structured so that stakeholders may submit input in multiple ways. A CGM log is being used to record all engagements with stakeholders and all input received from stakeholders. This allows for analysis of trends in stakeholder interest and concern—which can help to design further engagement programs and activities—and tracking of Project responses to stakeholder input.

10.3.3 Stakeholder Feedback

Stakeholder feedback is being received through the CGM, initial field work for the development of the Project Local Economic Development Plan, and continuous engagement. As a result of this feedback, ExxonMobil has committed more than $1 million USD to support Safety and Emergency Response equipment and training, Community, and Education to the Cheek community (Table 10-4). In addition, ExxonMobil plans to commit an additional $5 million USD in community investment to Cheek and the surrounding community to further support identified needs through the first 10 years of injection. Allocation of funds will be achieved through a diverse committee comprised of local representatives tasked with identifying and prioritizing opportunities to improve the community. Appendix K-3 presents a summary of feedback and actions being taken by the Project in response to community feedback. This section highlights

some common concerns of stakeholders in response to the Project and how ExxonMobil is responding accordingly to the feedback provided.

Table 10-4: Initial planned investment in Emergency Response, Community, and Education

Topic	Scope	Investment (USD)
Emergency Response	Reimbursement to local ESD departments to obtain 10 radios, chargers, 20 batteries, brush buggy, and a brush truck	$742,000
	Sponsor 6 local firefighters to attend September 2024 HazMat Liquid & CO2 Pipeline and Industrial Fire Emergencies training at Texas A&M Engineering Extension Service (TEEX).	$12,000
	Donation to Jefferson County Long Term Recovery Group	$25,000
Community	Funding support for improvements to a Cheek community gathering area	$250,000
	Implementation of construction noise, environmental monitoring and community engagement support	$171,000
Education	Endowed scholarship at Lamar Institute of Technology for Cheek community residents	$25,000
Planned Initial Total		$1,225,000

10.3.3.1 Safety and Emergency Response

Section 146.94 of the regulations provides for an emergency and remedial response plan to describe the actions to be taken to address movement of the injection or formation fluids that may cause an endangerment to an Underground Source of Drinking Water (USDW). Emergency response concerns have been shared by the community during the engagements and field work conducted to date. Emergency Service Districts (ESD) rely on volunteers; however, this system falters when volunteers do not appear when they are needed. Potential causes include conflicts with commitments to full-time jobs to support their families or other demands that prevent them from being available. As an example, community members shared the story of a house burning down in the community prior to the fire department arriving. In response to emergency response concerns, the Project is in discussion with local ESDs (ESD 3 and 4) to consider grants to pay for full time staff in addition to committing to purchase of equipment needed by these departments to respond to emergencies that may include a vehicle(s) for oxygen reduced environments and carbon dioxide (CO_2) monitors. Community feedback has been received regarding the implementation of additional safeguards for CO_2 leaks. Although not required by the Underground Injection Control regulations under the Safe Water Drinking Act as unrelated to infiltration of the USDW, the Project is nonetheless considering methods/mechanisms for early detection of CO_2 that would allow for community monitoring/awareness.

Similarly, in support of local emergency response efforts, ExxonMobil is sponsoring six local firefighters to participate in the September 2024 HazMat Liquid & CO_2 Pipeline and Industrial Fire Emergencies training at Texas A&M Engineering Extension Service. Recruitment of additional firefighters for future training sessions is ongoing. As emergency response plans

continue to evolve, community input will be sought regarding notification procedures, additional potential monitoring sites, and other community priorities.

10.3.3.2 Community Infrastructure

Based on feedback received and fieldwork conducted to date, the community is looking for investment opportunities to improve quality of life. Items cited included inadequate facilities and infrastructure to address prevalent health issues, food insecurity among seniors and youth, broadband access gaps, support needed for improvements/connections to sewer, natural gas, and development of recreational parks. The Project intends to continue engagement on a local level to further refine and identify near term and long-term ways to support through mutually agreed initiatives with the community.

10.3.3.3 Format for Engagements

Engagement formats should be tailored to respective communities and audiences. An initial format of an open house was utilized to provide information on the process of carbon sequestration, the proposed Project, landowners' leases, and upcoming operations. ExxonMobil received community feedback that the format utilized for this engagement was not preferred, nor the most adequate for the community to be able to effectively raise their questions and concerns. A townhall style format with formal presentation covering all these topics and allowing time for questions and answers was requested by multiple community members. In response to this suggestion, ExxonMobil modified its approach and has participated in two community meetings with the requested format.

10.3.3.4 Noise

A community resident raised a grievance related to noise and vibrations during appraisal well drilling operations. The Project developed and implemented a noise study and noise/vibration nuisance response plan. This response plan included a monitoring program for other drilling operations, drilling activities planned to avoid louder activities at night, and adjustments to the configuration of the well pad that increased the distance of drilling equipment from the community.

10.3.3.5 Lease Agreements

A limited number of community members that were approached with pore space agreements expressed concerns regarding surface rights being encumbered, which would inhibit their ability to further invest in their properties. To address this concern, the Project has updated the agreements to remove all surface rights except for those required for emergencies. The Project is engaging with the community to update leases previously executed and is utilizing this updated agreement template for all new leases.

10.4 Next Steps

The EJ analysis and assessment for the Project will continue to be refined and updated throughout the lifecycle of the same as appropriate. As highlighted in Appendix K-3, activities are underway to address specific community feedback. As next steps the following project activities are being planned:

- Continue to gather feedback via CGM and community engagements;
- Ongoing response to community concerns and grievances;

- Continued refinement of management and mitigation plans based on the community feedback; and
- Formation of a diverse committee comprised of local representatives responsible for identifying and prioritizing opportunities to improve the community.

Once the community and ExxonMobil have mutually agreed upon programs and/or benefits, a phased plan for implementation will be developed and enacted.

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Appendix A Project Maps

CONFIDENTIAL BUSINESS INFORMATION

DRAWN BY: GIS , SCALE: 1:32,000 when printed at 11x17 , REVISED: 03/27/2025 , M:\Projects\D-F\ExxonMobil\0672315 ExxonMobil CCS ETX\APRX\Rose\Site_Char_Figures\Site_Char_Figures_March2025.aprx, FILE:

China, TX

USDW Monitoring Well No.01

In-Zone Monitoring Well No. 01

Rose CCS Project Injection Well No. 03

Above-Zone Monitoring Well No. 1 Bead Farm Co. #1

USDW Monitoring Well No.02

Rose CCS Project Injection Well No. 01

Rose CCS Project Injection Well No. 02

USDW Monitoring Well No.03

Highway 90

Avenue D

S China Rd

Theriot Rd

Green Pond Gully Rd

Bond Rd

Ponderosa Trl

Lana Ln

Pine Island Levee Rd

Boyt Rd

Lawhon Rd

3rd Ave

Source: Esri - World Topographic Map; NAD 1983 StatePlane Texas South FIPS 4205 Feet

Legend

- USDW Monitoring Well
- In-Zone Monitoring Well
- Above-Zone Monitoring Well No. 1 Bead Farm Co. #1
- Artificial Penetrations
- TWDB Wells in AoR
- Injection Well
- Maximum CO2 Plume
- Maximum Pressure Front
- Area of Review
- Directional Well Bottom-Hole Location
- Directional Well Surface-Hole Location
- Horizontal/Directional Line
- Modeled Fault
- Main Road
- Local Road

Structure

- Residential
- Commercial
- Government
- Education
- Other

Water Body

- Lake/Pond
- Swamp/Marsh

Wetland/Agriculture

- Agriculture, Swamp, Bog, Prairie
- River

Figure A-1
Site Overview and Area of Review
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

Appendix B Site Characterization Figures

Appendix B – Site Characterization Figures

CONFIDENTIAL BUSINESS INFORMATION FOR THE
NEXT 104 PAGES

105° 100° 95° 90° 85° 80°

35° 30° 25°

COLORADO KANSAS MISSOURI KENTUCKY VIRGINIA

ARKANSAS TENNESSEE NORTH CAROLINA

OKLAHOMA Appalachian Mountains SOUTH CAROLINA

Arbuckle uplift Ouachita Mountains/uplift Mississippi embayment State Line fault zone GEORGIA

NEW MEXICO Monroe uplift Gilbertan - Pickens fault zone

TEXAS Central Texas platform East Texas Basin Sabine uplift Jackson dome ALABAMA ATLANTIC OCEAN

La Salle arch MISSISSIPPI

Balcones fault zone Llano uplift Luling - Mexia - Talco fault zone Apalachicola embayment

Wiggins uplift LOUISIANA

Houston embayment

Maverick Basin FLORIDA

MEXICO GULF OF MEXICO

Rio Grande embayment

Elevation from U.S. Geological Survey
National Elevation Dataset digital elevation
model, 2009, 90-meter resolution
Albers Equal Area Projection
Central meridian 94°00'W

0 150 300 450 MILES
0 150 300 450 KILOMETERS



EXPLANATION

- Approximate location of the Rose Project Area
- Ouachita orogenic belt
- Peripheral fault zones
- Embayment
- San Marcos arch
- Uplift
- Lower Cretaceous reef trend
- U.S. Gulf Coast Study Area by USGS
- State-waters boundary

Source: Roberts-Ashby et al., 2014 (https://pubs.usgs.gov/publication/ofr20121024H)

Figure B-1
Regional Geologic System Map
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions
Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

ERA	SYSTEM	SERIES	SW — SE: SOUTH COASTAL PLAIN (includes Rio Grande embayment)	SW — SE: CENTRAL COASTAL PLAIN (includes San Marcos arch)	SW — SE: EAST COASTAL PLAIN (includes East Texas Basin, Sabine uplift, and Houston embayment)
CENOZOIC	Quaternary	Holocene	Alluvium	Alluvium	Alluvium
		Pleistocene	Beaumont Formation	Beaumont Formation	Beaumont Formation
			Lissie Formation	Lissie Formation; Montgomery Formation; Bentley Formation	Lissie Formation; Montgomery Formation; Bentley Formation
			Willis Sand	Willis Sand	Willis Sand
	Tertiary	Pliocene	Goliad Sand	Goliad Sand	Goliad Sand
		Miocene	Fleming Formation	Fleming Formation	Fleming Formation
			Oakville Sandstone	Oakville Sandstone	Oakville Sandstone
			Catahoula Tuff; subsurface: Upper part of Catahoula Tuff, Anahuac Formation, Frio Formation	Catahoula Tuff or Sandstone; subsurface: Upper part of Catahoula Tuff or Ss., Anahuac Formation, Frio Formation	Catahoula Sandstone; subsurface: Upper part of Catahoula Ss., Anahuac Formation, Frio Formation
		Oligocene	Frio Clay; *Vicksburg Fm.* (subsurface)	Frio Clay; *Vicksburg Fm.* (subsurface)	*Vicksburg Fm.* (subsurface)
			Jackson Group	Jackson Group; Whitsett Fm., Manning Clay, Wellborn Ss., Caddell Fm.; Jackson Group	Jackson Group
		Eocene	Claiborne Group: Yegua Formation; Laredo Formation, Cook Mountain Fm., Sparta Sand; El Pico Clay, Weches Formation, Queen City Sand; Bigford Formation, Reklaw Formation; Carrizo Sand	Claiborne Group: Yegua Formation; Cook Mountain Formation; Sparta Sand; Weches Formation; Queen City Sand; Reklaw Formation; Carrizo Sand	Claiborne Group: Yegua Formation; Cook Mountain Formation; Sparta Sand; Weches Formation; Queen City Sand; Reklaw Formation; Carrizo Sand
			Wilcox Group: Indio Formation	Wilcox Group: Calvert Bluff Formation; Simsboro Formation; Hooper Formation	Wilcox Group: Calvert Bluff Formation; Simsboro Formation; Hooper Formation
		Paleocene	Midway Group	Midway Group	Midway Group
MESOZOIC	Cretaceous	Gulfian	Navarro Group: Escondido Formation; Olmos Formation	Navarro Group: Escondido Formation, Kemp Clay; Olmos Formation, Corsicana Marl, Nacatoch Sand, Neylandville Marl	Navarro Group: Kemp Clay, Corsicana Marl, Nacatoch Sand, Neylandville Marl
			Taylor Marl: Upper part Taylor Marl; San Miguel Formation, Anacacho Limestone; Upson Clay	Taylor Marl: Upper part Taylor Marl; Anacacho Limestone: Pecan Gap Chalk, Wolfe City Sand, Lower part Taylor Marl	Taylor Marl: Upper part Taylor Marl; Pecan Gap Chalk, Wolfe City Sand, Lower part Taylor Marl; Annona Chalk

Confining & Injection Zones

EXPLANATION

ABSENT OR HIATUS

ABBREVIATION OF LITHOSTRATIGRAPHIC UNITS

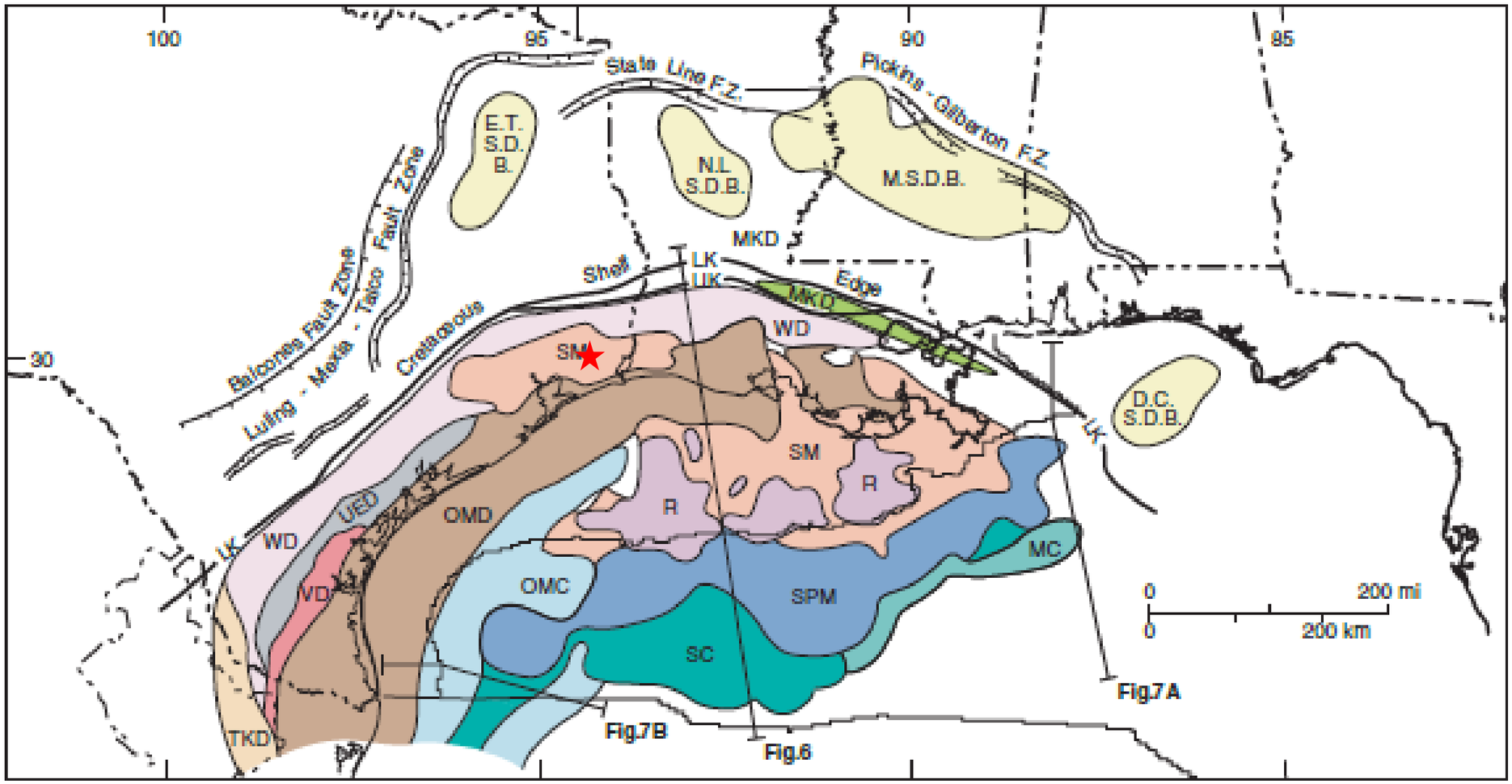
Ss., Sandstone — Sd., Sand
Fm., Formation — Ls., Limestone
Mbr., Member — Sh., Shale

Vicksburg Fm., ITALICS INDICATE INFORMAL GEOLOGIC NAMES

Source: Baker Jr., E. T., 1995, Stratigraphic nomenclature and geologic sections of the Gulf Coastal Plain of Texas, Open-File Report 94-461,USGS, https://doi.org/10.3133/ofr94461

Figure B-2
Gulf Basin Stratigraphic Column
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions
Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM



Bounding Graben Faults

Salt Dome Basins — SDB

Middle Cret. Louann Detachment — MKD

Wilcox Top Cret. Detachment — TKD

Wilcox Detachment — WD

Upper Eocene Detachment — UED

Mixed Upper Eocene and Top Salt Detachment — MD

Vicksburg Detachment — VD

Oligocene - Miocene Detachment — OMD

Shelf Minibasins — SM

Slope Minibasins — SPM

Roho — R

Salt Canopy — SC

Oligocene-Lower Miocene Compression — OMC

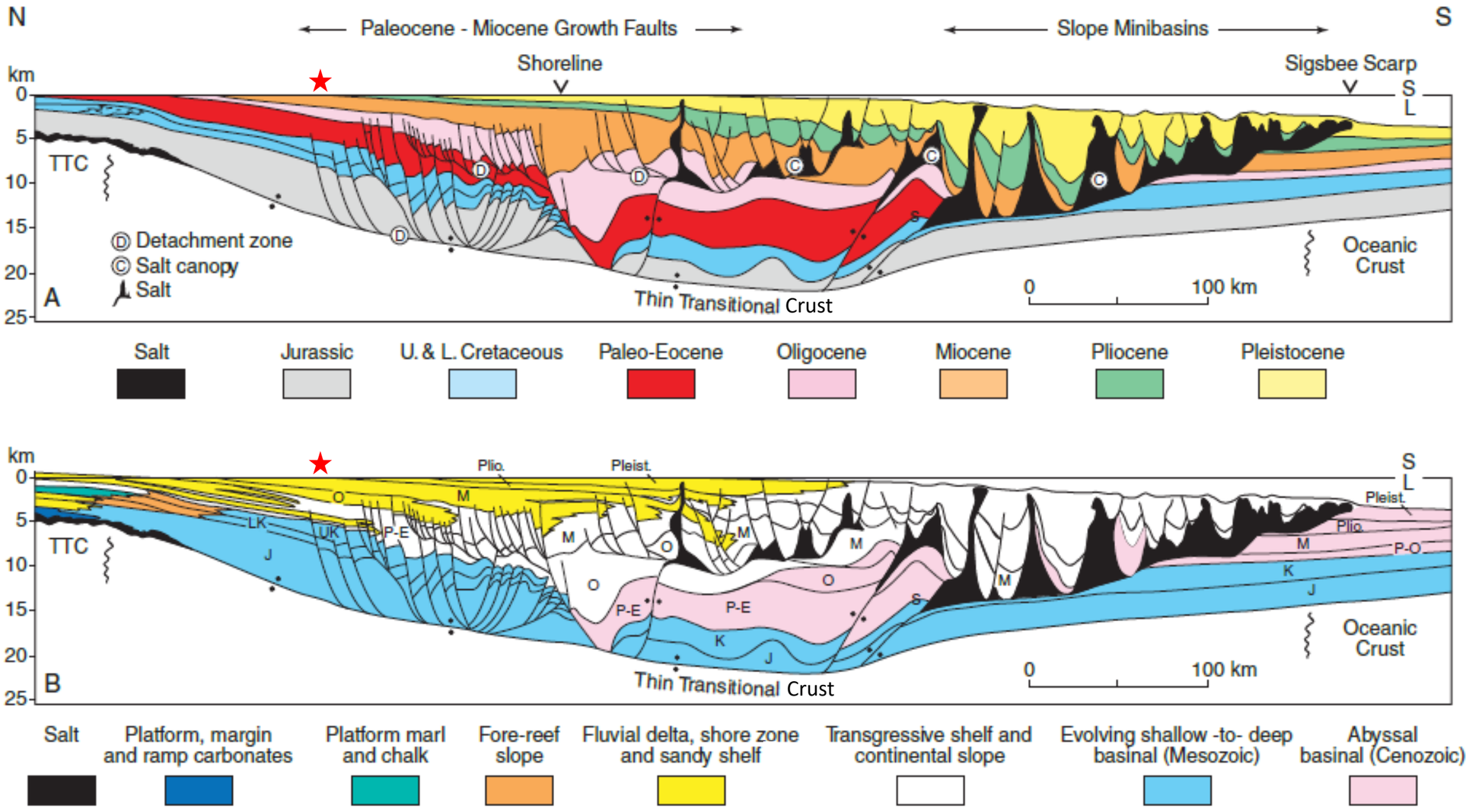
Miocene Compression — MC

★ Approximate location of the Rose Project Area

Source: Galloway, W. E. (2008). Sedimentary Basins of the World, Chapter 15: Depositional Evolution of the Gulf of Mexico Sedimentary Basin. 505-549.

Figure B-3
Structural Domains - Northern Gulf Schematic
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

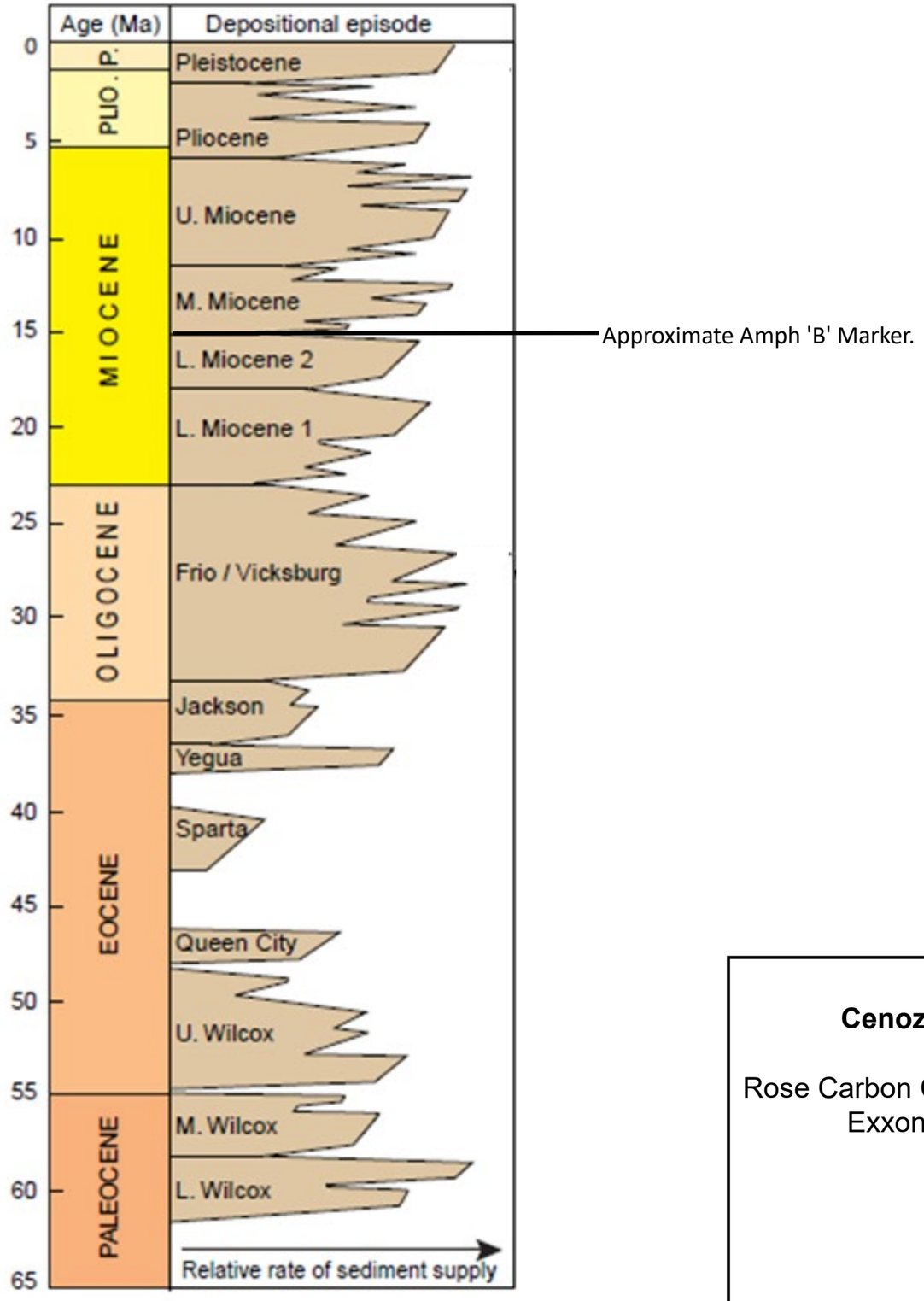
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Source: Galloway, W. E. (2008). Sedimentary Basins of the World, Chapter 15: Depositional Evolution of the Gulf of Mexico Sedimentary Basin. 505-549.

Figure B-4
Regional Cross Section
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions
Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

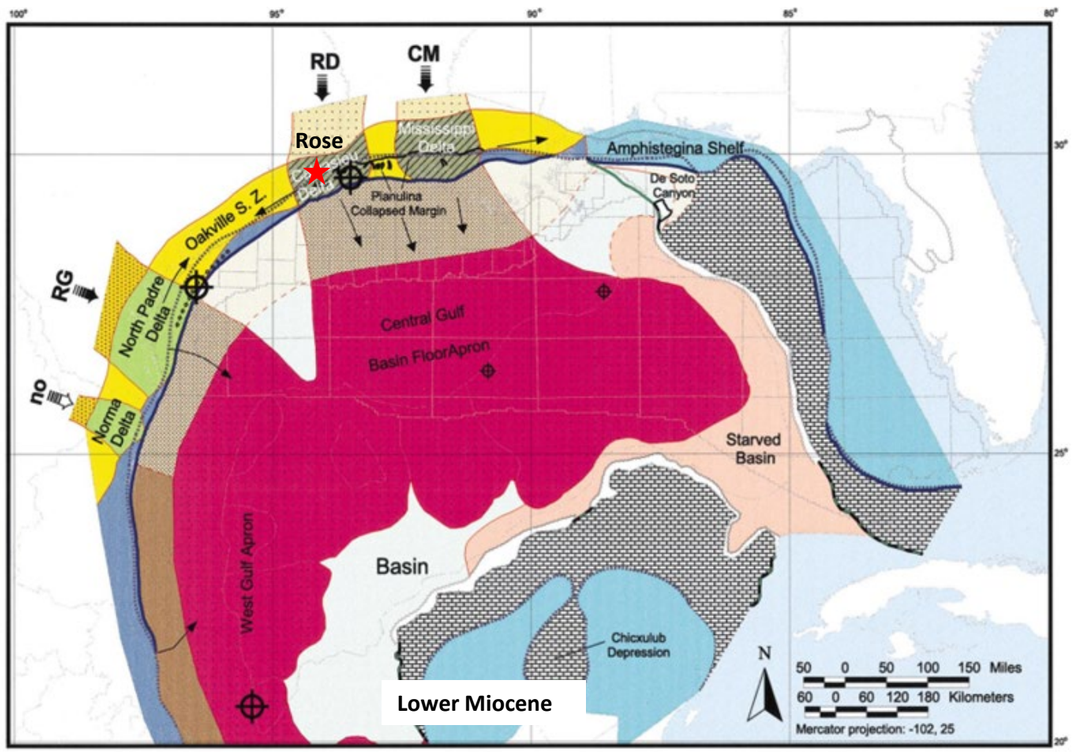


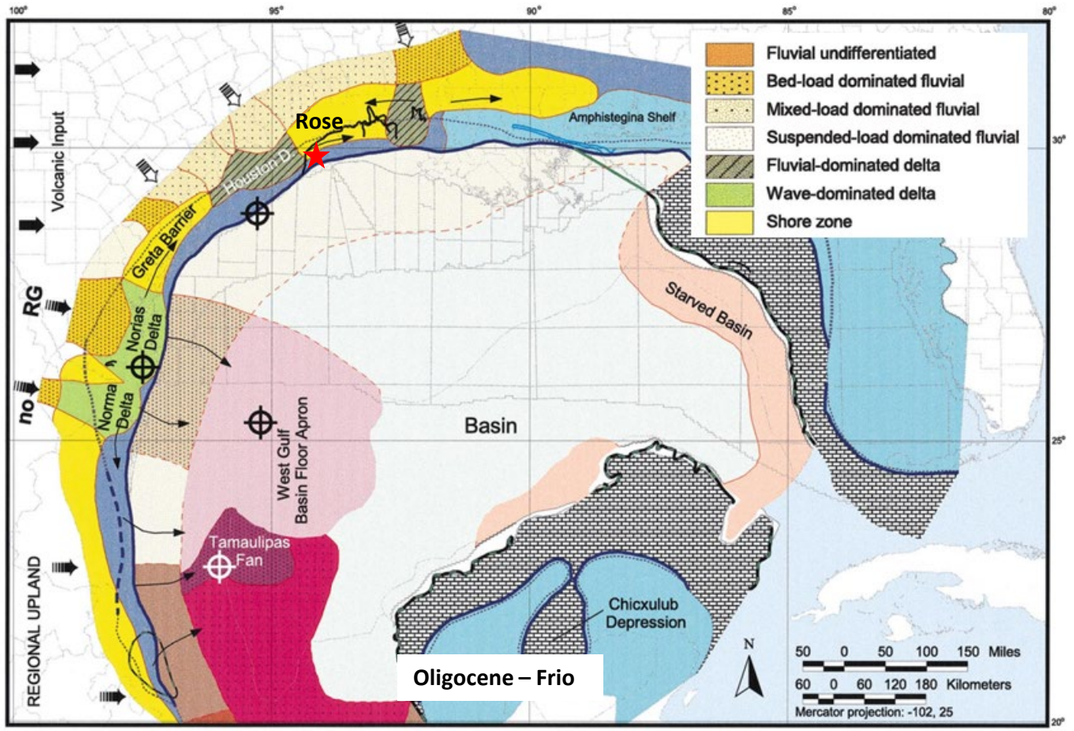
Note: Miocene-age sediments are equivalent to Fleming Formation.

Source: Treviño, R. H., & Rhatigan, J.-L. T. (2017). Regional Geology of the Gulf of Mexico and the Miocene Section of the Texas Near-Offshore Waters. *Bureau of Economic Geology*.

Figure B-5
Cenozoic Depositional Episodes Schematic
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM



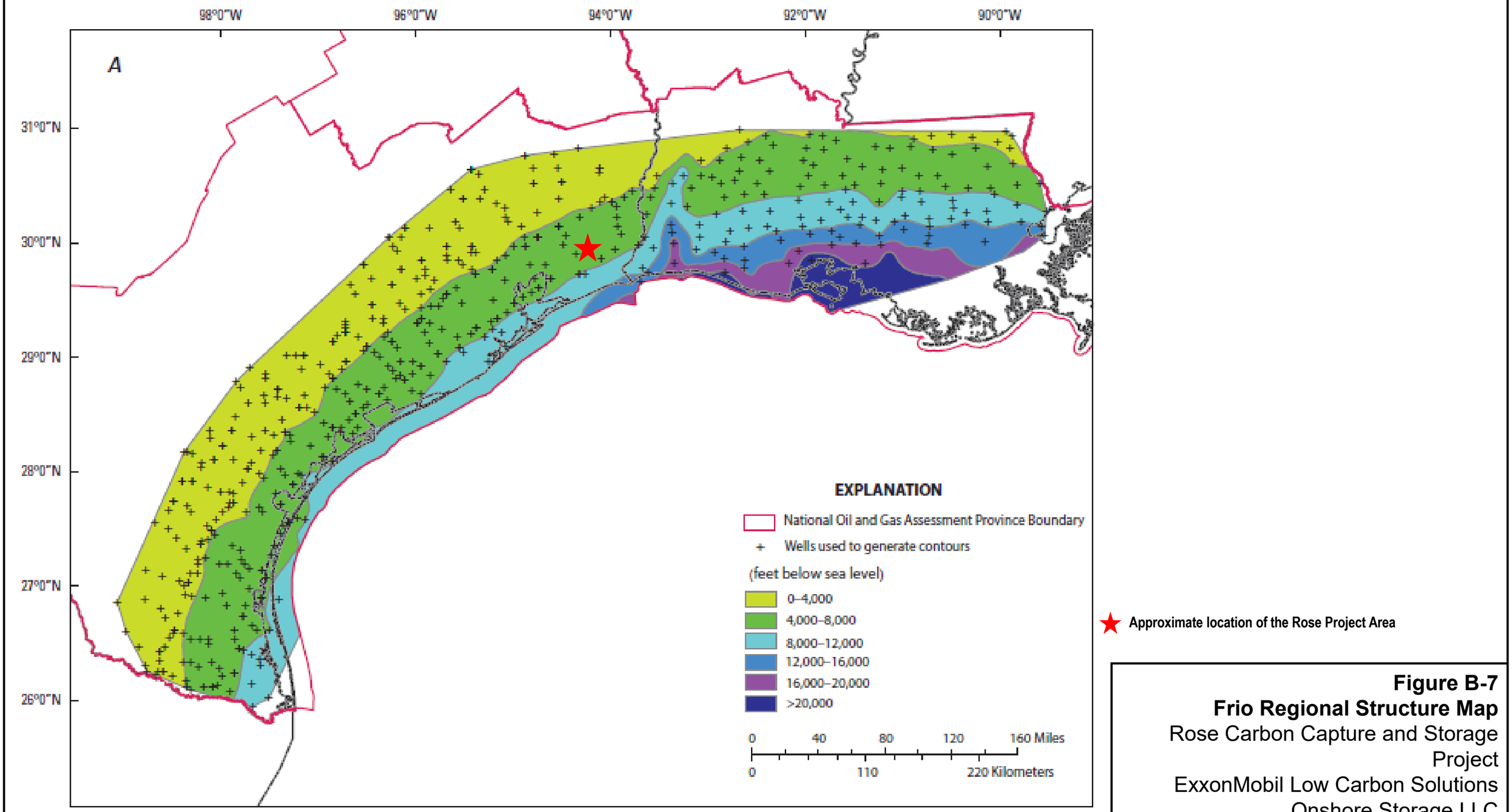


★ Approximate location of the Rose Project Area

Source: Galloway, W. E., P. E. Ganey-Curry, X. Li, R. T. Buffler, 2000, Ceneozoic depositional history of the Gulf of Mexico basin, AAPG Bulletin, V. 84, No. 11 p. 1743-1774.

Figure B-6
Environments of Deposition Schematic
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

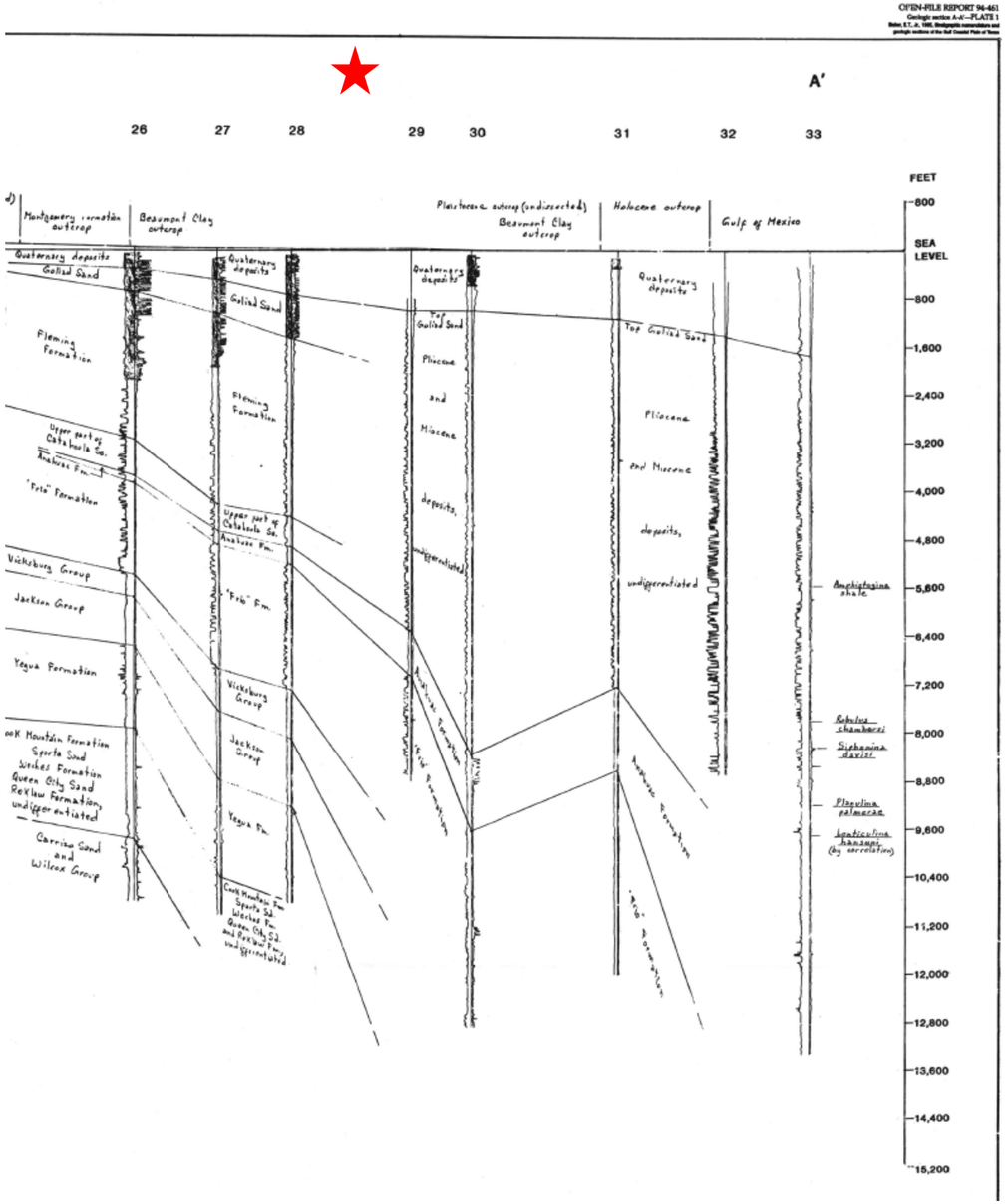
Environmental Resources Management ERM

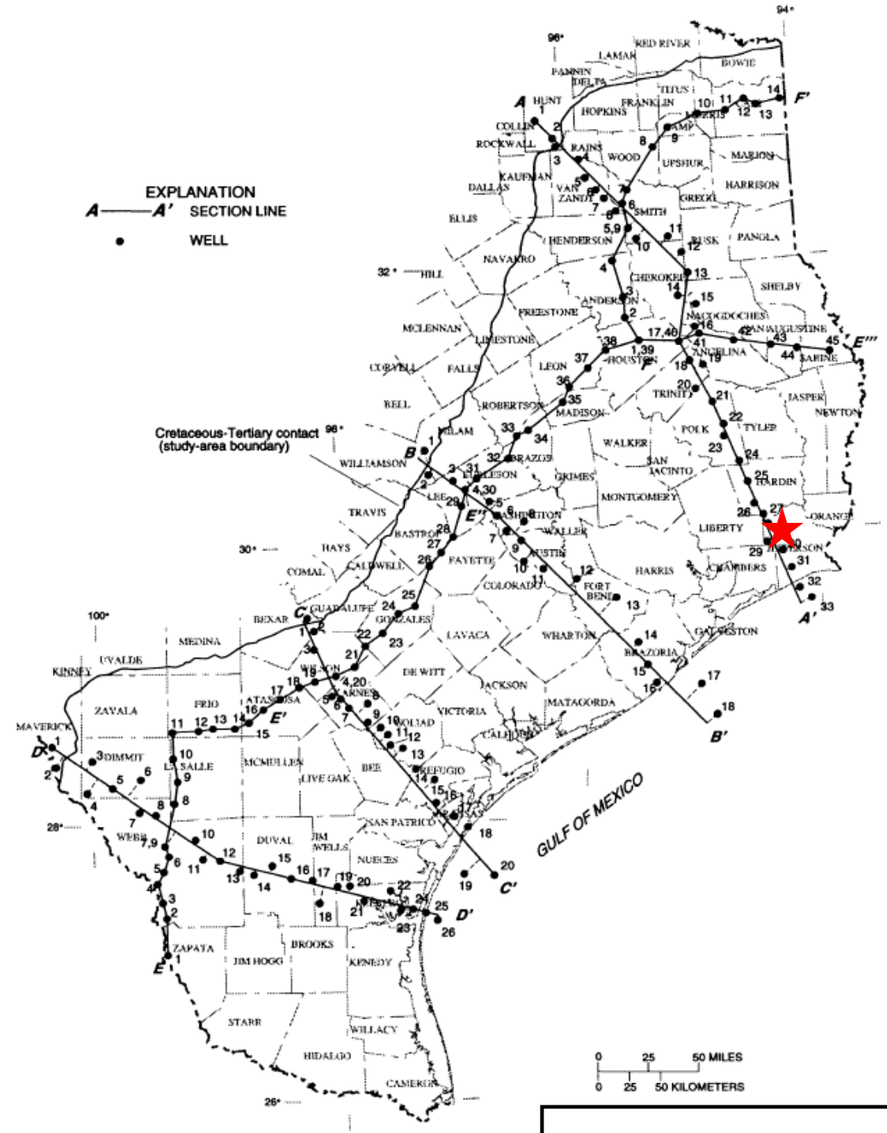


Source: Swanson, S. M., A. W. Karlsen, B. J. Valentine, 2013, Geologic Assessment of Undiscovered Oil and Gas Resources-Oligocene Frio and Anahuac Formations, United States Gulf of Mexico Coastal Plain and State Waters, Open-File Report 2013-1257, U.S. Geological Survey, Reston.

Figure B-7
Frio Regional Structure Map
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM





★ **Approximate location of the Rose Project Area**

Source: Baker Jr., E. T., 1995, Stratigraphic nomenclature and geologic sections of the Gulf Coastal Plain of Texas, Open-File Report 94-461,USGS, https://doi.org/10.3133/ofr94461

Figure B-8
Regional Dip-Oriented Cross Section
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

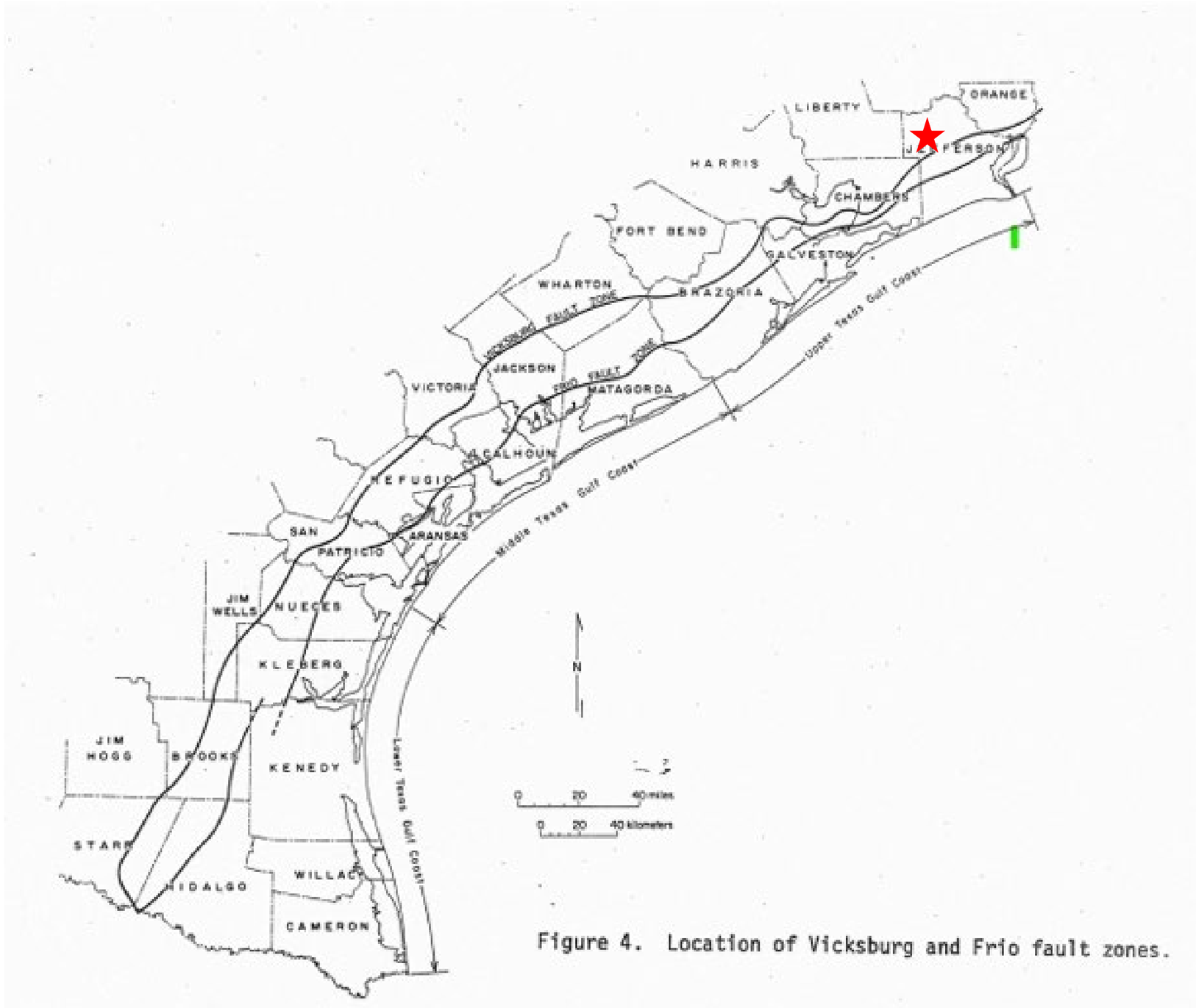


Figure 4. Location of Vicksburg and Frio fault zones.

★ Approximate location of the Rose Project Area

Figure B-9
Vicksburg/Frio Fault Zone Map
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

Source: Loucks. R. G., S. C. Claypool, P. E. Luttrell, V. J. Gavenda, K. L. Milliken, J. H. Han, M. G. Moseley, 1978, Geothermal Resources, Vicksburg Formation, Texas Gulf Coast, Bureau of Economic Geology, University of Texas at Austin, Austin.

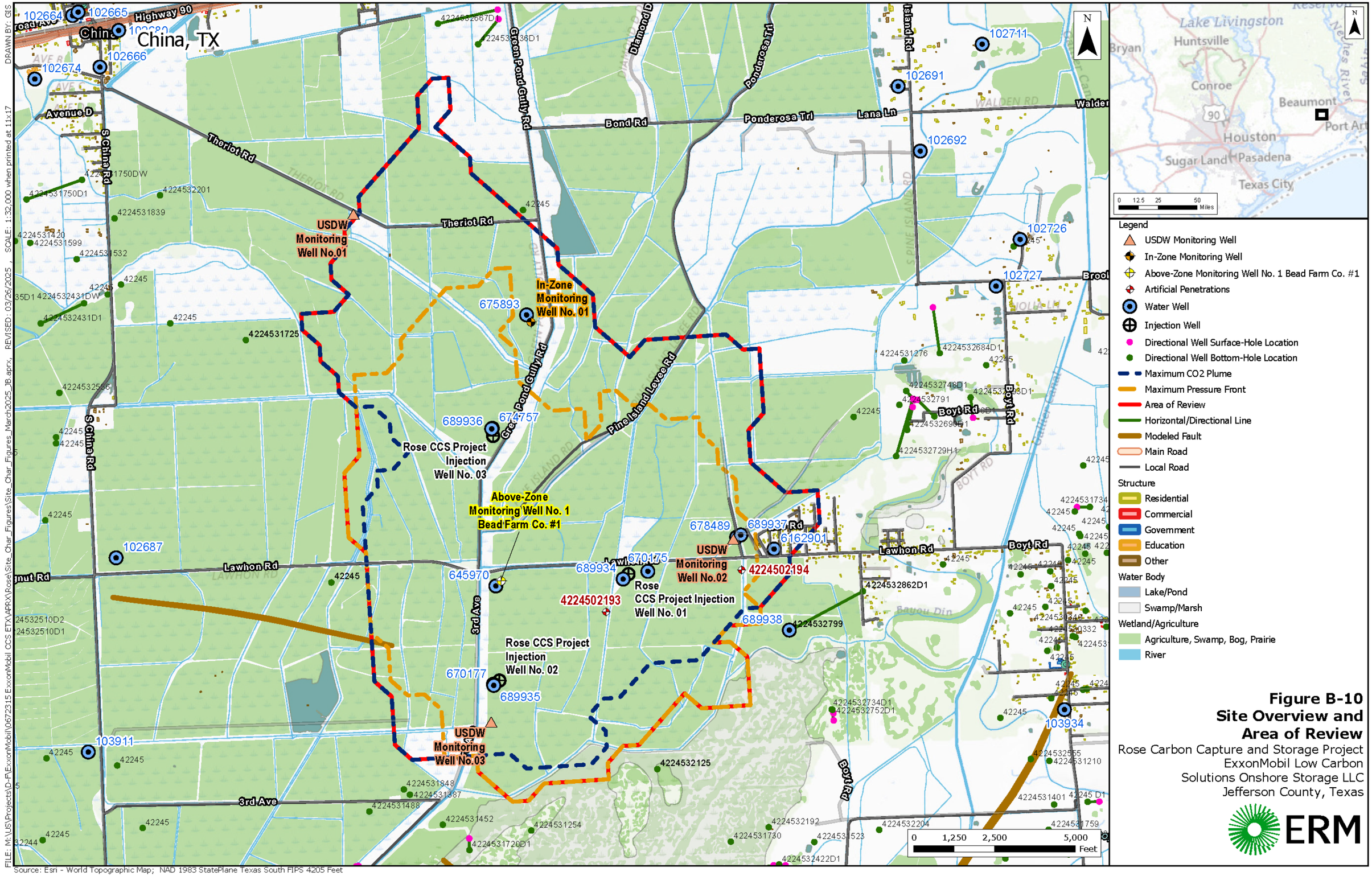


Figure B-10
Site Overview and Area of Review
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

Source: Esri - World Topographic Map; NAD 1983 StatePlane Texas South FIPS 4205 Feet

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Rose CCS Project Injection Well No. 03

Rose CCS Project Injection Well No. 01

Rose CCS Project Injection Well No. 02

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422453042600

422450011000

422450059800

422453021200

422450218800

422450219200

422453145200

422450223700

422453140500

422453134500

Lake Livingston

Huntsville

Bryan

Conroe

Beaumont

Port Arthur

Houston

Sugar Land

Pasadena

Texas City

0 12.5 25 50 Miles

Legend

- USDW Monitoring Well
- In-Zone Monitoring Well
- Above-Zone Monitoring Well No. 1 Bead Farm Co. #1
- Artificial Penetrations
- Injection Well
- TWDB Wells in AoR
- Cross Section Point
- Local Seismic Line Parallel to Dip
- Local Seismic Line Perpendicular to Dip

Cross Section Line

- NW to SE
- SW to NE
- Maxiumum Pressure Front
- Stabilized CO2 Plume
- Area of Review
- SW Beaumont License Area
- 2D Seismic Line
- 3D Seismic Survey Extent

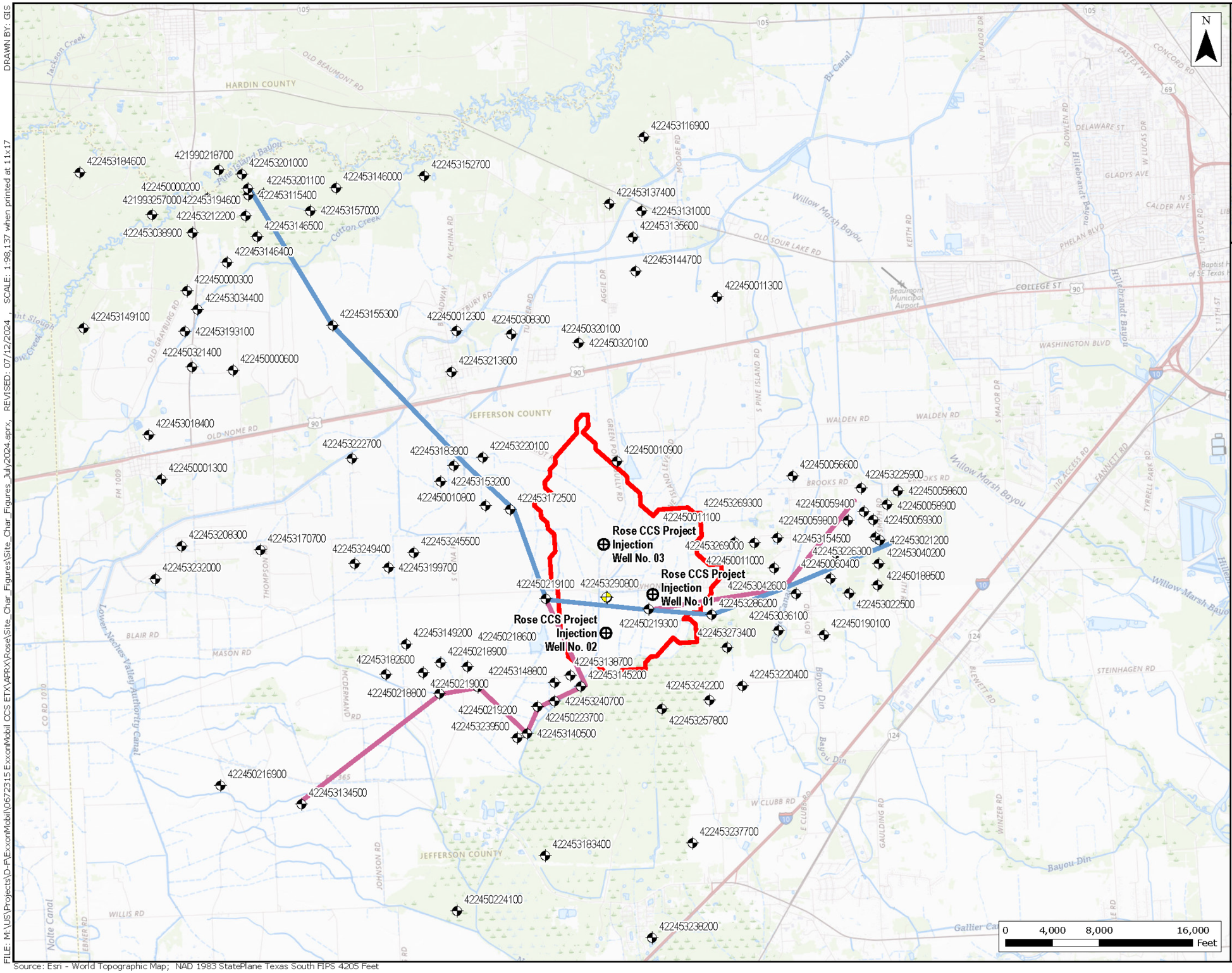
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Source: Esri - World Topographic Map; NAD 1983 StatePlane Texas South FIPS 4205 Feet

Figure B-11a
Well Basemap with Cross Section Lines and Geologic Data Sources
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

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JEFFERSON COUNTY
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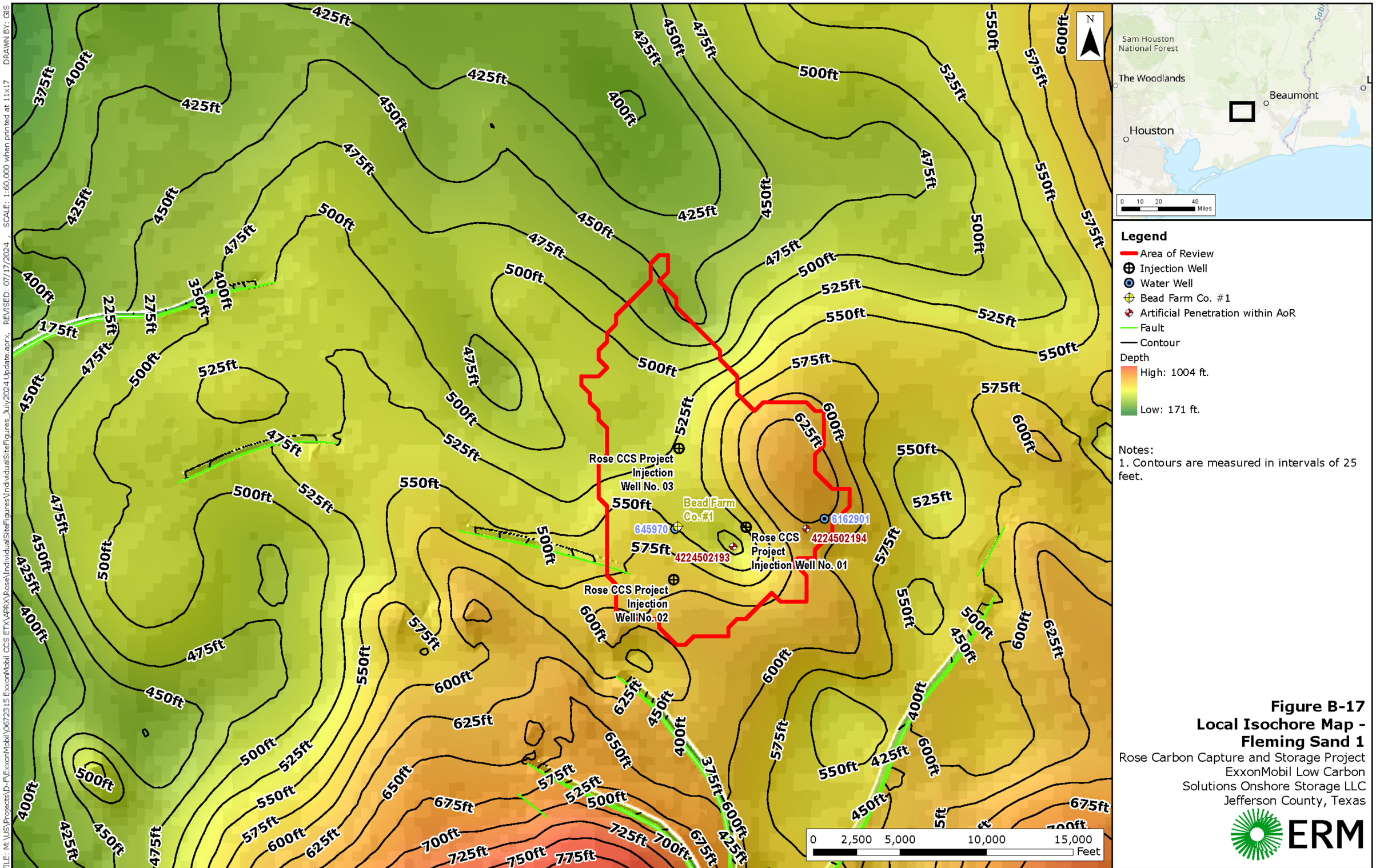
Claimed as PBI

Claimed as PBI

Claimed as PBI

Claimed as PBI

Claimed as PBI



Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 1004 ft.

Low: 171 ft.

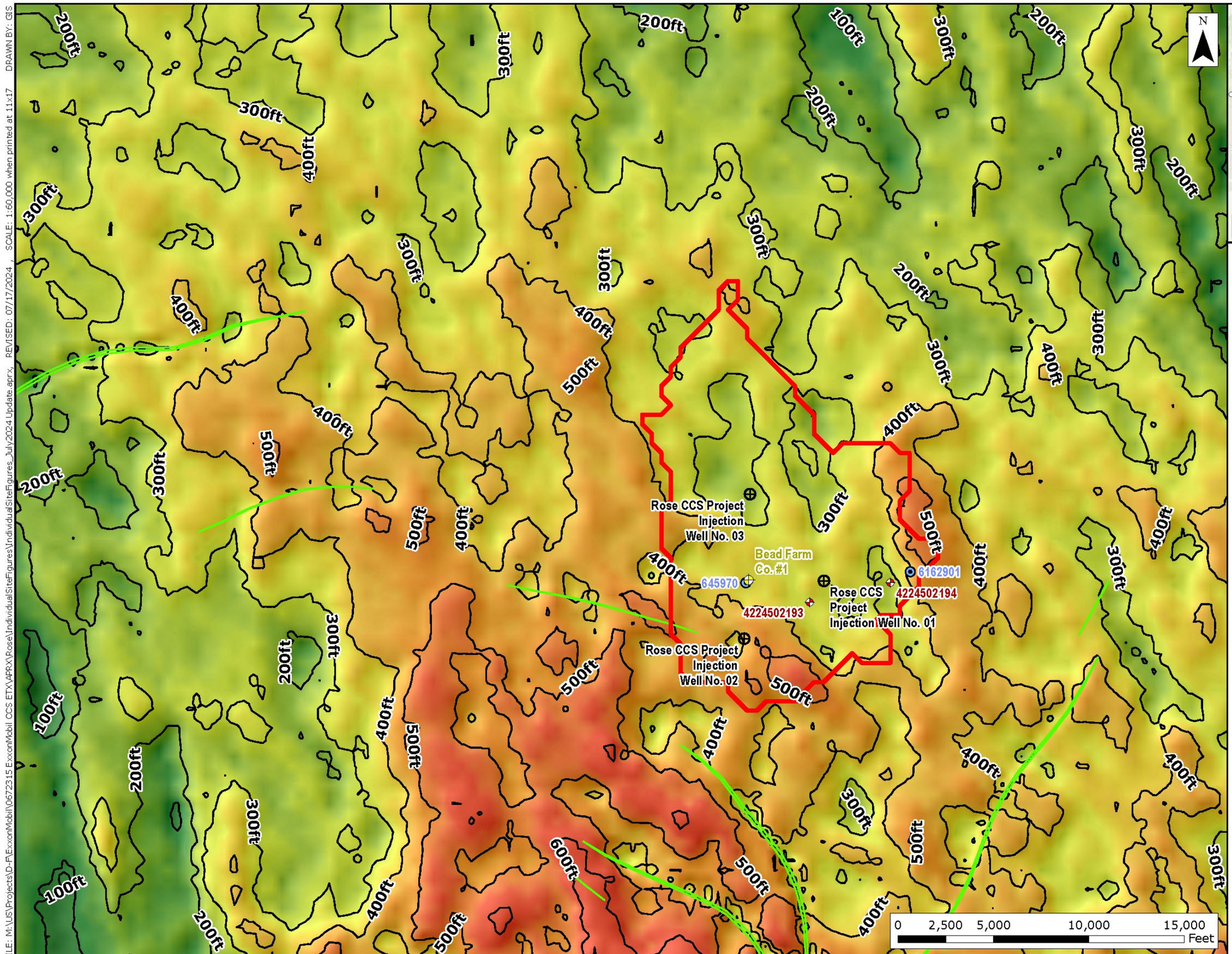
Notes:
1. Contours are measured in intervals of 25 feet.

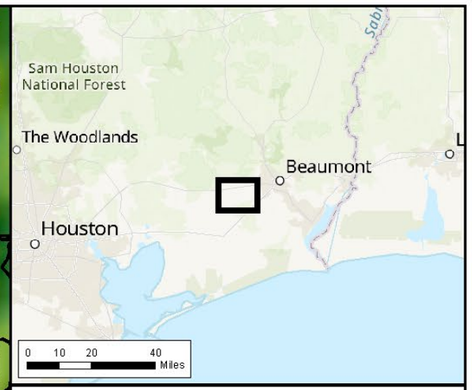
Figure B-17
Local Isochore Map - Fleming Sand 1
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS

FILE: M:\US\Projects\D-F\ExxonMobil\0672315 ExxonMobil CCS ETX\APRX\Rose\IndividualSiteFigures\IndividualSiteFigures_July2024 Update.aprx, REVISED: 07/17/2024 , SCALE: 1:60,000 when printed at 11x17 DRAWN BY: GIS





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 844 ft

Low: 26 ft

Notes:
1. Contours are measured in intervals of 100 feet.

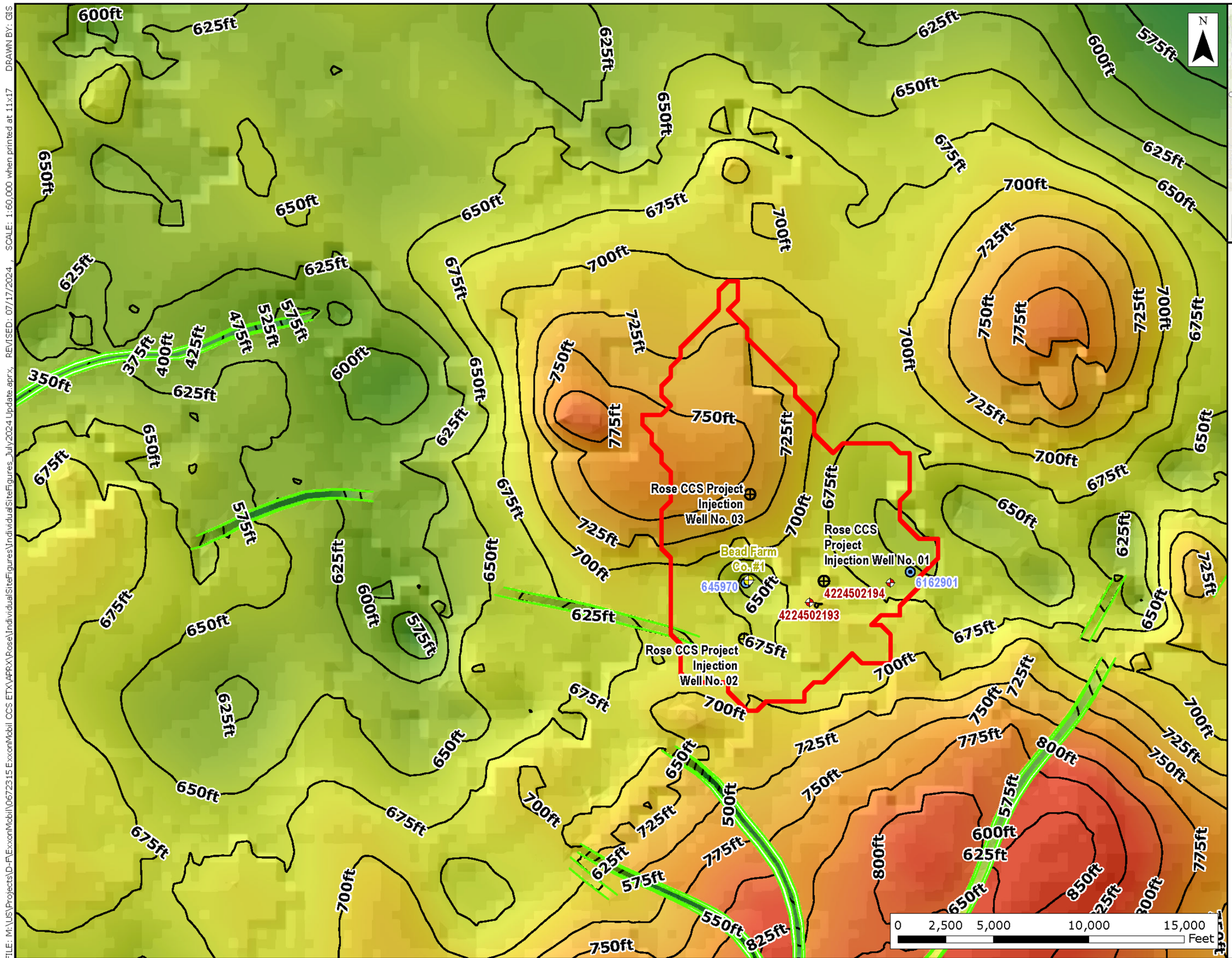
Figure B-18
Net Sand Thickness Map - Fleming Sand 1
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

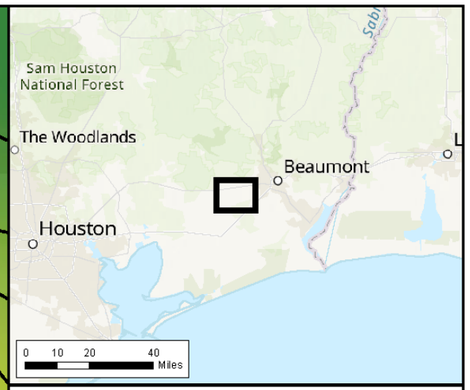
ERM

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Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

Depth: 885 ft.

Low: 194 ft.

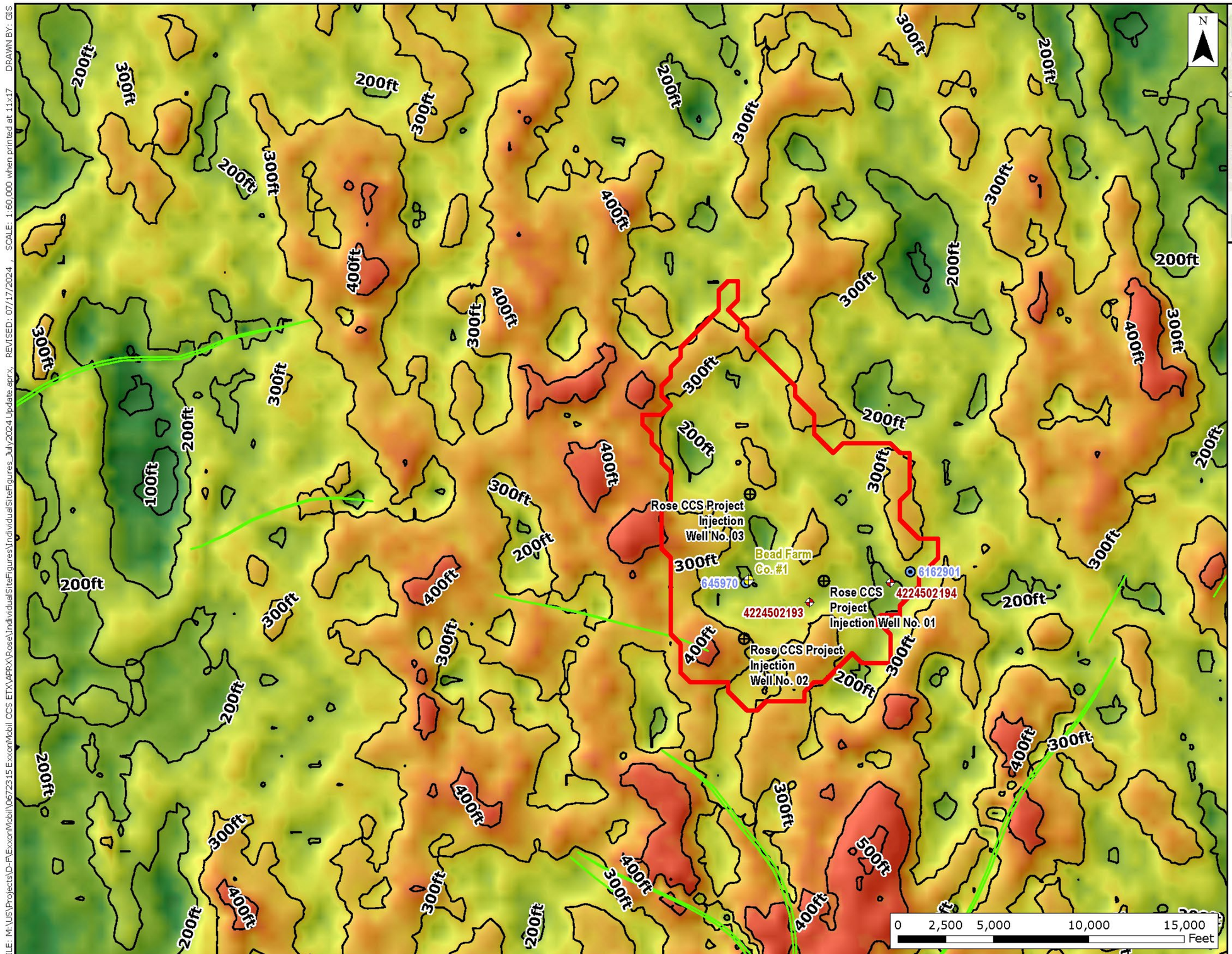
Notes:
1. Contours are measured in intervals of 25 feet.

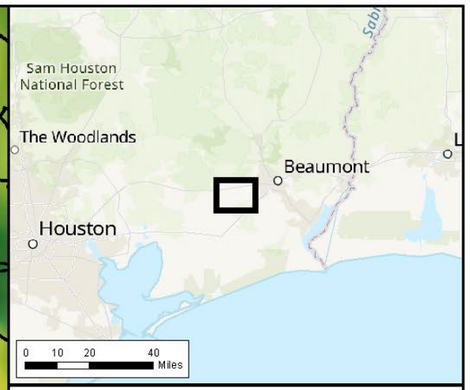
Figure B-19
Local Isochore Map - Fleming Sand 2
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

FILE: M:\US\Projects\D-FE\ExxonMobil\0672315 ExxonMobil CCS ETX\APRX\Rose\IndividualSiteFigures\IndividualSiteFigures_July2024 Update.aprx, REVISED: 07/17/2024 SCALE: 1:60,000 when printed at 11x17 DRAWN BY: GIS

Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 524 ft.

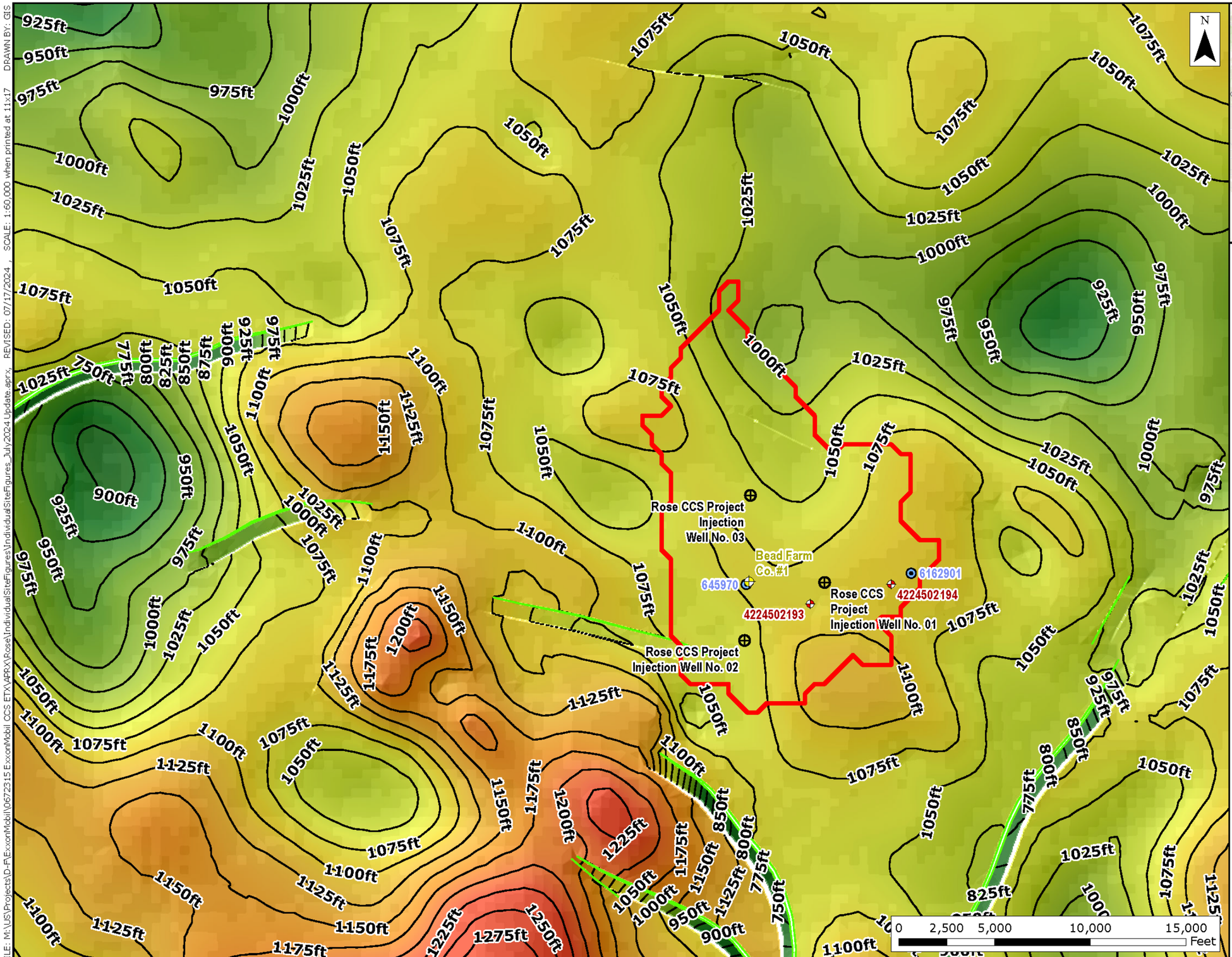
Low: 21 ft.

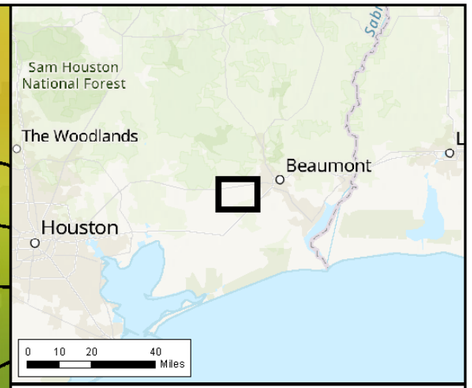
Notes:
1. Contours are measured in intervals of 100 feet.

Figure B-20
Net Sand Thickness Map - Fleming Sand 2
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

FILE: M:\US\Projects\D-F\ExxonMobil\0672315 ExxonMobil CCS ETX\APRX\Rose\IndividualSiteFigures\IndividualSiteFigures_July2024 Update.aprx, REVISED: 07/17/2024 , SCALE: 1:60,000 when printed at 11x17 DRAWN BY: GIS
Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 1516 ft.

Low: 471 ft.

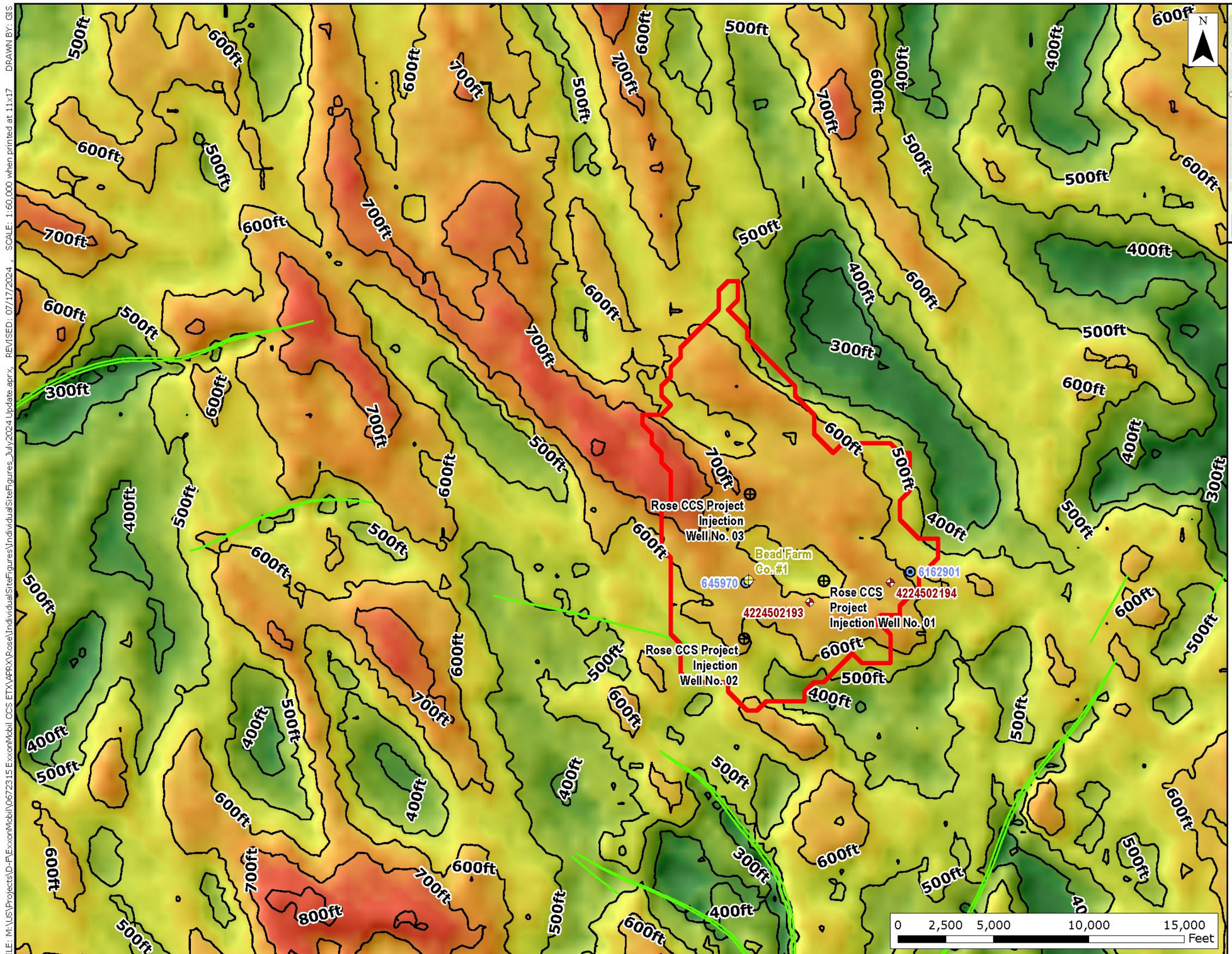
Notes:
1. Contours are measured in intervals of 25 feet.

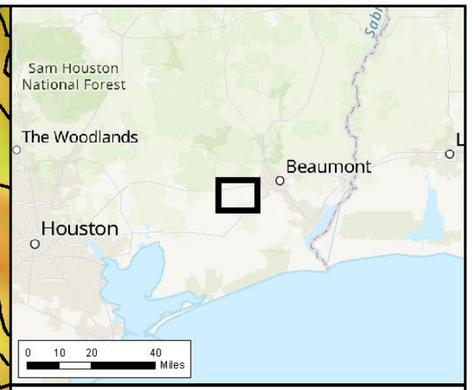
Figure B-21
Local Isochore Map - Fleming Sand 3
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

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Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS

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Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 1031 ft.

Low: 93 ft.

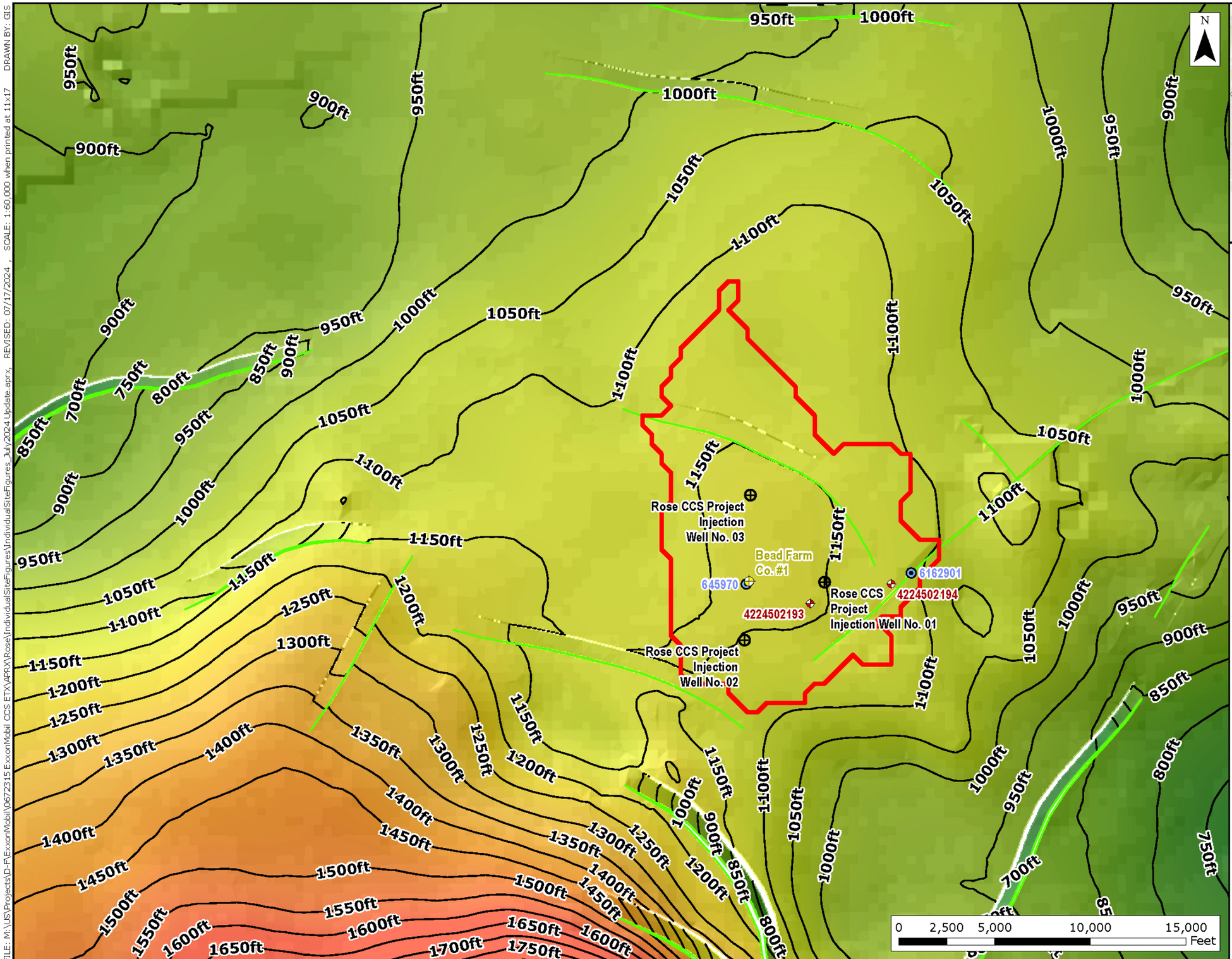
Notes:
1. Contours are measured in intervals of 100 feet.

Figure B-22
Net Sand Thickness Map - Fleming Sand 3
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

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Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS

Claimed as PBI



Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 2247 ft.

Low: 650 ft.

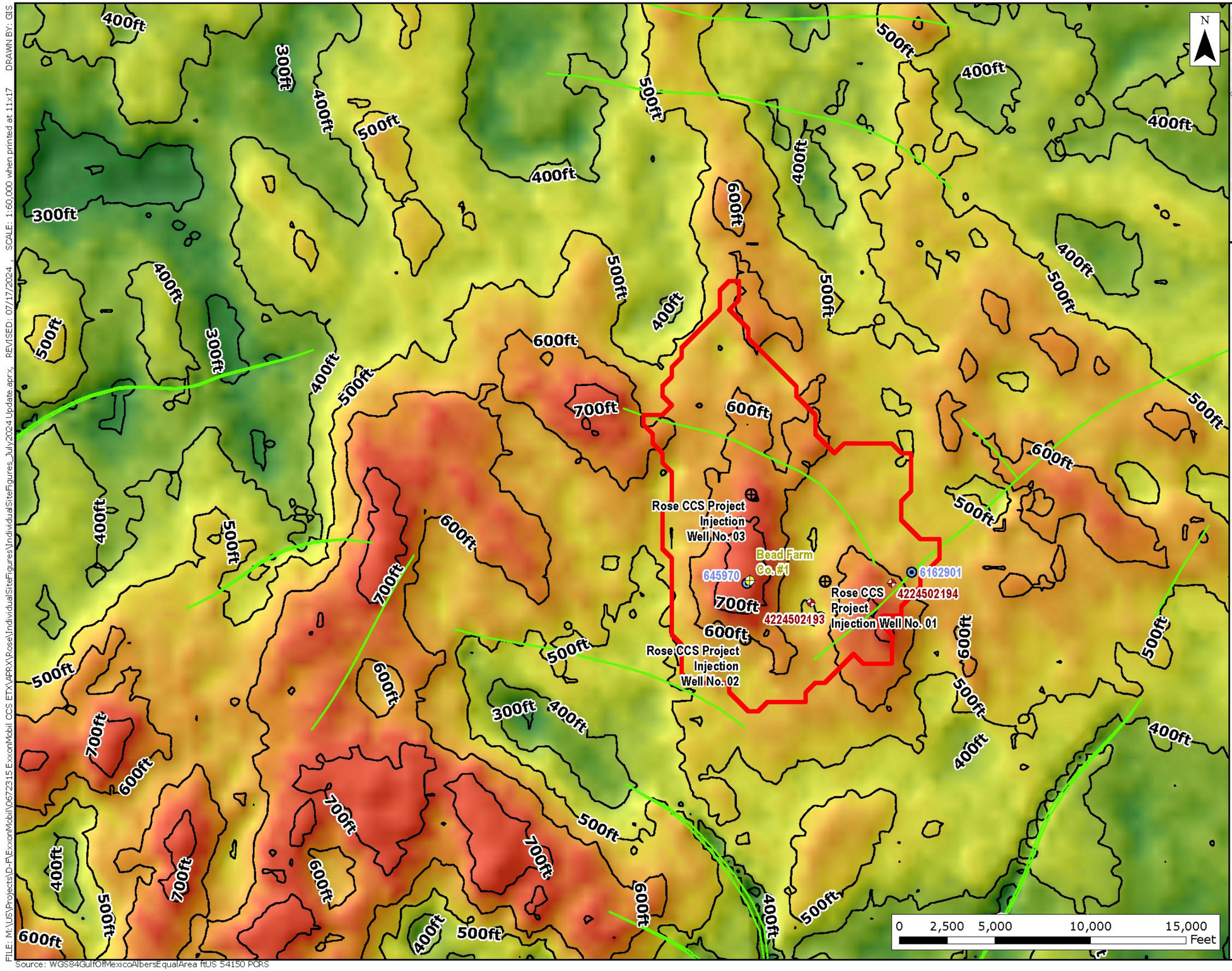
Notes:
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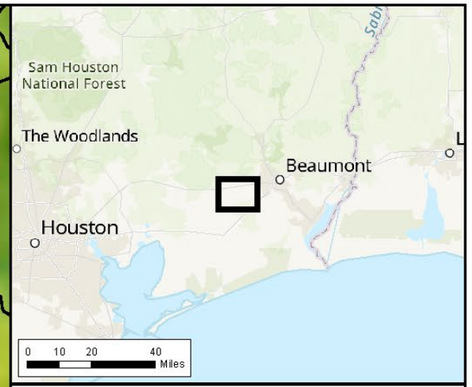
Figure B-24
Local Isochore Map - Upper Frio Sand 1
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

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Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

- High: 797 ft.
- Low: 200 ft.

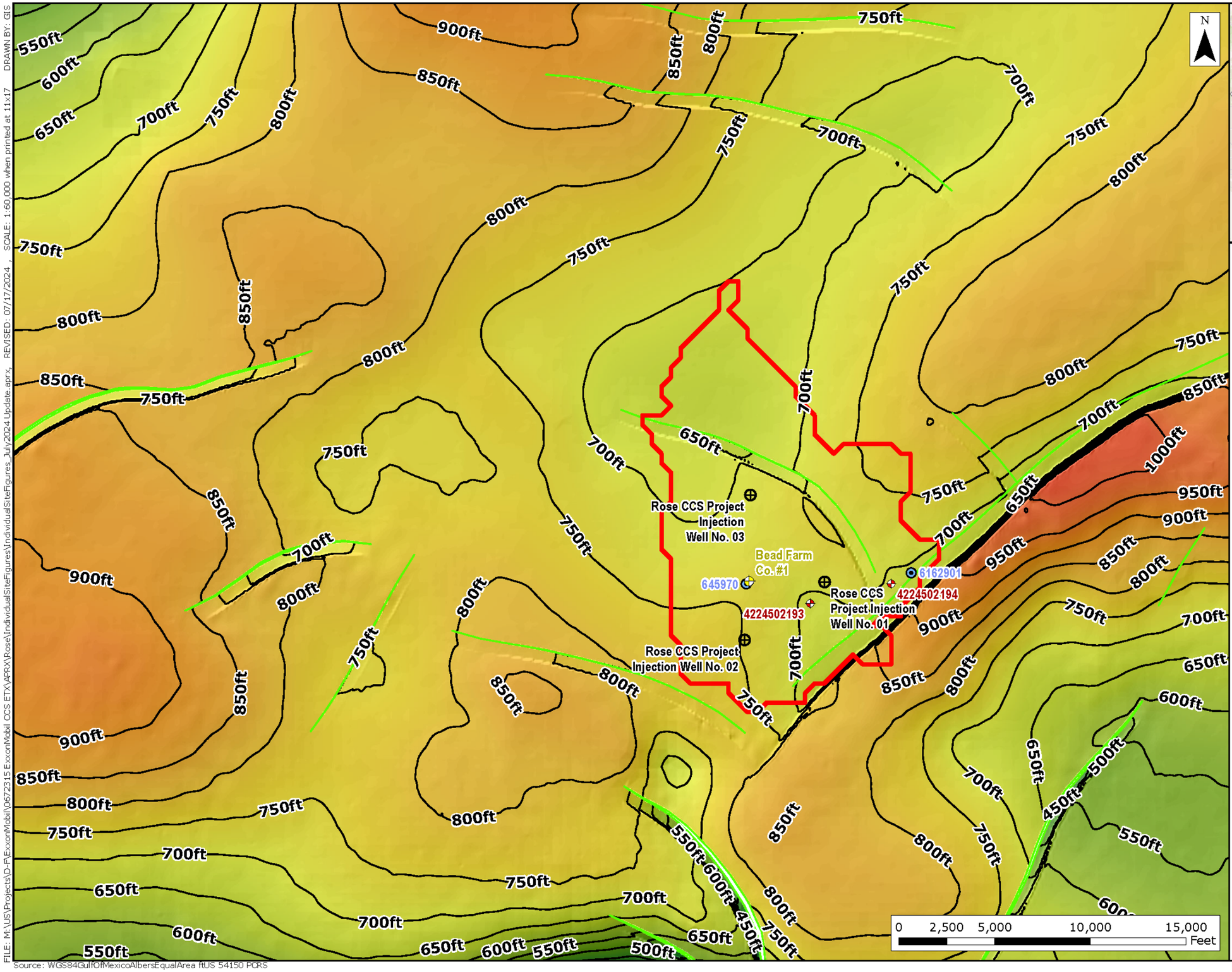
Notes:
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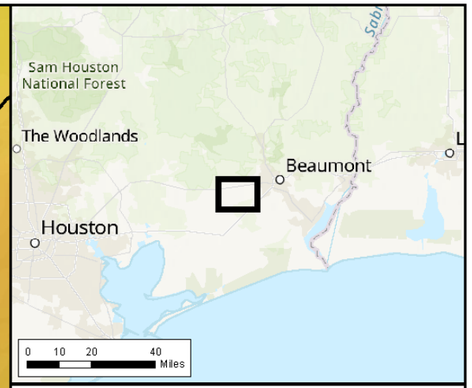
Figure B-25
Net Sand Thickness Map - Upper Frio Sand 1
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

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SCALE: 1:60,000 when printed at 11x17
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Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 1031 ft.

Low: -163 ft.

Notes:
1. Contours are measured in intervals of 50 feet.

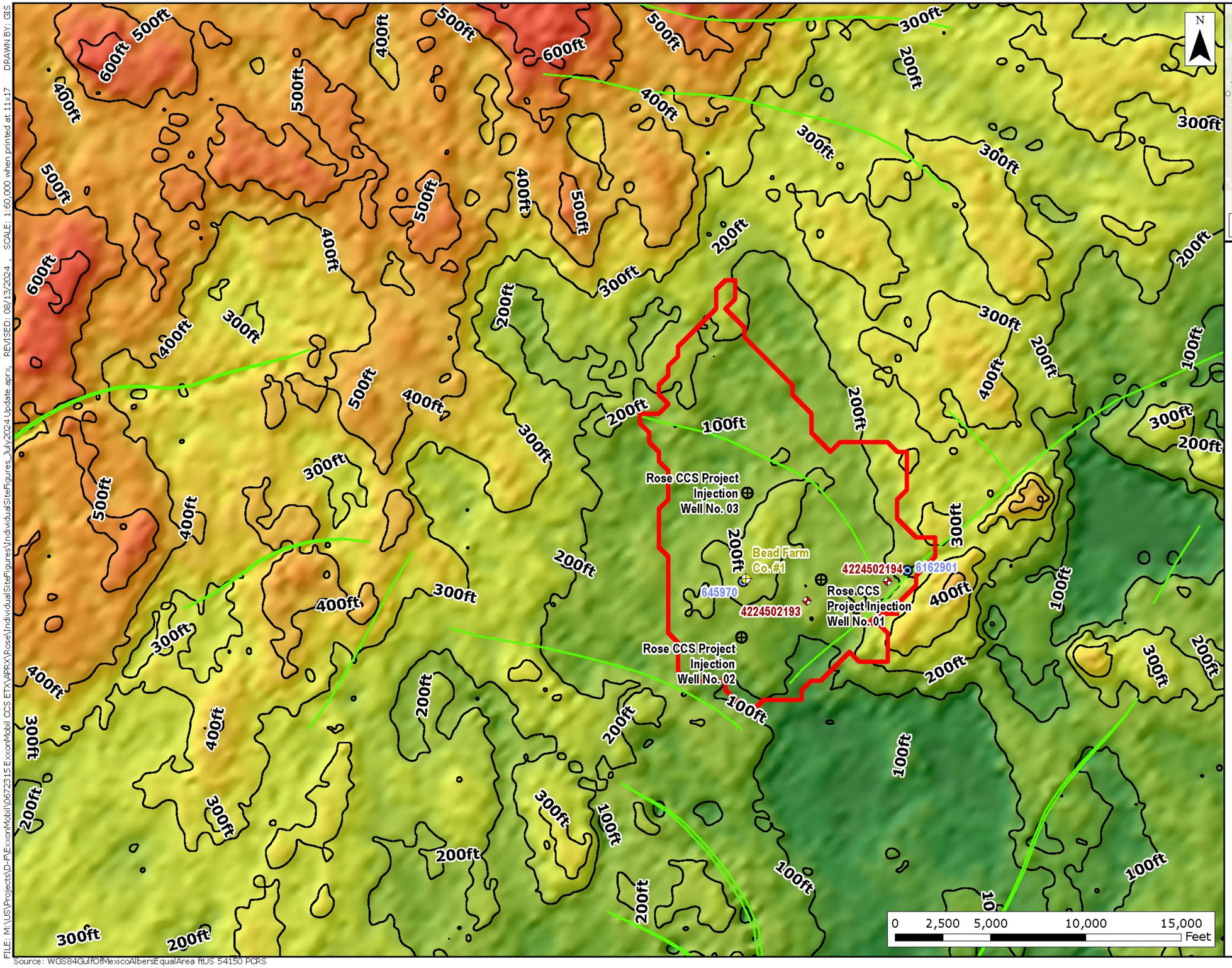
Figure B-26
Local Isochore Map - Upper Frio Sand 2
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

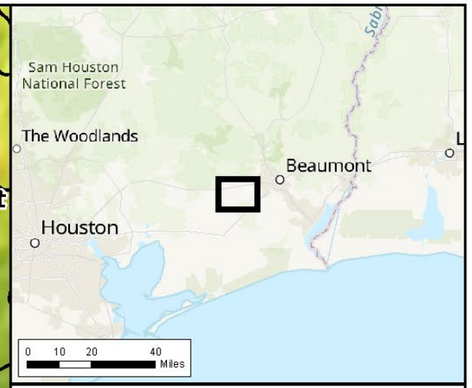
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Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 727 ft.

Low: 5 ft.

Notes:
1. Contours are measured in intervals of 100 feet.

Figure B-27
Net Sand Thickness Map - Upper Frio Sand 2
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

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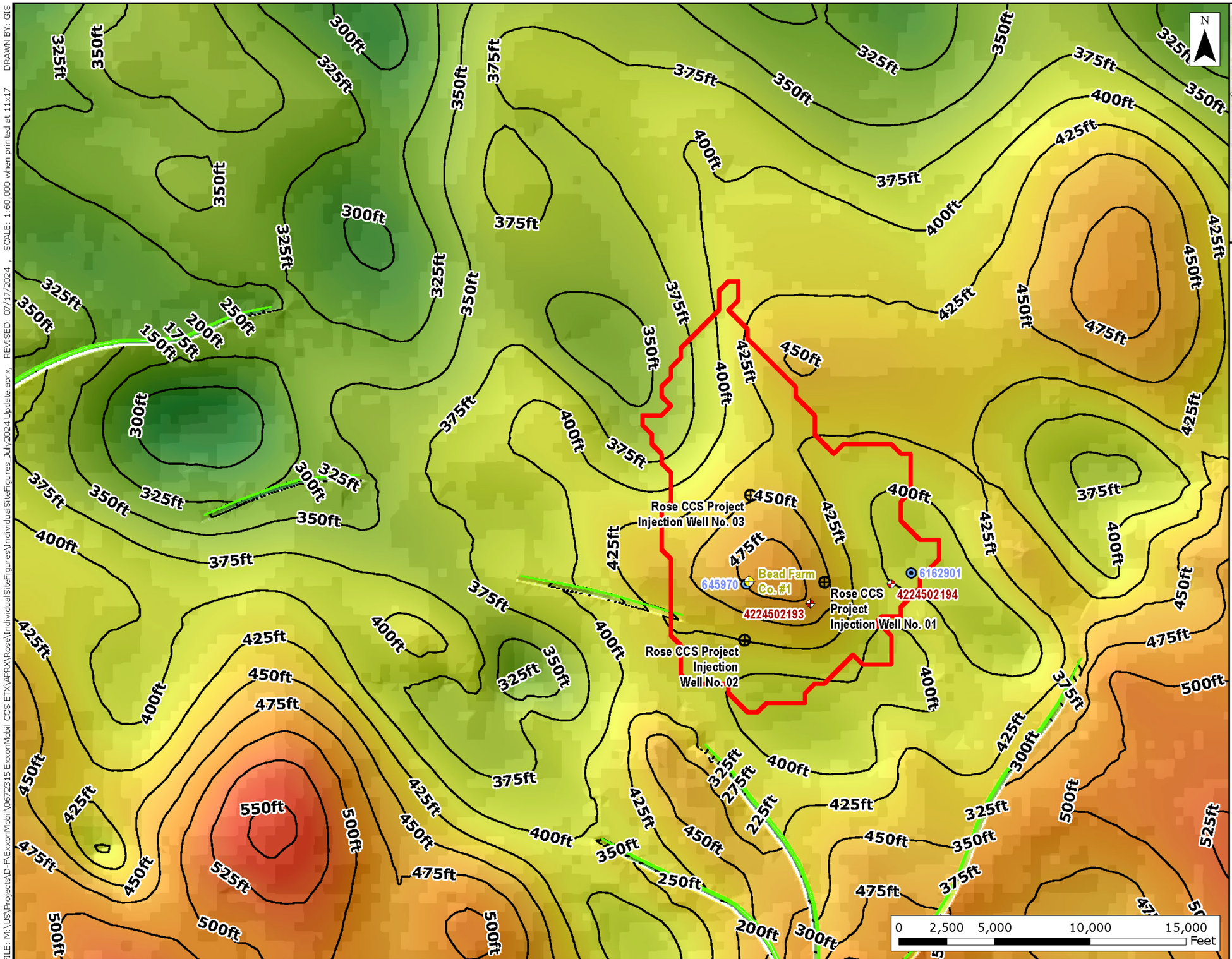
Claimed as PBI

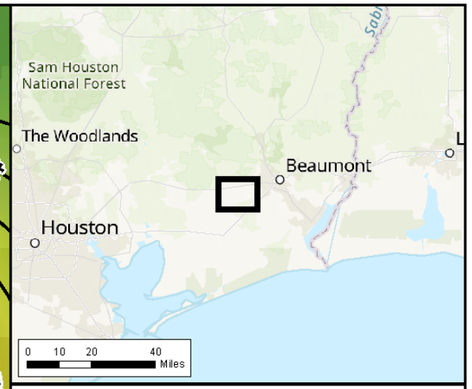
Claimed as PBI

Claimed as PBI

Claimed as PBI

Claimed as PBI





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 609 ft.

Low: 24 ft.

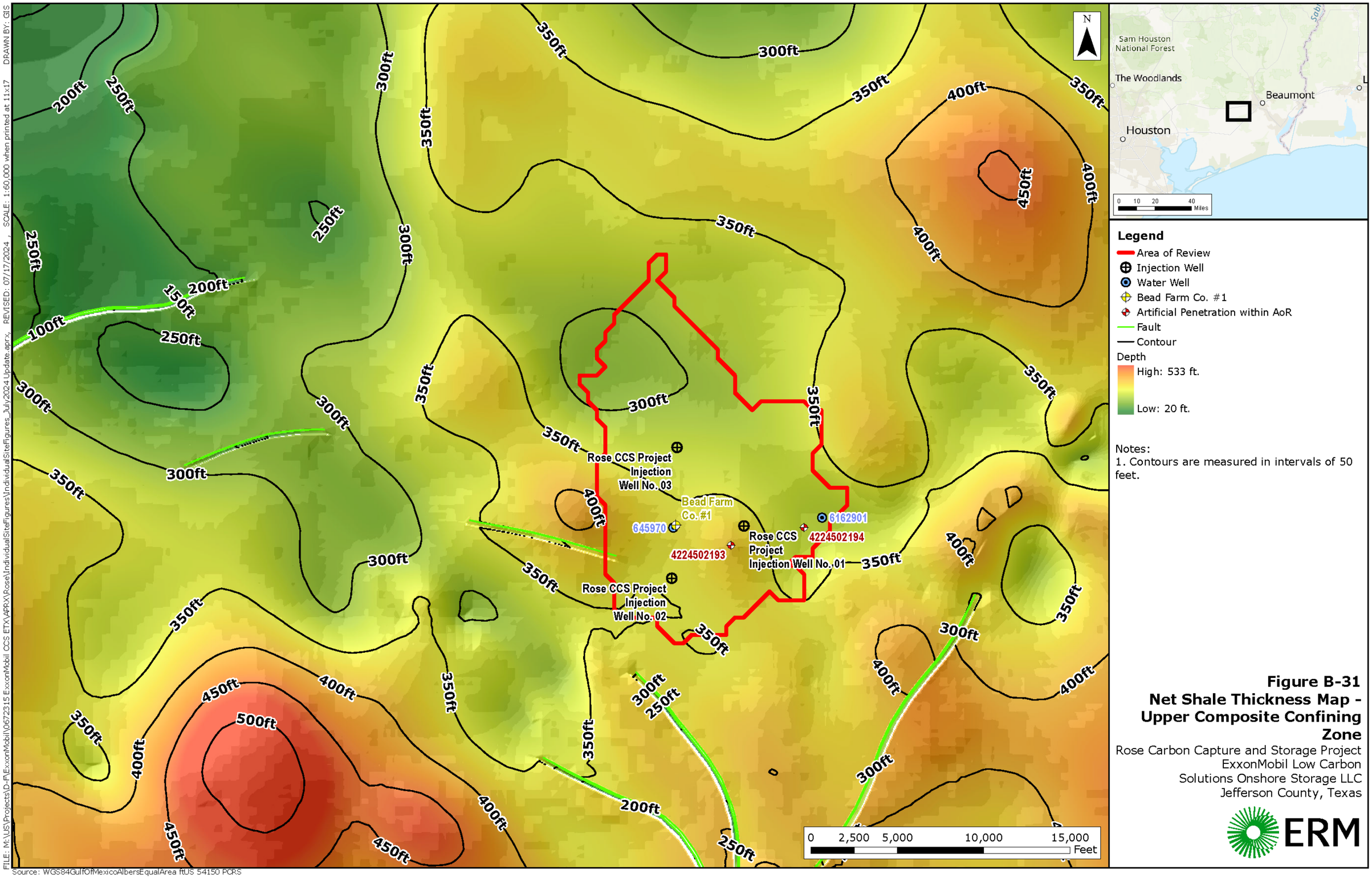
Notes:
1. Contours are measured in intervals of 25 feet.

Figure B-30
Local Isochore Map - Upper Composite Confining Zone
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon
Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

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Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 533 ft.

Low: 20 ft.

Notes:
1. Contours are measured in intervals of 50 feet.

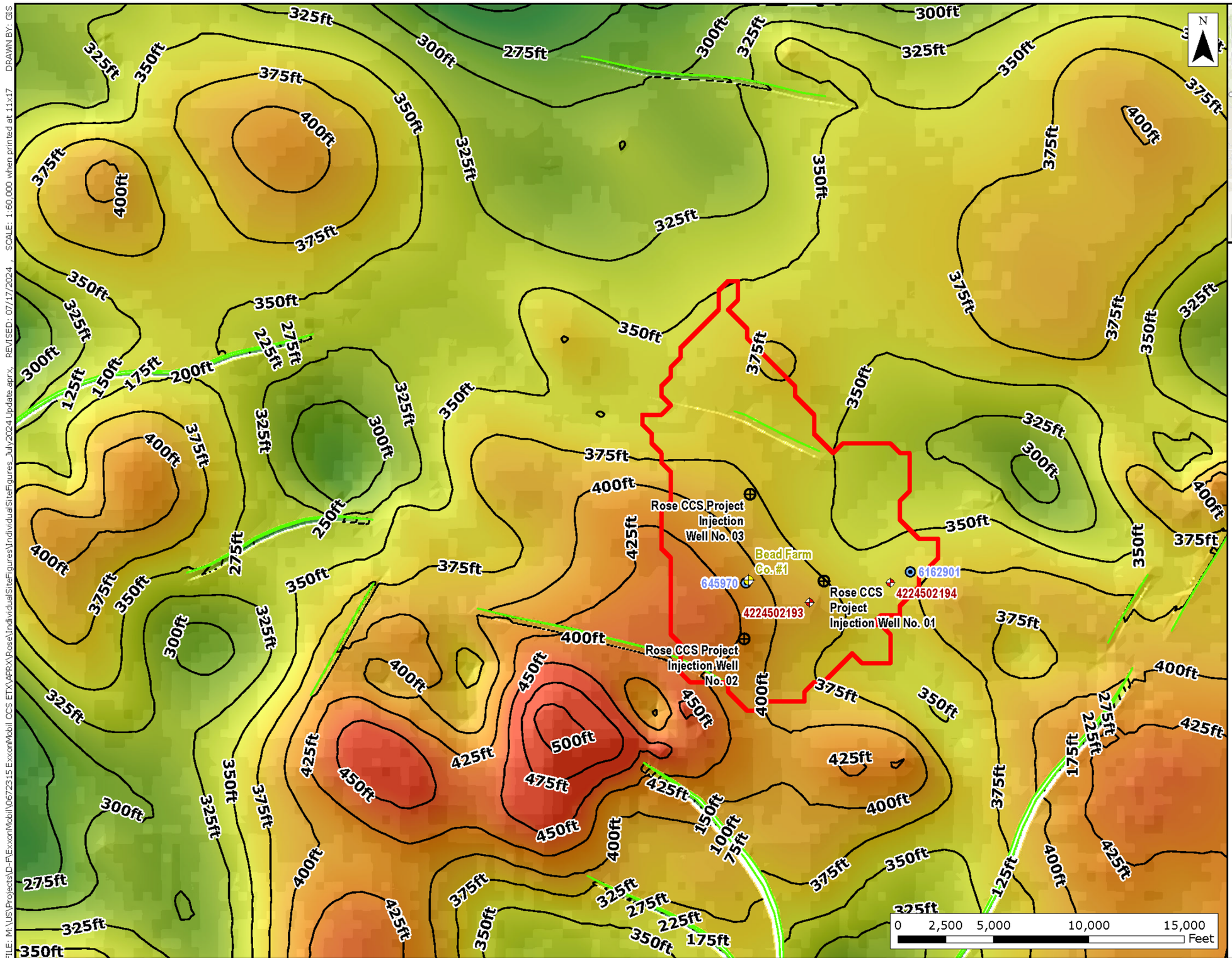
Figure B-31
Net Shale Thickness Map - Upper Composite Confining Zone
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

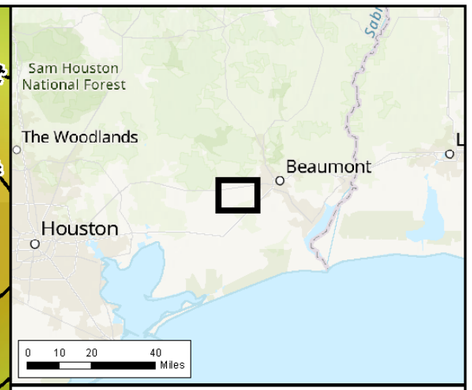
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Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS

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Claimed as PBI





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Top Anahuac Seal
- Contour

Depth

High: 511 ft.

Low: 5 ft.

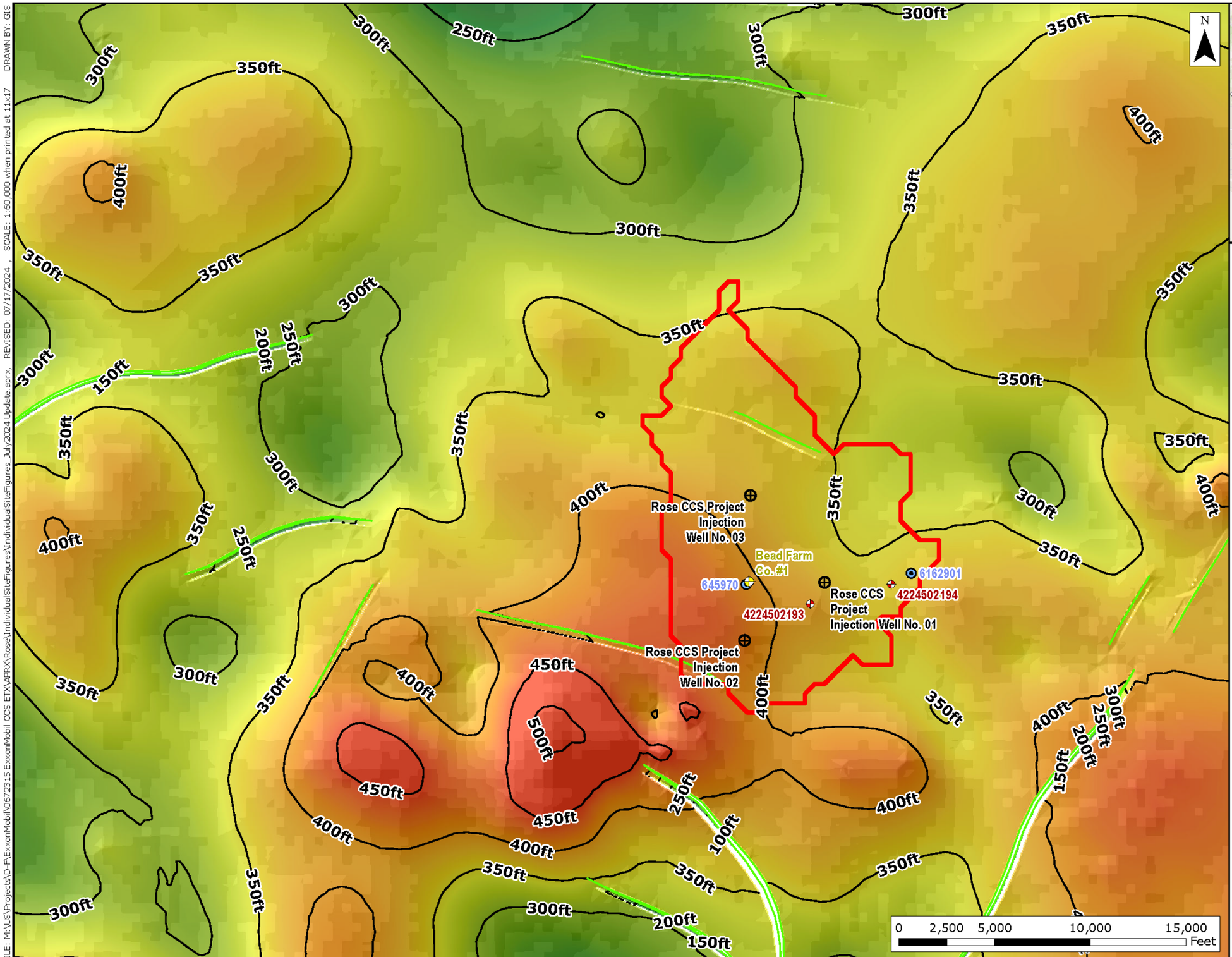
Notes:
1. Contours are measured in intervals of 25 feet.

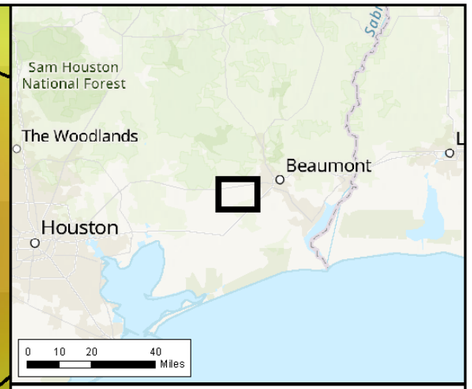
Figure B-33
Local Isochore Map - Anahuac Shale
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

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Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 511 ft.

Low: 5 ft.

Notes:
1. Contours are measured in intervals of 50 feet.

Figure B-34
Net Shale Thickness Map - Anahuac Shale
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

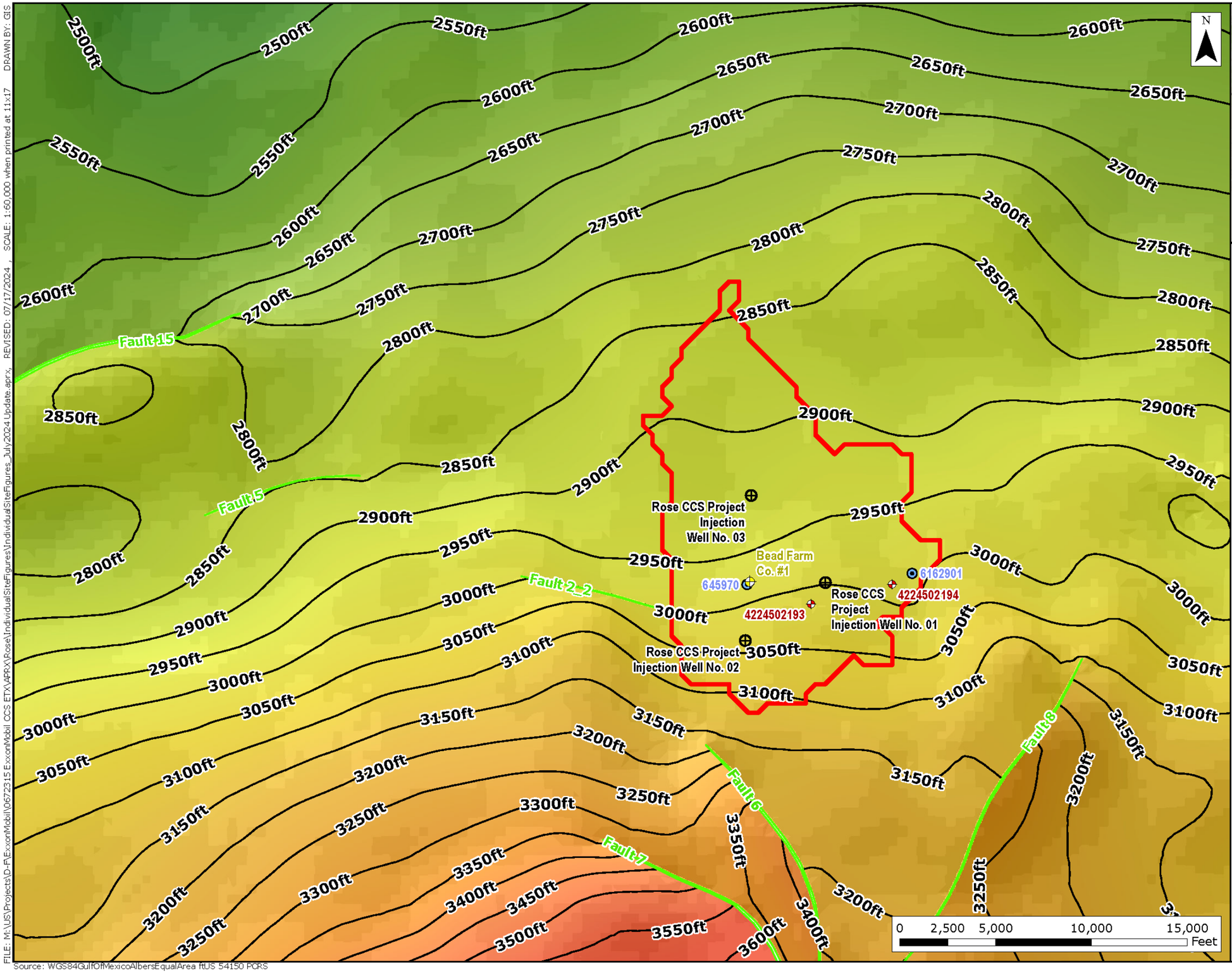
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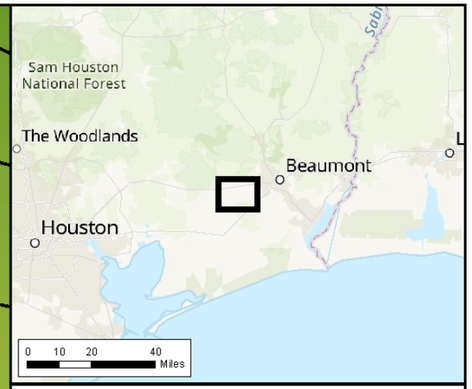
Claimed as PBI

Claimed as PBI

Claimed as PBI

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Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 3917 ft.

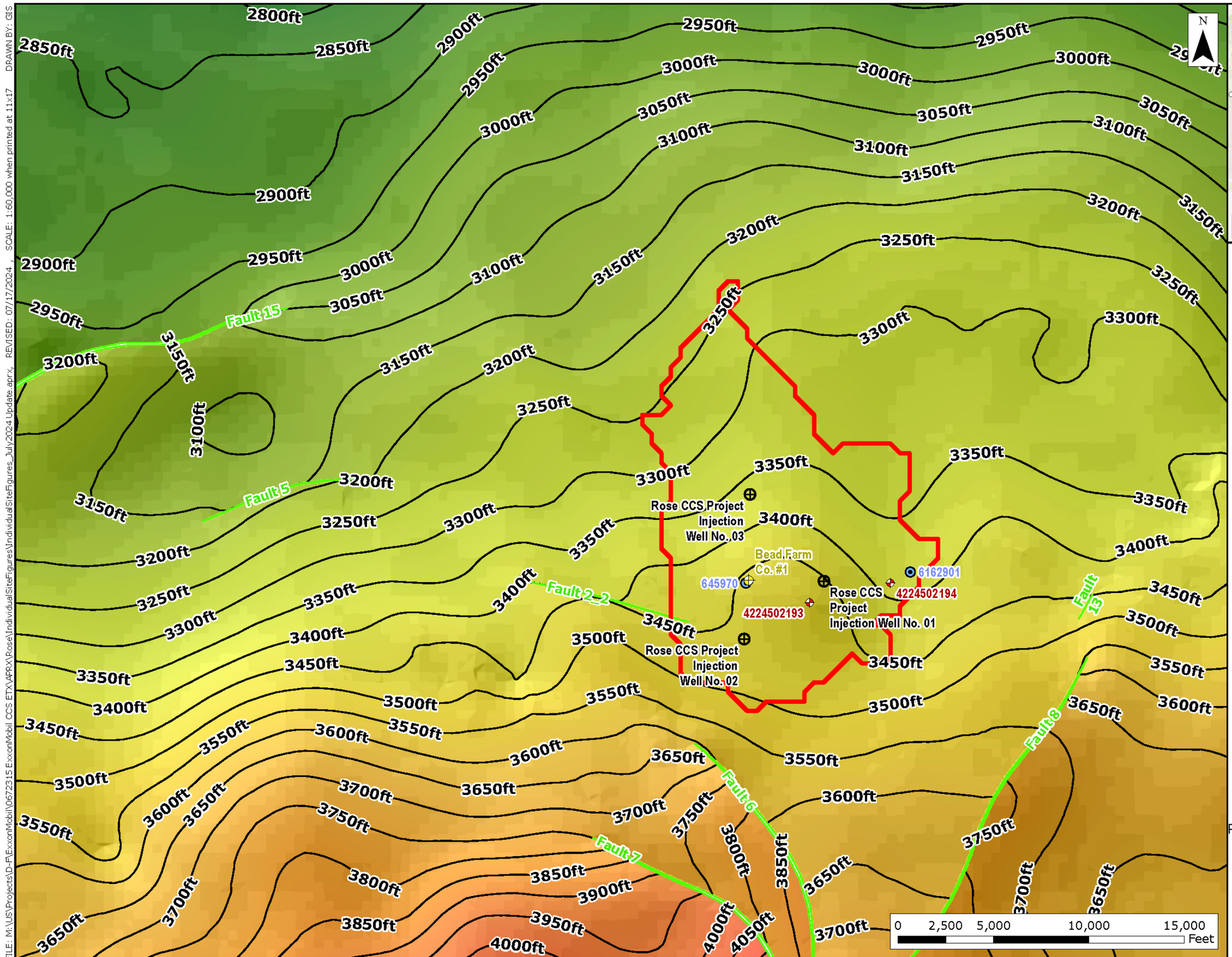
Low: 2308 ft.

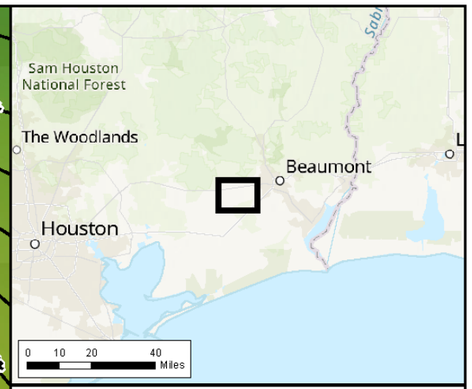
Notes:
1. Contours are measured in intervals of 50 feet.

Figure B-38
Local Structure Map - Top of Upper Composite Confining Zone
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 4477 ft.

Low: 2667 ft.

Notes:
1. Contours are measured in intervals of 50 feet.

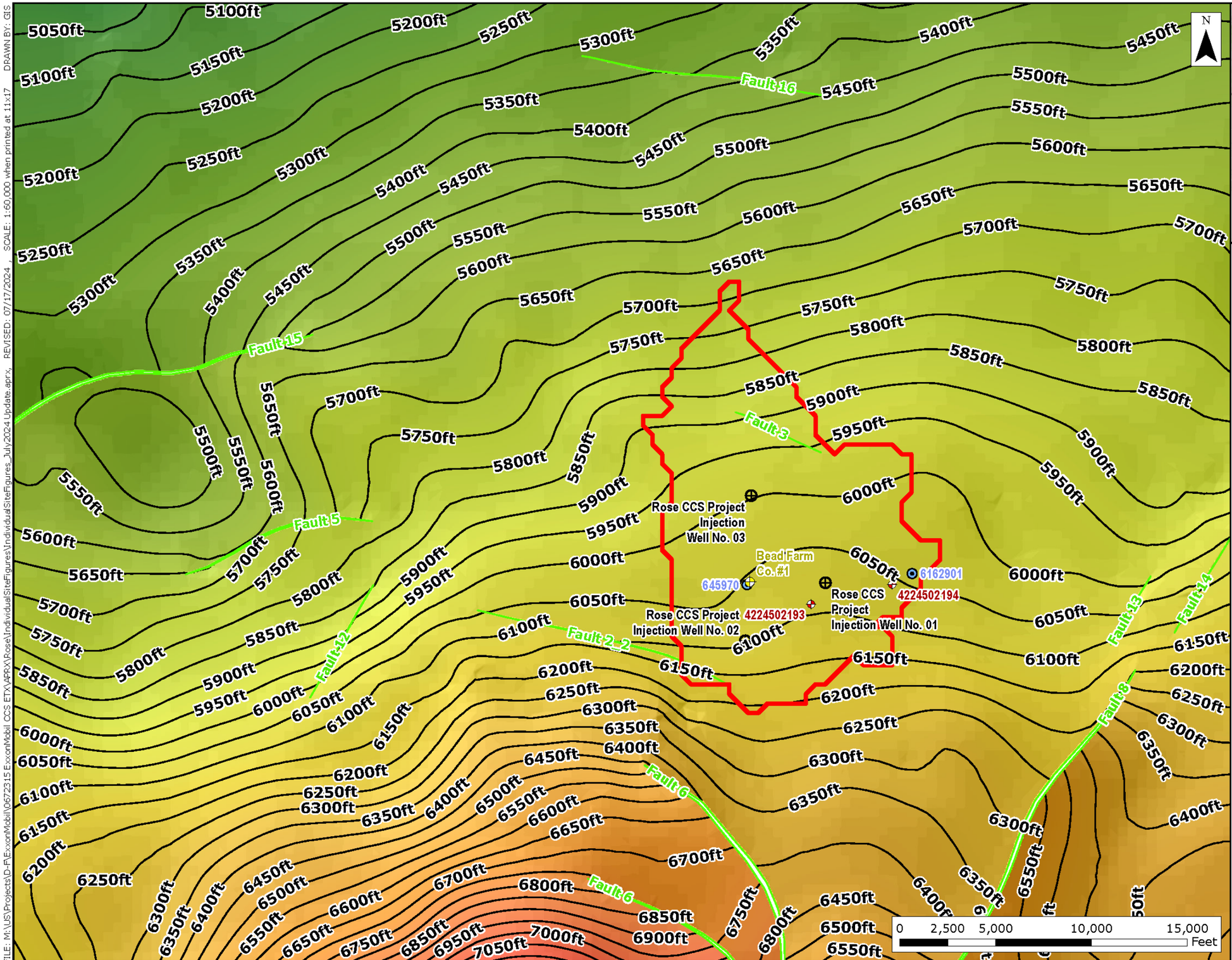
Figure B-39
Local Structure Map - Top of Fleming Injection Interval
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

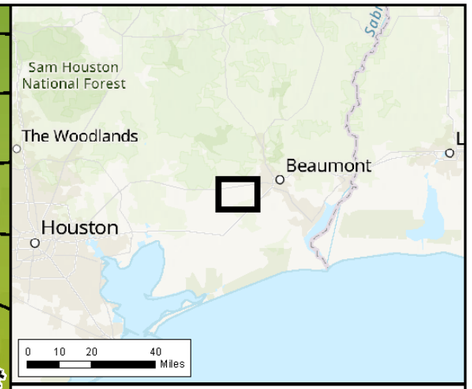
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Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS

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Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

- High: 8133 ft.
- Low: 4801 ft.

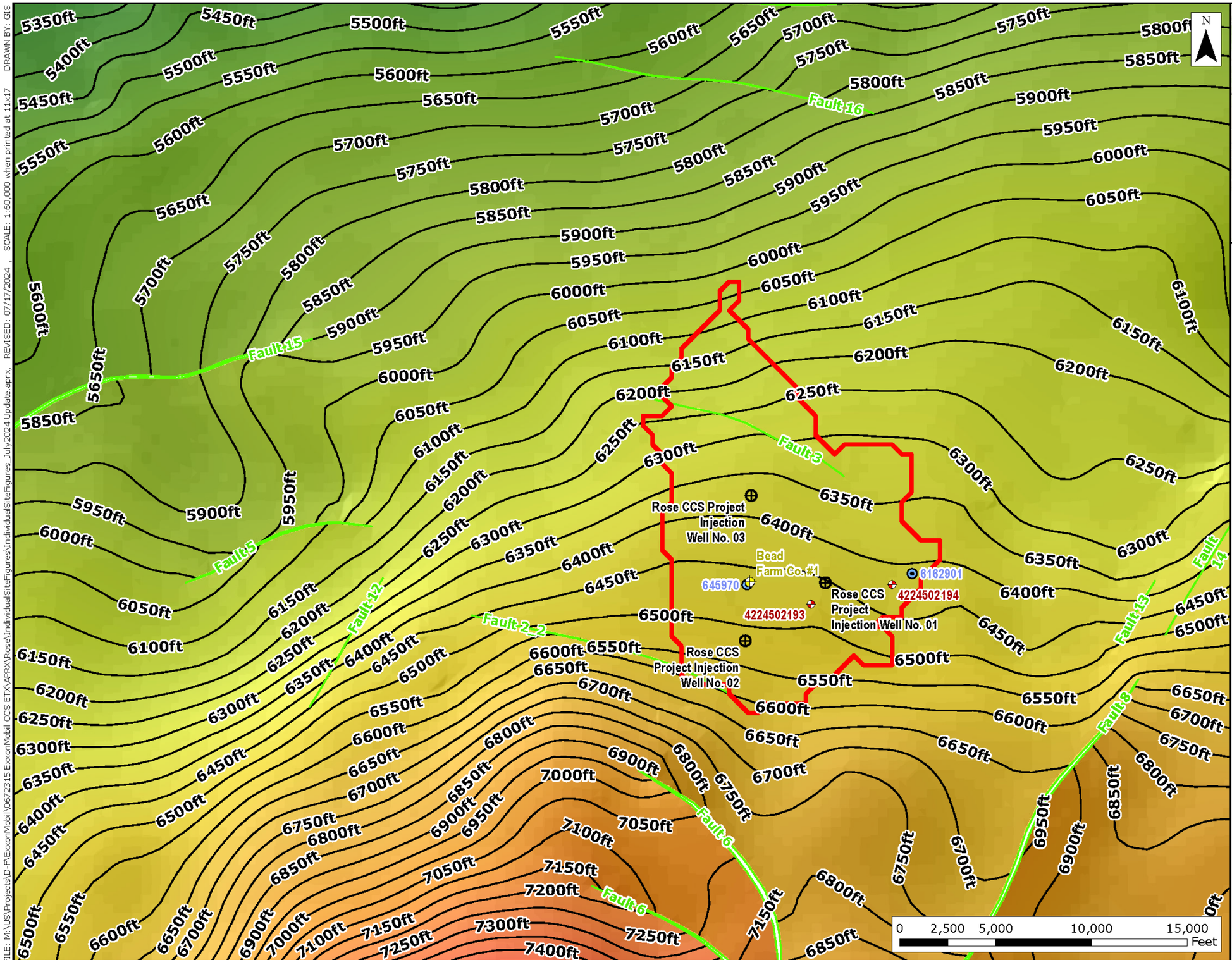
Notes:
1. Contours are measured in intervals of 50 feet.

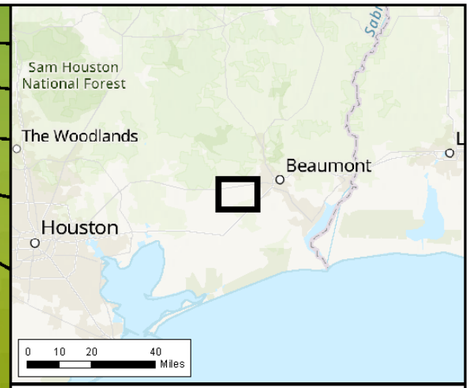
Figure B-40
Local Structure Map - Top of Anahuac Shale
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS

FILE: M:\US\Projects\D-FE\ExxonMobil\0672315 ExxonMobil CCS ETX\APRX\Rose\IndividualSiteFigures\IndividualSiteFigures_July2024 Update.aprx, REVISED: 07/17/2024 , SCALE: 1:60,000 when printed at 11x17 DRAWN BY: GIS





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Fault
- Contour

Depth

High: 8541 ft.

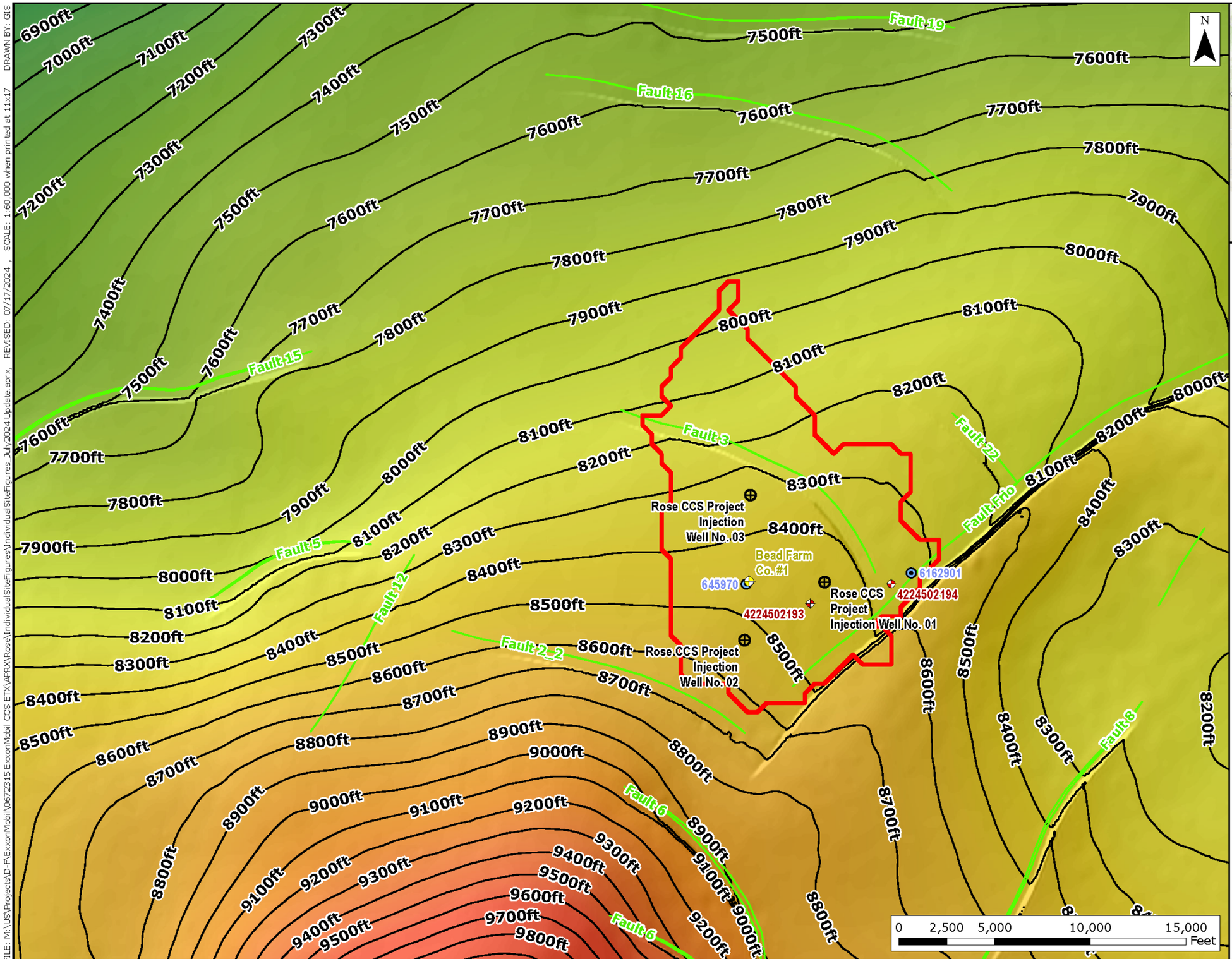
Low: 5088 ft.

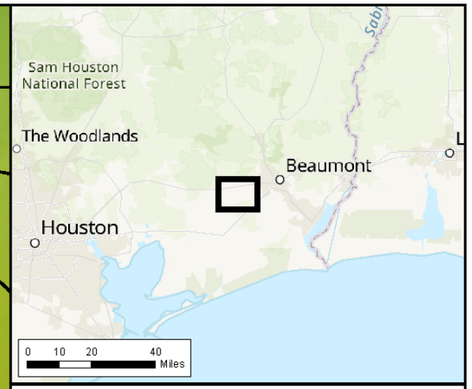
Notes:
1. Contours are measured in intervals of 50 feet.

Figure B-41
Local Structure Map - Top of Upper Frio Injection Interval
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS





Legend

- Area of Review
- Injection Well
- Water Well
- Bead Farm Co. #1
- Artificial Penetration within AoR
- Contour

Depth

High: 11179 ft.

Low: 6340 ft.

Notes:
1. Contours are measured in intervals of 100 feet.

Figure B-42
Local Structure Map -
Top of Lower Confining Zone
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon
Solutions Onshore Storage LLC
Jefferson County, Texas

ERM

FILE: M:\US\Projects\D-F\ExxonMobil\0672315 ExxonMobil CCS ETX\APRX\Rose\IndividualSiteFigures\IndividualSiteFigures_July2024 Update.aprx, REVISED: 07/17/2024 , SCALE: 1:60,000 when printed at 11x17 DRAWN BY: GIS
Source: WGS84GulfOfMexicoAlbersEqualArea ftUS 54150 PCRS

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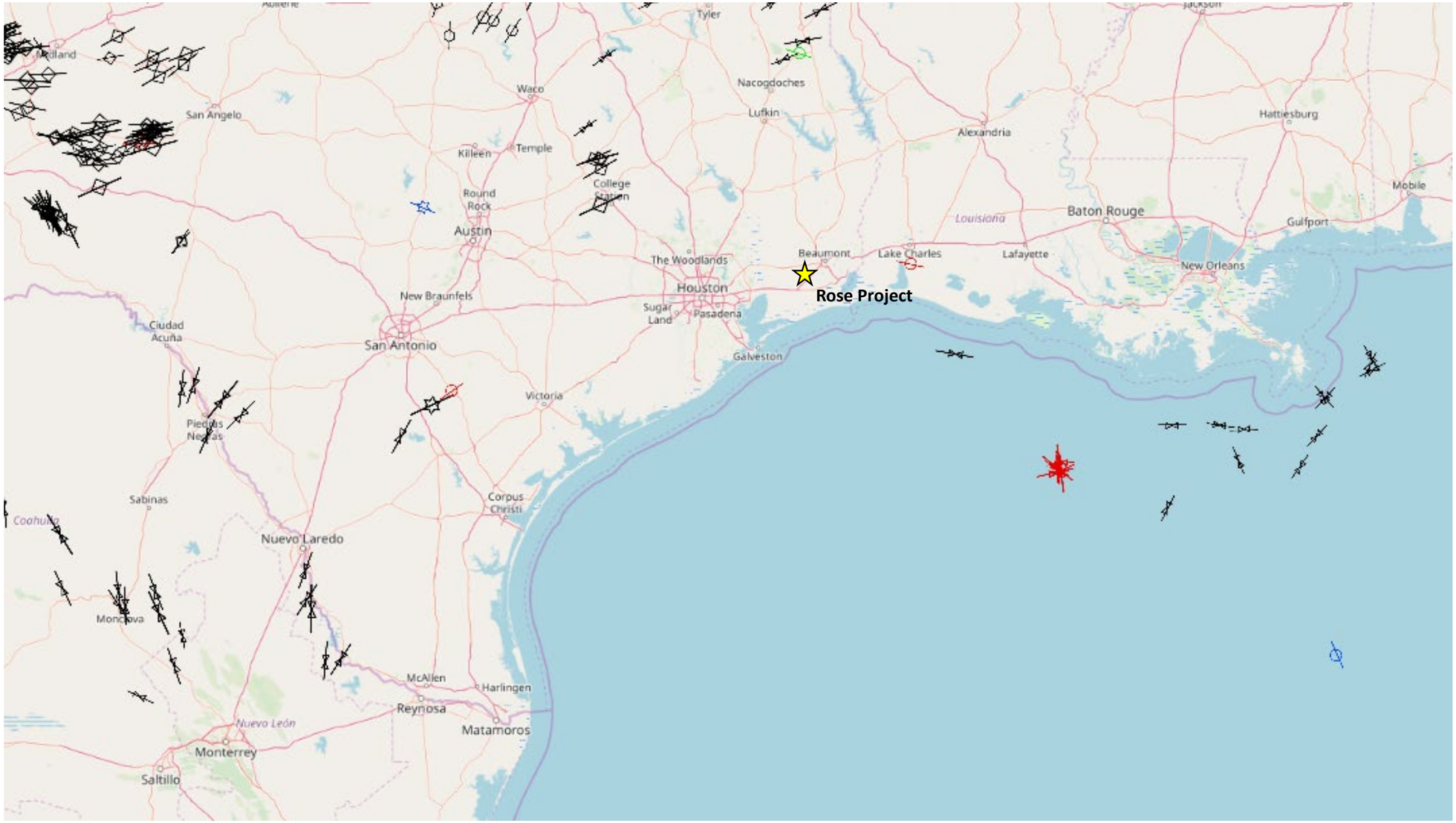
- focal mechanism
- drill. induced frac.
- hydro. fractures
- overcoring
- geol. indicators
- breakouts

Regime:

NF SS TF U

Quality:

A
B
C



Source: https://www.world-stress-map.org/

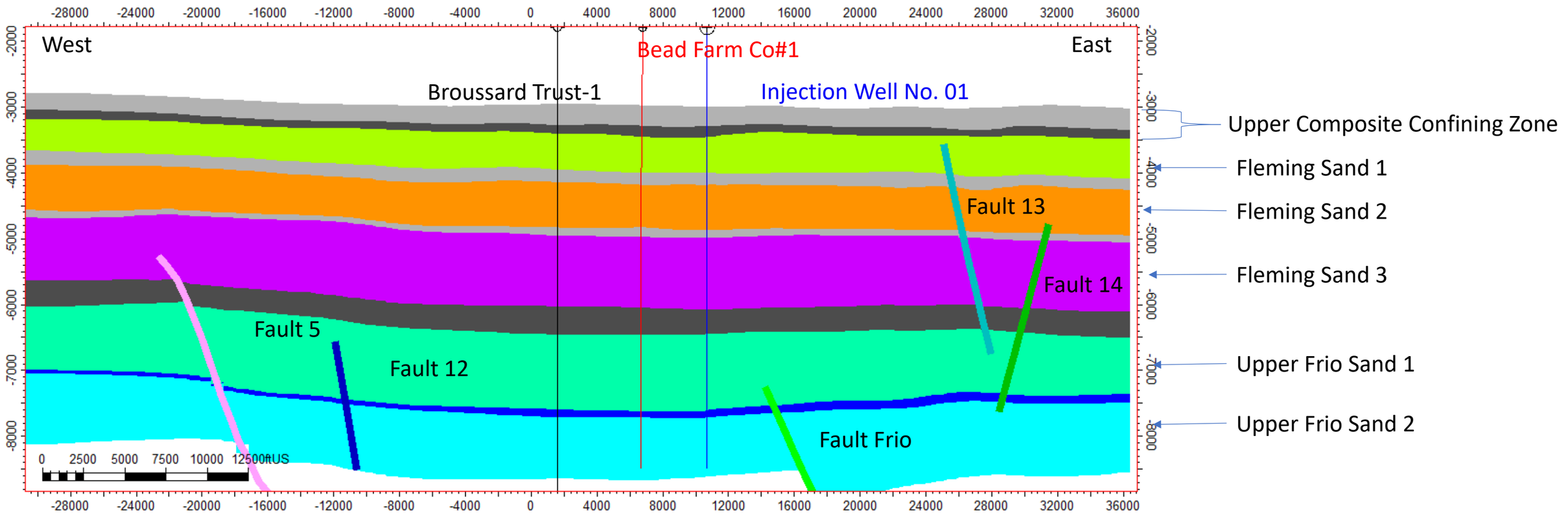
Figure B-50
World Stress Map – Maximum Horizontal Stress Orientations
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions
Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

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Claimed as PBI

Claimed as PBI



Symbol legend

- Upper Composite Confining Zone
- Fleming 1 Injection Zone
- Intra-Fleming Shale 1
- Fleming 2 Injection Zone
- Intra-Fleming Shale 2
- Fleming 3 Injection Zone
- Anahuac Seal
- Frio 1 Injection Zone
- Intra-Frio Shale 1
- Frio 2 Injection Zone
- Injector Well #1
- Broussard Trust - 1
- Bead Farm Co - 1

Figure B-53a
Model Structural Grid Cross Section (West-East)
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

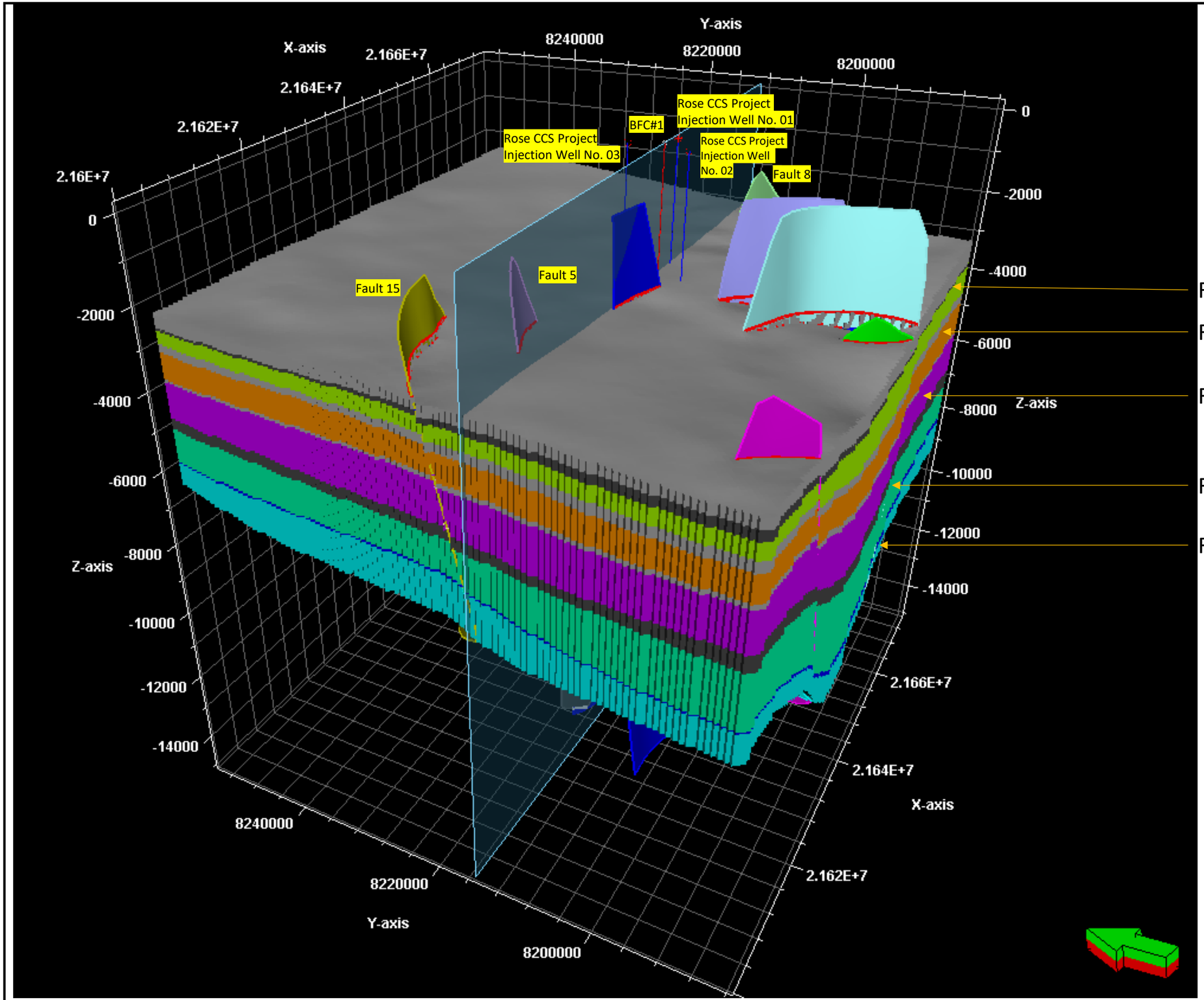


Figure B-53b
Model Structural Grid 3D View
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions
Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

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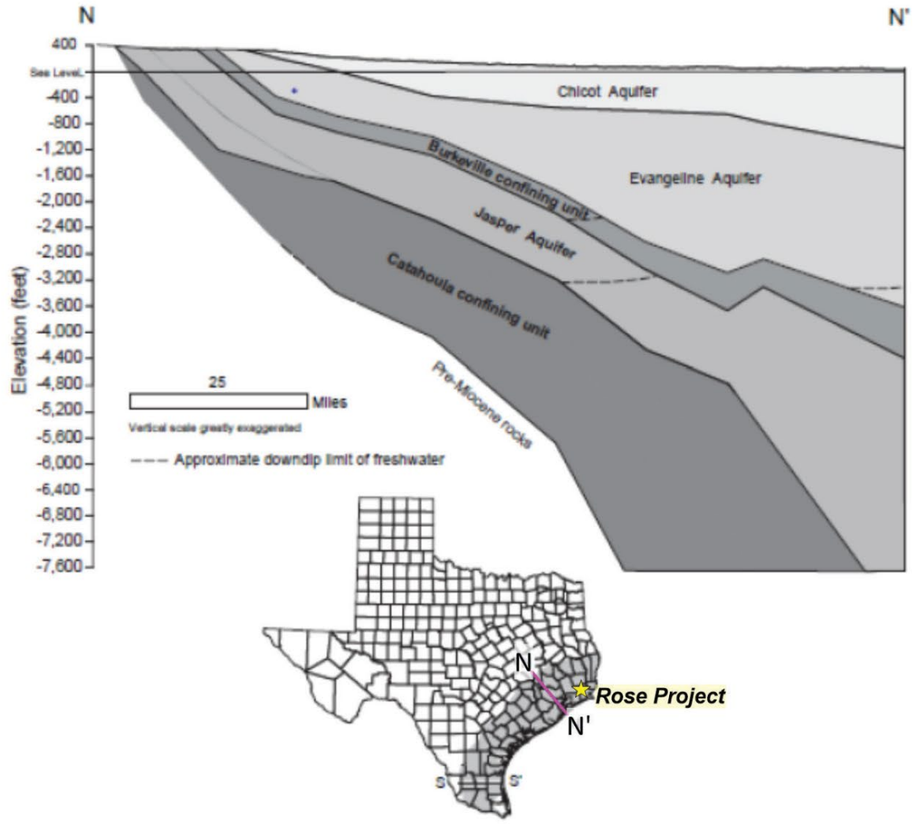
Claimed as PBI

ERA	Epoch		Est. Age (M.Y)	Geologic Unit	Hydrogeologic Unit
Cenozoic	Pleistocene		0.7	Beaumont	CHICOT AQUIFER
			1.6	Lissie	
	Pliocene		3.8	Willis	
	Miocene	Late	11.2	Upper Goliad	EVANGELINE AQUIFER
			14.5	Lower Goliad	
		Middle	17.8	Upper Lagarto	BURKEVILLE
				Middle Lagarto	
		Early		Lower Lagarto	JASPER AQUIFER
			24.2	Oakville	
	Oligocene		32	Frio	CATAHOULA
			34	Vicksburg	

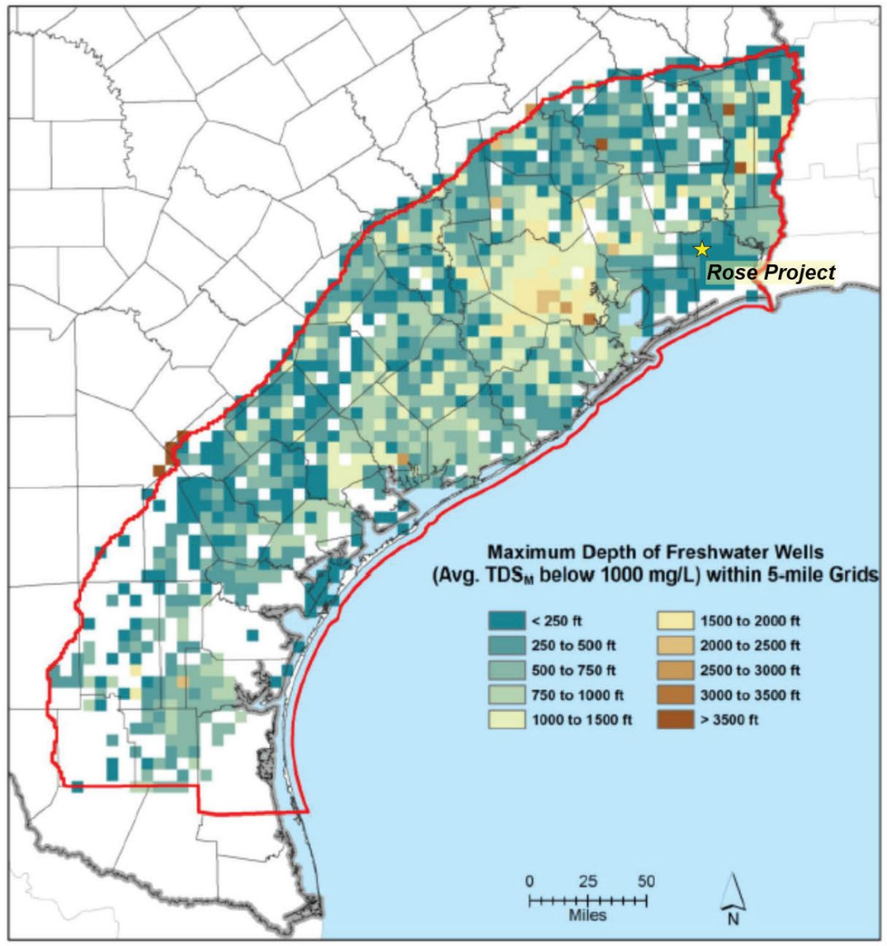
Source: Young, S.C., M. Jigmond, N. Deeds, J. Blainey, 2016. Final Report: Identification of Potential Brackish Groundwater Production Areas – Gulf Coast Aquifer System. Prepared by INTERA Inc., Austin TX; prepared for Texas Water Development Board, Contract Report Number 1600011947.

Figure B-73
General Hydrogeologic Column, Gulf Coast Aquifer
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions
Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM



Gulf Coast Aquifer Cross Section
(George et al., 2011, and others)

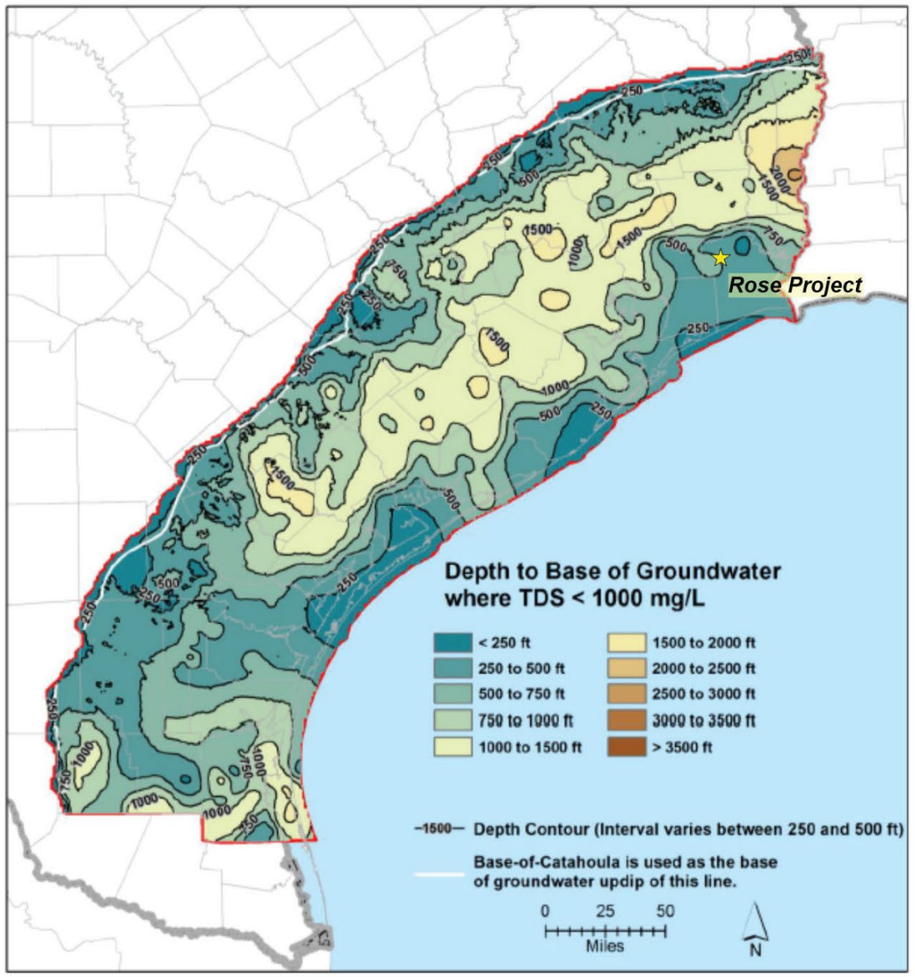


Maximum Depth of Freshwater Sampled by Wells in Grid of 5x5 Mile Blocks
(Young et al., 2016)

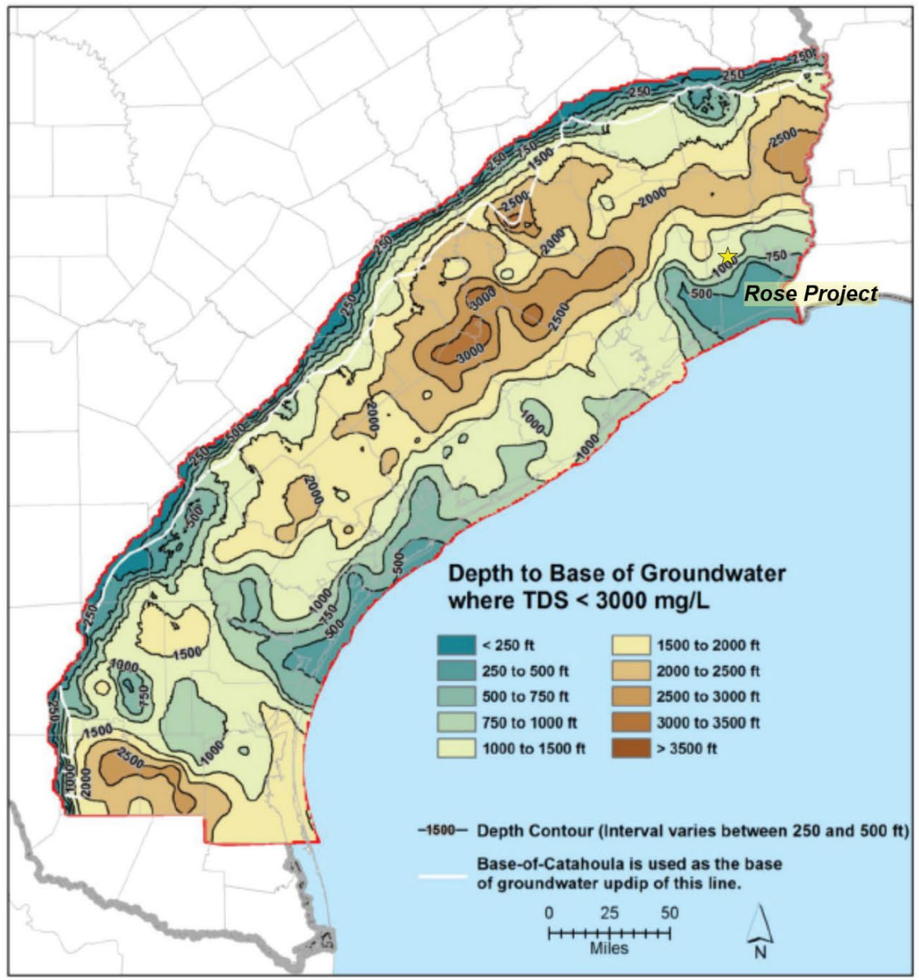
Source: Young, S.C., M. Jigmond, N. Deeds, J. Blainey, 2016. Final Report: Identification of Potential Brackish Groundwater Production Areas – Gulf Coast Aquifer System. Prepared by INTERA Inc., Austin TX; prepared for Texas Water Development Board, Contract Report Number 1600011947.

Figure B-74
Gulf Coast Aquifer Cross Section and Maximum Depth of Freshwater Wells
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions
Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM



Depth to Base of Groundwater, <1,000 mg/L TDS (Young et al., 2016)

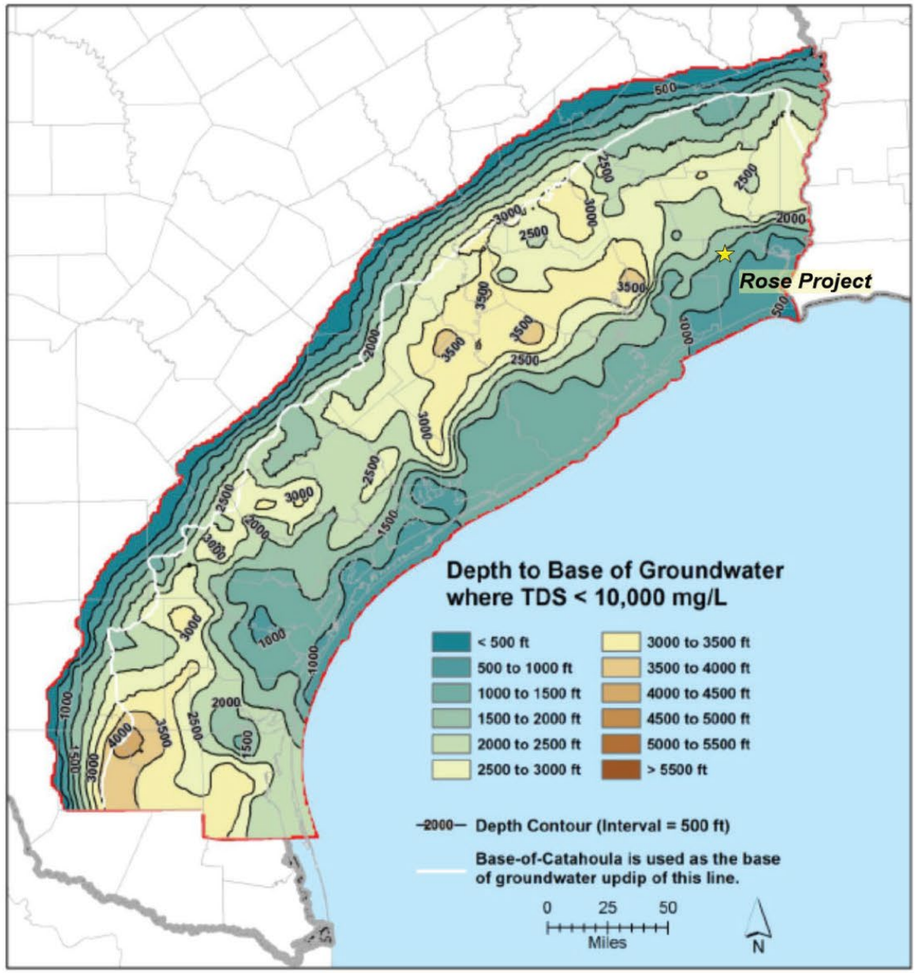


Depth to Base of Groundwater, <3,000 mg/L TDS (Young et al., 2016)

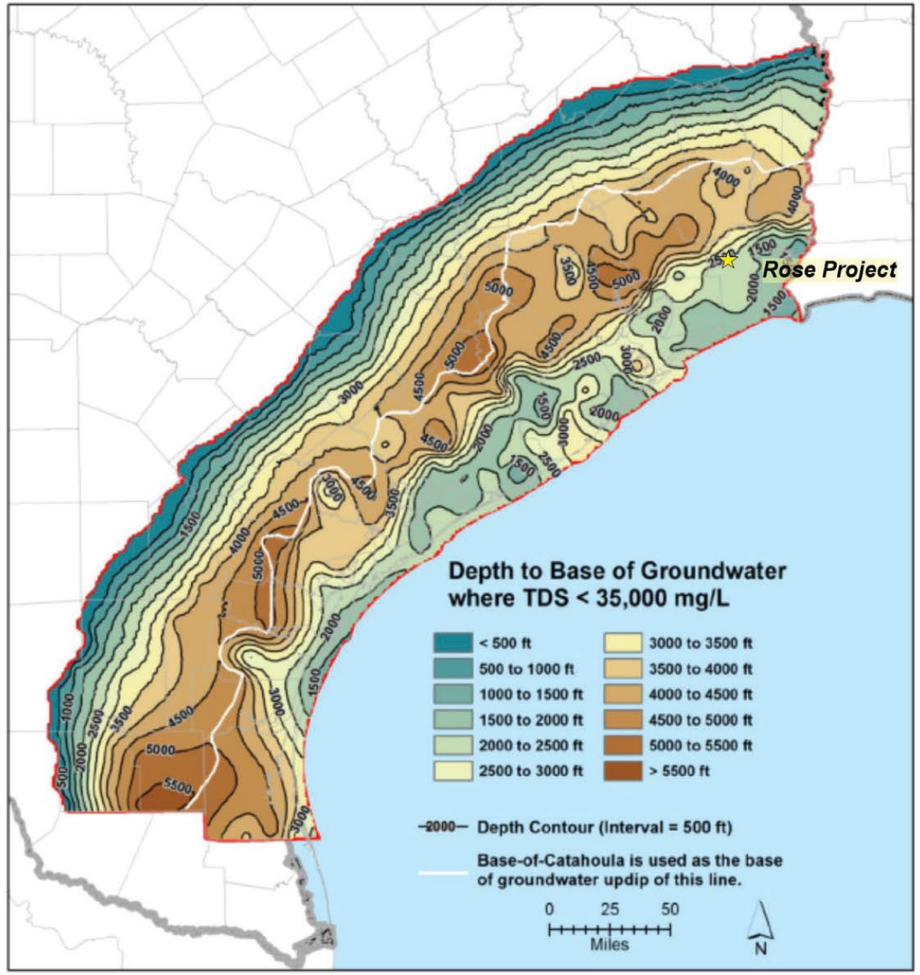
Source: Young, S.C., M. Jigmond, N. Deeds, J. Blainey, 2016. Final Report: Identification of Potential Brackish Groundwater Production Areas – Gulf Coast Aquifer System. Prepared by INTERA Inc., Austin TX; prepared for Texas Water Development Board, Contract Report Number 1600011947.

Figure B-75
Depth to Base of 1,000 mg/L and 3,000 mg/L TDS Groundwater
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions
Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM



Depth to Base of Groundwater, <10,000 mg/L TDS (Young et al., 2016)

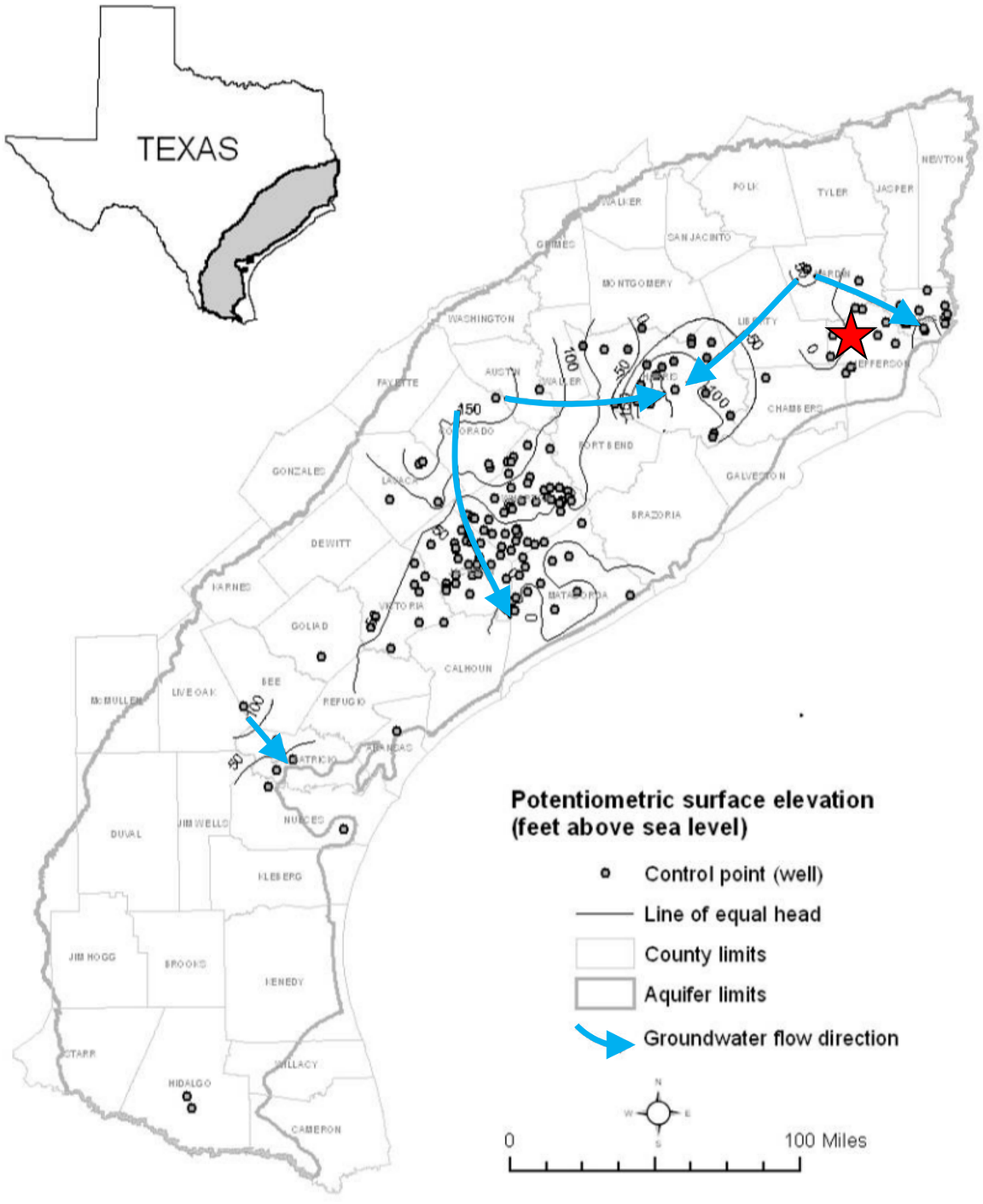


Depth to Base of Groundwater, <35,000 mg/L TDS (Young et al., 2016)

Source: Young, S.C., M. Jigmond, N. Deeds, J. Blainey, 2016. Final Report: Identification of Potential Brackish Groundwater Production Areas – Gulf Coast Aquifer System. Prepared by INTERA Inc., Austin TX; prepared for Texas Water Development Board, Contract Report Number 1600011947.

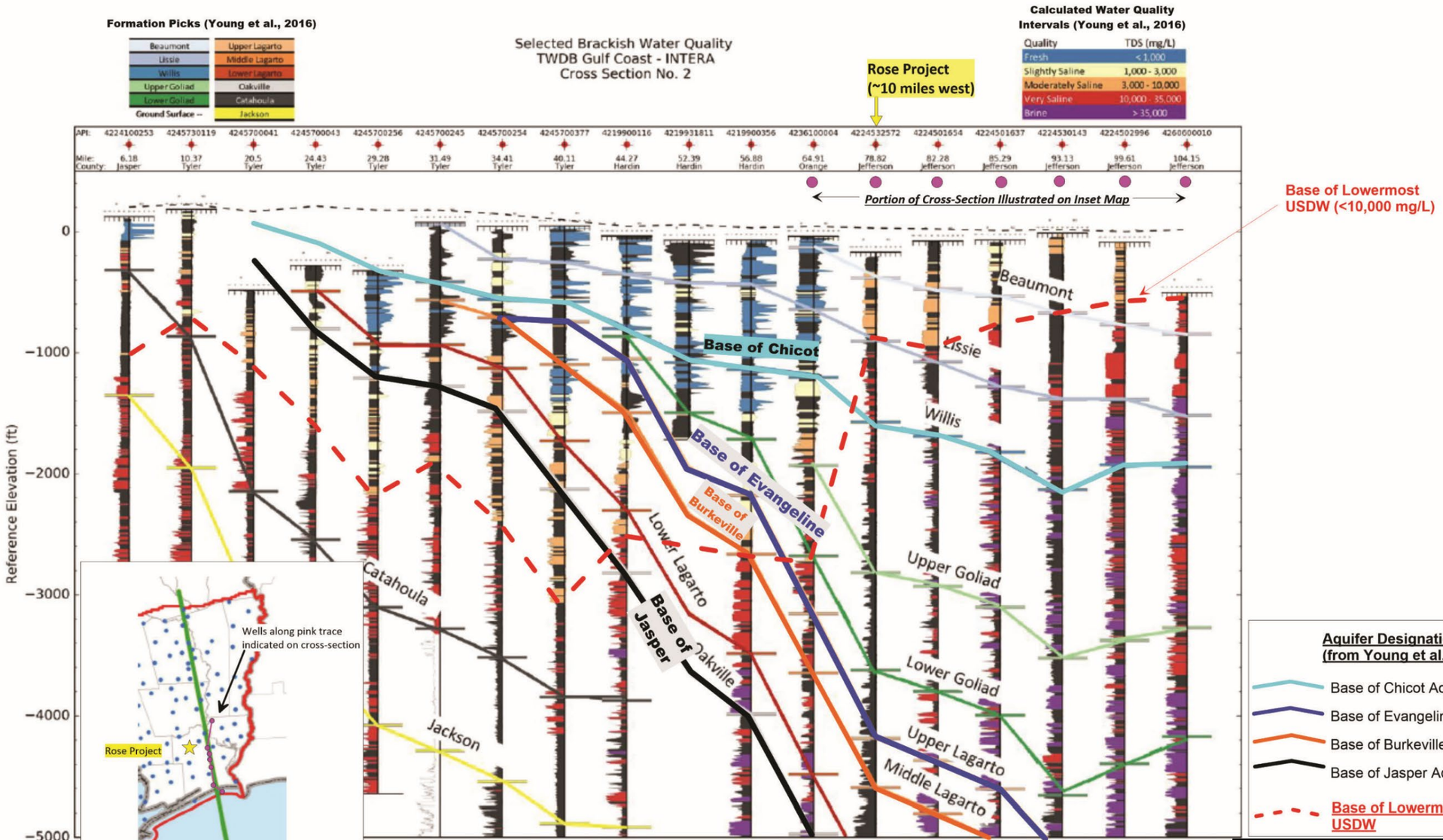
Figure B-76
Depth to Base of 10,000 mg/L and 35,000 mg/L TDS Groundwater
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions
Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM



Source: Chowdhury, A.H., Boghici, R., and Hopkins, J. (2006). Hydrochemistry, Salinity Distribution, and Trace Constituents: Implications for Salinity Sources, Geochemical Evolution, and Flow Systems Characterization, Gulf Coast Aquifer, Texas. Chapter 5 in: Mace, R.E. et al. (eds.), Aquifers of the Gulf Coast of Texas: Texas Water Development Board Report.

Figure B-77a
Potentiometric surface map of the Chicot aquifer with groundwater flow directions
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

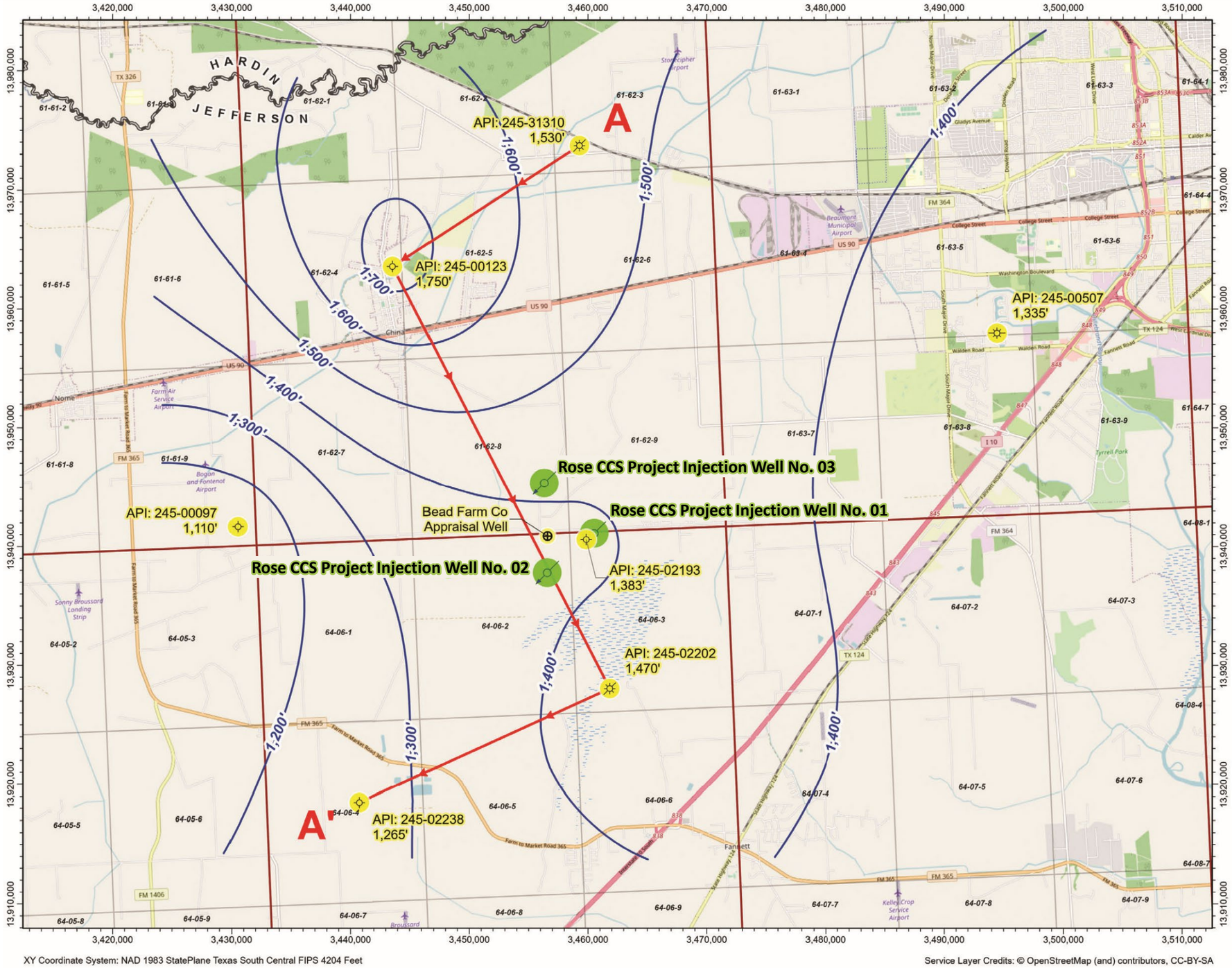


Source: Young, S.C., et al., 2016. FINAL REPORT: Identification of Potential Brackish Groundwater Production Areas - Gulf Coast Aquifer System. Prepared by INTERA Inc., Austin, TX; prepared for Texas Water Development Board, Contract report number 1600011947.

Figure B-77b
Aquifer Identification and Base of Lowermost USDW, Cross-Section No. 2
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions
Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

Source: Young, S.C., M. Jigmond, N. Deeds, J. Blainey, 2016. Final Report: Identification of Potential Brackish Groundwater Production Areas – Gulf Coast Aquifer System. Prepared by INTERA Inc., Austin TX; prepared for Texas Water Development Board, Contract Report Number 1600011947.



XY Coordinate System: NAD 1983 StatePlane Texas South Central FIPS 4204 Feet

Service Layer Credits: © OpenStreetMap (and) contributors, CC-BY-SA

Rose Project Area

- Proposed Well Location
- Bead Farm Co Appraisal Well (API: 245-32908)

Oil and Gas Wells Evaluated for Water Quality

- Abandoned Gas Producer
- Dry and Abandoned
- Temporarily Abandoned Gas Well

Cross Section Reference Trace

- A - A'

Contours

- Depth to Base of Lowermost USDW

Note:
Contour interval = 100 feet
All depths contoured and presented are based on log depths.

Well data from S&P Global Oil & Gas Well Database (Previously IHS), accessed and downloaded 05/22/2023.

0 0.75 1.5 2.25 3 Miles

1 inch = 1.5 miles

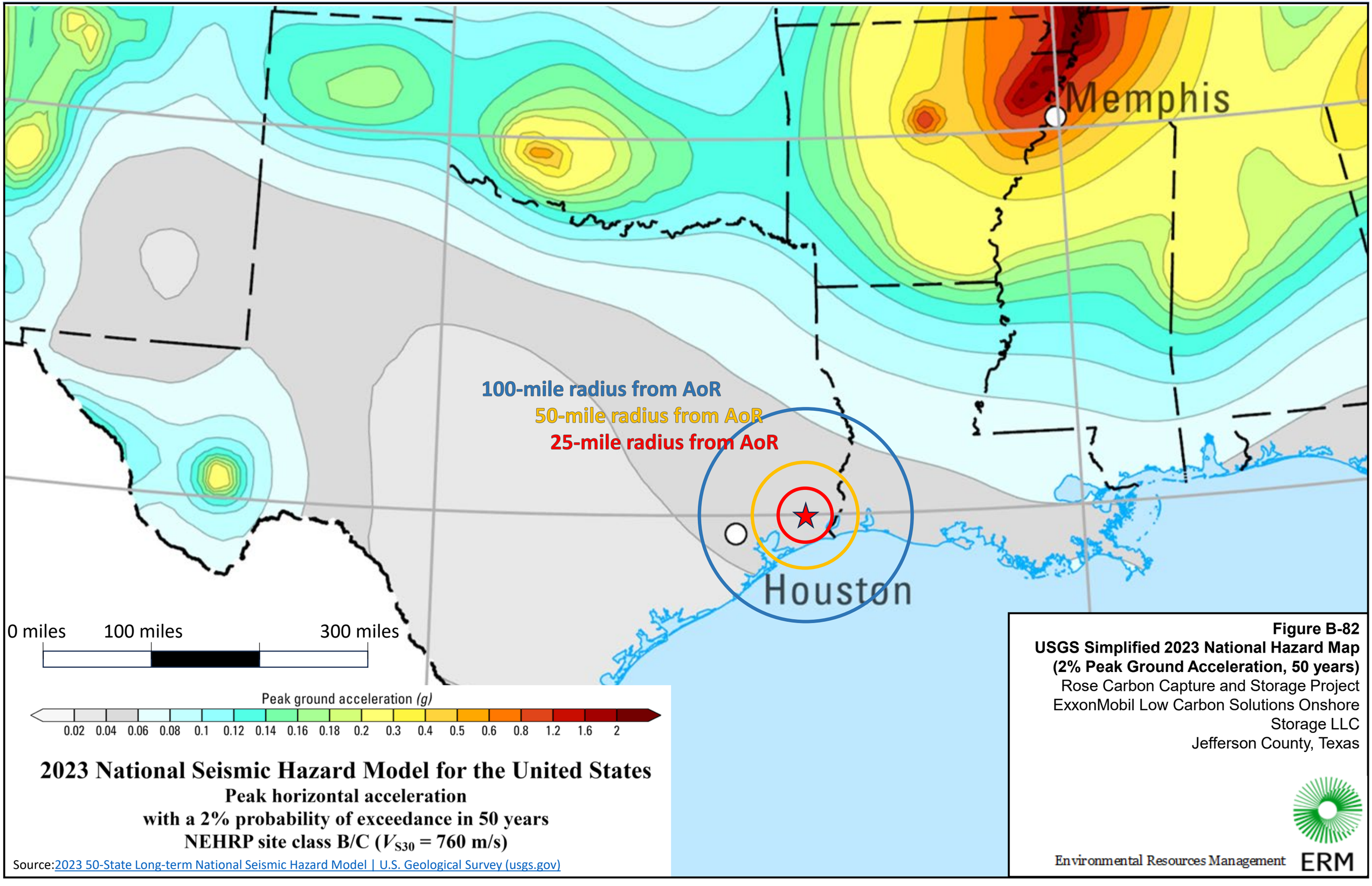
Figure B-78
Oil and Gas Wells Evaluated for Water Quality and Cross Section Location Map & Depth to Base of the Lowermost USDW Contour Map
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

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Source:2023 50-State Long-term National Seismic Hazard Model | U.S. Geological Survey (usgs.gov)

Figure B-82
USGS Simplified 2023 National Hazard Map
(2% Peak Ground Acceleration, 50 years)
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

Environmental Resources Management ERM

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Appendix B Site Characterization Files

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Appendix B.1 Bead Farm Company No. 1 Core Field Analyses

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Appendix B.2 Bead Farm Company No. 1 Laboratory Analyses

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Appendix B.3 Bead Farm Company No. 1 Injectivity Test Report

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Appendix B.4 Geochemical Model Tables

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Appendix B.5 Conventional Core Fracture Evaluation and Potential USDW Impact Assessment

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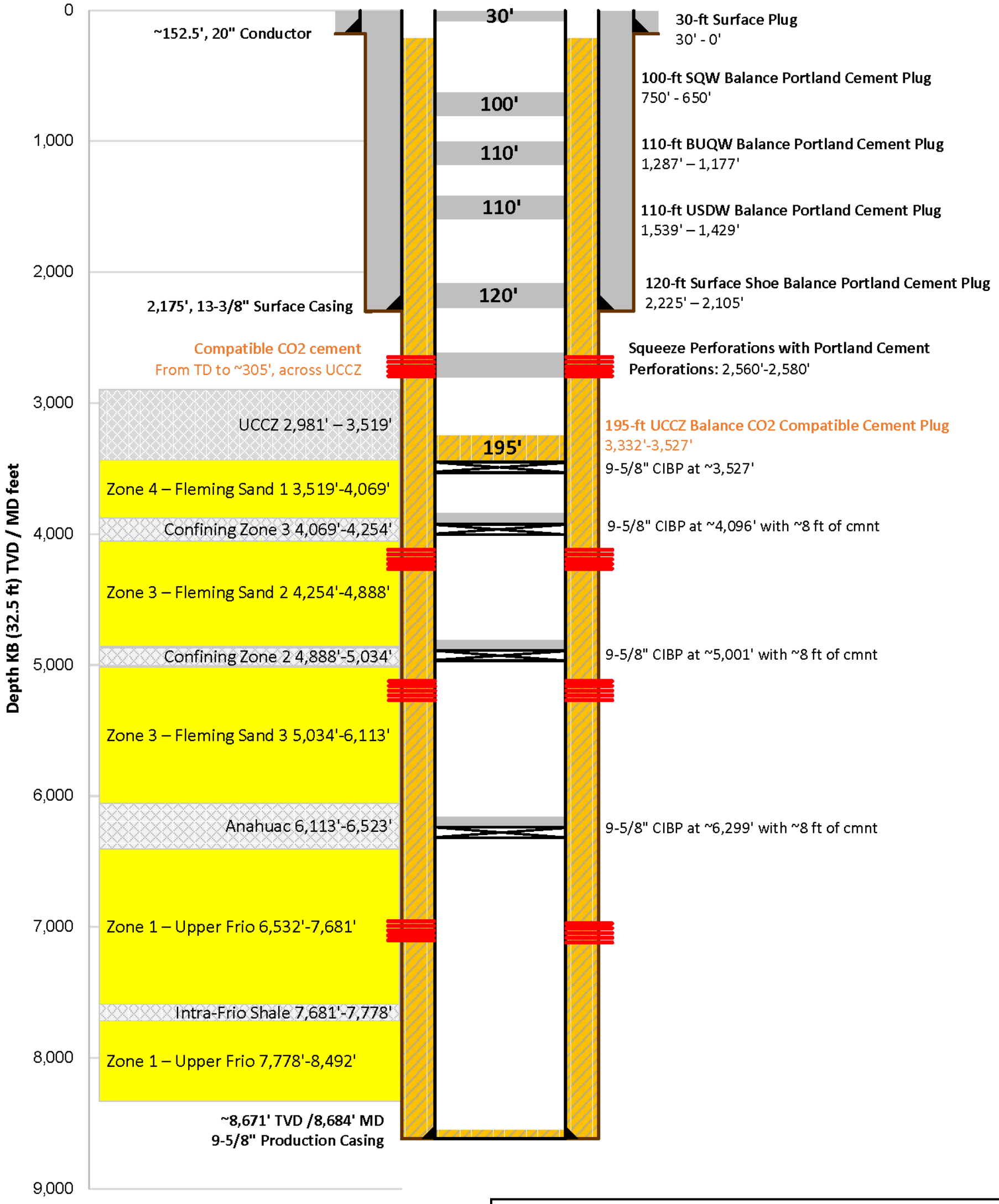
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Appendix C Area of Review Maps and Corrective Action Well Schematics

Rose CCS Project Bead Farm 1

P&A Post Recomplete

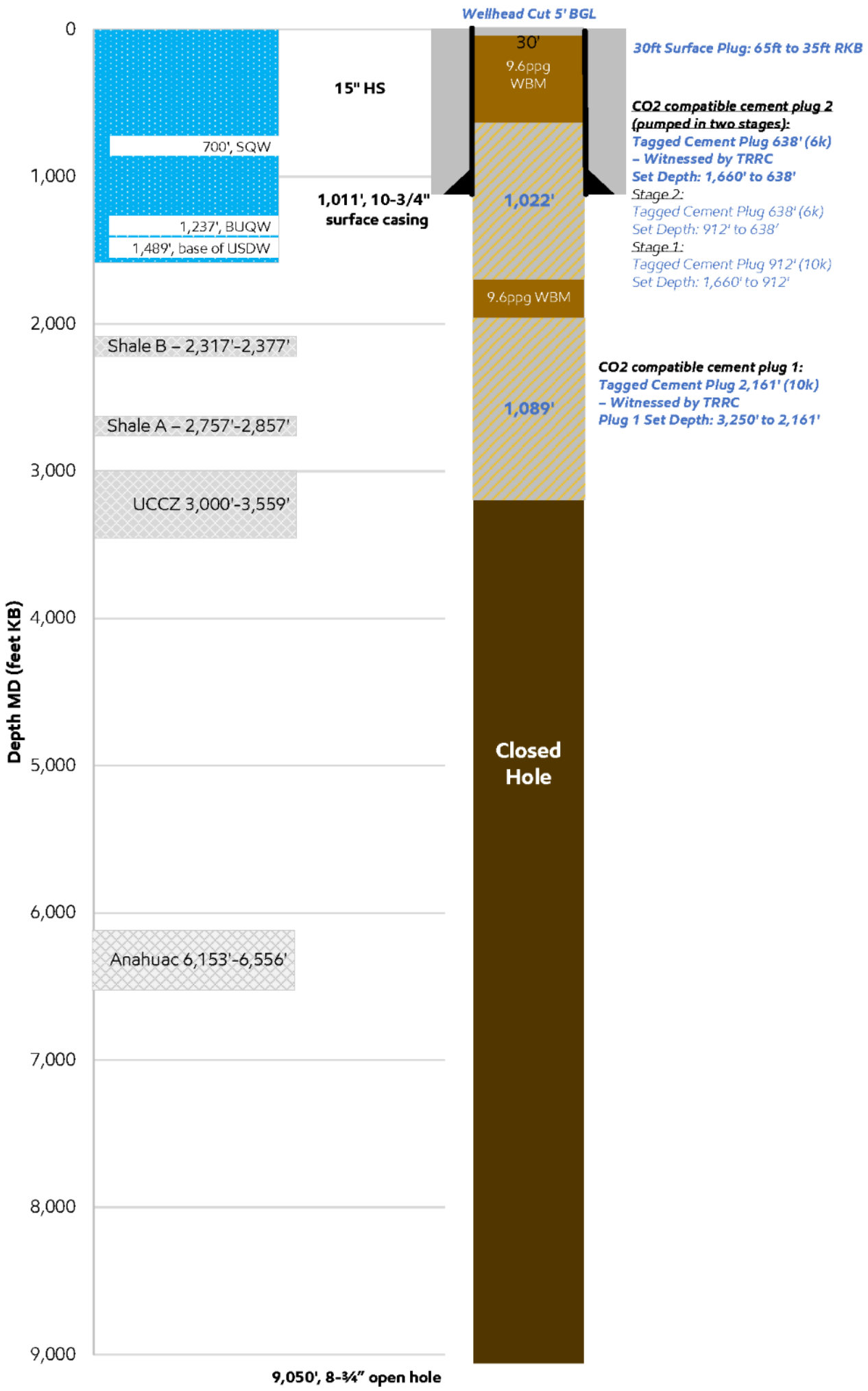


N/A – Not Available

Appendix C-1
Bead Farm Co. #1, Rose Stratigraphic Well
Corrective Action Schematic
API 4224532908
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, TX

ERM

Broussard JE Jr-1
(API 4224502193)
Final P&A

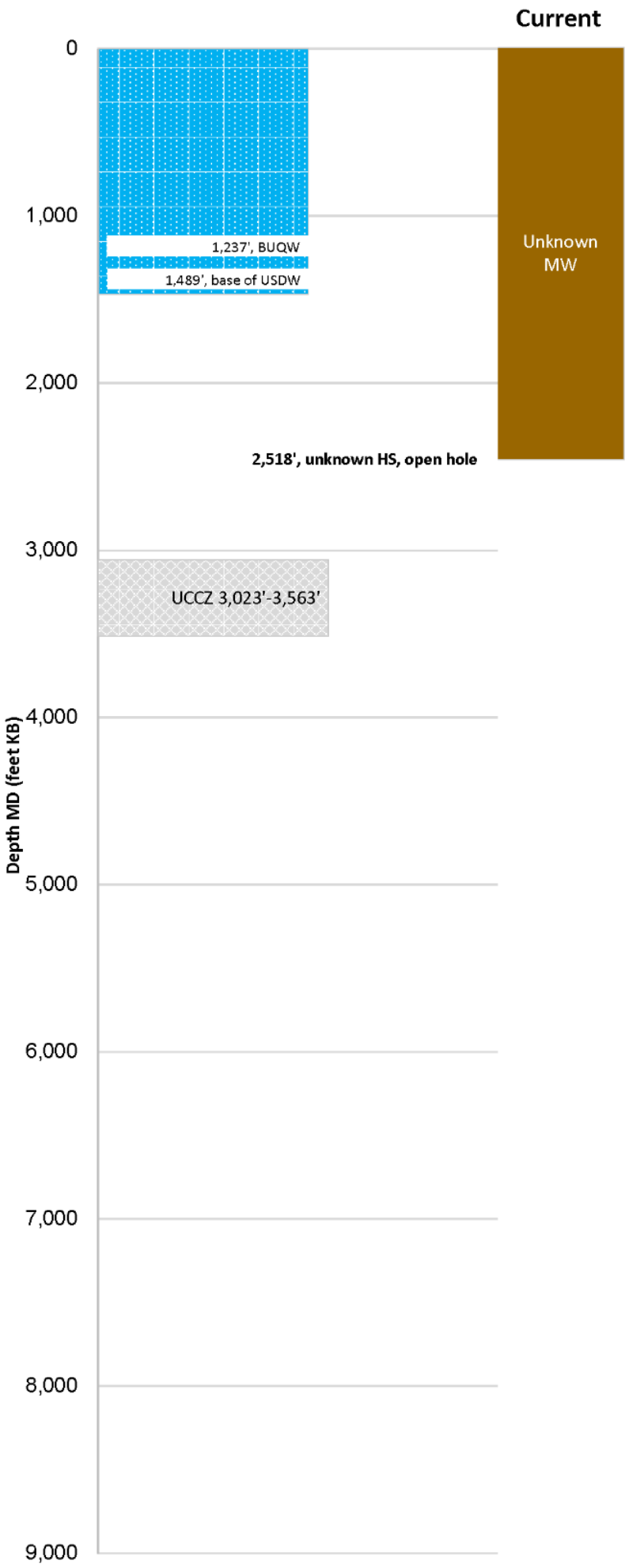


N/A – Not Available

Appendix C-2
Broussard JE Jr-1 Well Corrective Action Schematic
API 4224502193
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, TX

ERM

Broussard J. E. Etal-1 (API 4224502194)
(29.999730, -94.274070) - NAD83



KB:	N/A
GL:	N/A

Casing/Tubing Information	
Label	N/A
Type	N/A
OD	N/A
ID	N/A
Drift ID	N/A
COD	N/A
Weight	N/A
Grade	N/A
Hole Size	N/A
Depth Set	2518'
TOC	N/A
Cement	N/A

Spud:	N/A
Plug:	N/A

N/A – Not Available

Appendix C-3
Broussard J.E. Etal-1 Well Schematic
API 4224502194
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, TX

ERM

Appendix C-4 Aeromagnetic Survey Technical Report

CONFIDENTIAL BUSINESS INFORMATION

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CONFIDENTIAL BUSINESS INFORMATION

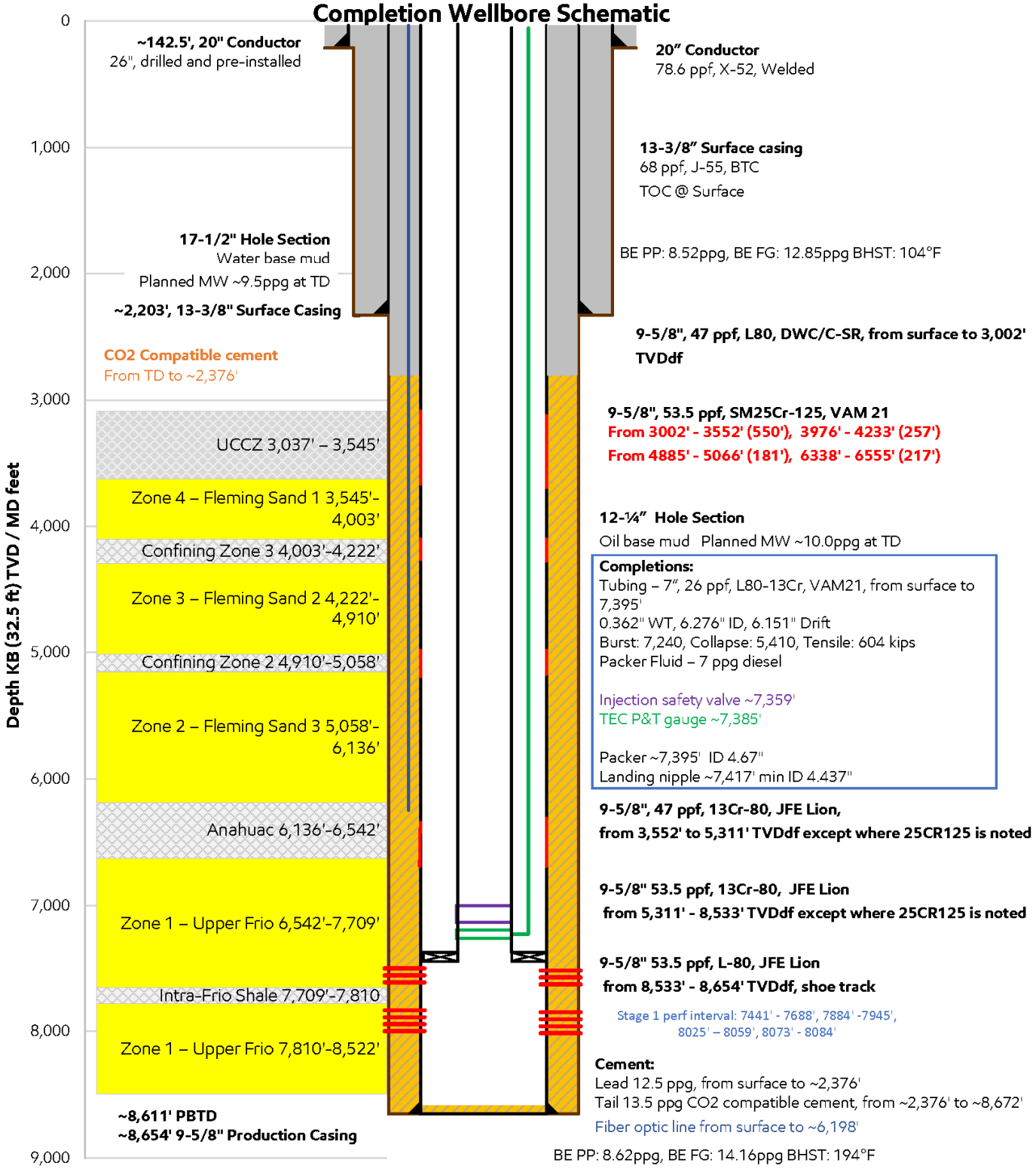
Claimed as PBI

Appendix C-5: Artificial Penetration Records

4224532913 Labelle Properties Ltd No. 1 (Rose CCS Project Injection Well No. 01)

CONFIDENTIAL BUSINESS INFORMATION

Labelle Properties Ltd No. 1
Rose CCS Project Injection Well No. 01
Completion Wellbore Schematic



ERM

Appendix D.1
Completions Wellbore Schematic for Rose CCS Project Injection Well No. 01
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, TX

CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32913
Drilling Permit # 898448
SWR Exception

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256

2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC

3. Operator Address (include street, city, state, zip): ATTN EDWARD E GRAHAM, 22777 SPRINGWOODS VILLAGE PKWY, SPRING, TX 77389-0000

4. Lease Name: LABELLE PROPERTIES LTD

5. Well No.: 1

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 10000

9. Do you have the right to develop the minerals under any right-of-way ? [X] Yes [ ] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03

12. County: JEFFERSON

13. Surface Location [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 4.5 miles in a SE direction from China which is the nearest town in the county of the well site.

15. Section: 42

16. Block:

17. Survey: T&NO RR CO/STARK, W L

18. Abstract No.: A-874

19. Distance to nearest lease line: ft.

20. Number of contiguous acres in lease, pooled unit, or unitized tract: 569.27

21. Lease Perpendiculars: 371 ft from the NORTH line and 2016 ft from the WEST line.

22. Survey Perpendiculars: 371 ft from the NORTH line and 2016 ft from the WEST line.

23. Is this a pooled unit? [ ] Yes [X] No

24. Unitization Docket No:

25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION — List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	8700	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks
See W1 Comments attached

Certificate:
I certify that information stated in this application is true and complete, to the best of my knowledge.

Josh Calkin — Name of filer
Mar 27, 2024 — Date submitted

(281)702-5537 — Phone
Josh.Calkin@erm.com — E-mail Address (OPTIONAL)

RRC Use Only Data Validation Time Stamp: Mar 26, 2025 1:44 PM(Current Version)

CONFIDENTIAL BUSINESS INFORMATION

Permit Status: Approved

The RRC has not approved this application. Duplication or distribution of information is at the user's own risk.

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC. A certification of the automated data is available in the RRC's Austin office.

W-1 Comments

Permit # 898448

Approved Date: Apr 05, 2024

[RRC STAFF Mar 28, 2024 4:28 PM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 4, 2024 9:05 AM]: Problems identified with this permit are resolved.; [RRC STAFF Apr 4, 2024 9:06 AM]: Per Joshua Calkin, "This well is being drilled as a stratigraphic well to gather data. At a future date, the well may be re-completed on a future date for injection."; [RRC STAFF Apr 4, 2024 9:06 AM]: Amended plat uploaded; [RRC STAFF Apr 4, 2024 9:24 AM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 5, 2024 8:06 AM]: Problems identified with this permit are resolved.; [RRC STAFF Apr 5, 2024 8:07 AM]: Per phone conversation with Josh Calkin, this is not a pooled unit.; [RRC STAFF Apr 5, 2024 8:12 AM]: Corrected acreage from 600 acres to 569.27 acres per plat and problem response from filer.

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898448	Apr 05, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32913	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	569.27

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
LABELLE PROPERTIES LTD	1
LOCATION	**TOTAL DEPTH**
4.5 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 42 BLOCK ABSTRACT 874

SURVEY T&NO RR CO/STARK, W L

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
371 ft. NORTH 2016 ft. WEST	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
371 ft. NORTH 2016 ft. WEST	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	569.27	8,700	1	03
LABELLE PROPERTIES LTD			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	31 December 2024	**GAU Number:**	389625

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532913
		County:	JEFFERSON
		Lease Name:	LaBelle Properties, Ltd
		Lease Number:	
Operator No.:	101256	**Well Number:**	1
		Total Vertical	10000
		Latitude:	29.999463
		Longitude:	-94.284922
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-T&NO RR CO/STARK, W L; Abstract-874; Section-42

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Initial Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1,225 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1,450 feet at the site of the referenced well.

*(SIP Purpose Only) Water Code Section 27.046(a) requires the GAU to issue a GW-2 letter containing Non-Endangerment language prior to issuance of a class VI permit. An additional letter will be required before SIP can issue a final permit because this letter is silent on endangerment of fresh water. *

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 12/18/2024. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	28 January 2025	**GAU Number:**	390197

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532913
		County:	JEFFERSON
		Lease Name:	LaBelle Properties, Ltd
		Lease Number:	
Operator No.:	101256	**Well Number:**	1
		Total Vertical	10000
		Latitude:	29.999463
		Longitude:	-94.284922
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-T&NO RR CO/STARK, W L; Abstract-874; Section-42

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1200 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1450 feet at the site of the referenced well.

This recommendation is applicable to an area extent within a radius of 1.0 mile of this location.

The vertical geological isolation from both bases of usable quality water and underground source of drinking water is at 3,200 feet in TVD depth (for UIC Purpose Only).

Injection into the subsurface interval from 3,400 to 8,600 feet in TVD depth, as proposed in the submitted W14 (Class VI) application dated on December 18th of 2024 , WILL NOT ENDANGER the PROTECTED WATER STRATA geologically at the proposed location in this area (for UIC Purpose Only).

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 01/22/2025. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 02/12/2025
Tracking No.: 326094

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-0000

WELL INFORMATION

API 42-245-32913 **County:** JEFFERSON
Well No.: 1 **RRC District** 03
Lease LABELLE PROPERTIES LTD **Field** WILDCAT
RRC Lease 28199 **Field No.:** 00006001
Location Section: 42, Block: , Survey: T&NO RR CO/STARK, W L, Abstract: 874

Latitude 29 **Longitud** -94
This well is 4.5 **miles in a** SE
direction from CHINA,
which is the nearest town in the

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 10/03/2024

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	04/05/2024	898448
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 06/23/2024 **Date of first production after rig** 10/03/2024
Date plug back, deepening, drilling operation 06/23/2024 **Date plug back, deepening, recompletion, drilling operation** 10/03/2024
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 569.27 **Elevation** 23 GL
Total depth TVD 8672 **Total depth MD**
Plug back depth TVD 8612 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing Is Cementing Affidavit (Form W-15)** 42.0 Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:

Location of well, relative to nearest lease of lease on which this well is 371.0 **Feet from the** North **Line and** 2016.0 **Feet from the** West **Line of the** LABELLE PROPERTIES LTD **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1200.0	**Date**	03/07/2024
SWR 13 Exception		**Depth**	2230.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
1	Surface	13 3/8	17 1/2	2203			H	1204	2382.0	0	Circulated to Surface
2	Conductor	20	26	110			A	225	349.0	0	Circulated to Surface
3	Conventional Production	9 5/8	12 1/4	8654			H	2035	3829.3	0	Circulated to Surface

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
1	7	7395	7395 / WIRELINE SET, PERMANENT

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
1	No	L 7441	7688.0
2	No	L 7884	7945.0
3	No	L 8073	8084.0
4	No	L 8025	8059.0

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG) hydraulic fracturing

Actual maximum pressure (PSIG) during fracturin

Has the hydraulic fracturing fluid disclosure been No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)	
1	Other	PERFORATIONS	7441	8059

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
CAPROCK - DISPOSAL	No			No	NOT ENCOUNTERED
SPINDLETOP SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
FANNETT SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
BIG HILL SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
PLEISTOCENE-LISSIE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
MIOCENE - DISPOSAL	Yes	3545.0	3545.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6542.0	6542.0	Yes	LOGGED, PERFORATIONS IN THE LOWER FRIO SAND FROM 7,441'-8,084'
MARINULINA - DISPOSAL	Yes	6136.1	6136.0	Yes	LOGGED
HETEROSTEGINA - DISPOSAL	Yes	6231.0	6290.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS PERFORATED AND SHUT IN. THIS WELL HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

CASING RECORD :

NONE.

TUBING RECORD:

PRODUCING/INJECTION/DISPOSAL INTERVAL :

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION

Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	02/11/2025

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: Exxon Mobil low Carbon Solutions	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson	
Well No.: 1	API No.: 42-245-32913	Drilling Permit No.: 898448
Lease Name: Labelle Properties LTD	Lease No.:	
Field Name: Wildcat	Field No.:	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☒ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 17 1/2"	Depth of drilled hole (ft.): 2,213	Est. % wash-out or hole enlargement: 20
Size of casing in O.D. (in.): 13 3/8"	Casing weight (lbs/ft) and grade: 68# J55	No. of centralizers used: 18
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☒ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 2,203	Top of liner (ft.):
		Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): Surface	Cementing date: 6/25/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	785	XA	SEE REMARKS	1848	1486
2	419	H	SEE REMARKS	534	716
3					
Total	1204			2382	2202

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXON, LABELLE PROPERTIES, LABELLE PROPERTIES LTC #1
SLURRY 1: ECONO CEM
SKLURRY 2: HAL CEM

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

DAVID NGUYEN, SERVICE SUPERVISOR	Halliburton	Daniel Nguyen	
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	6/25/24
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James Harvey	ops. supervisor		
Typed or printed name of operator's representative	Title	Signature	
22777 Springwoods Village	Spring TX 77389	512-949-8272	6/25/24
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	**Operator P-5 No.:**
Cementer Name: DOC ENERGY SERVICES INC	**Cementer P-5 No.:** 221887

WELL INFORMATION

District No.: 3	**County:** JEFFERSON	
Well No.: 1	**API No.:** 42-245-32913	**Drilling Permit No.:** 898448
Lease Name: LABELLE PROPERTIES LTD	**Lease No.:**	
Field Name: Wildcat	**Field No.:**	

I. CASING CEMENTING DATA

Type of casing: ☑ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 26	**Depth of drilled hole (ft.):** 110	**Est. % wash-out or hole enlargement:** 35
Size of casing in O.D. (in.): 20	**Casing weight (lbs/ft) and grade:** 78.6 ppf X-52 (Welded)	**No. of centralizers used:**
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	**Setting depth shoe (ft.):** 110	**Top of liner (ft.):** / **Setting depth liner (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):** 0	**Cementing date:** 6/14/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	225	A	4% GELL & 2% CACL2	349	167
2					
3					
Total	225			349	167

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	**Depth of drilled hole (ft.):**	**Est. % wash-out or hole enlargement:**
Size of casing in O.D. (in.):	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Tapered string drilled hole size (in.) Upper: Lower:	**Tapered string depth of drilled hole (ft.)** Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	**Tapered string casing weight(lbs/ft) and grade** Upper: Lower:	**Tapered string no. of centralizers used** Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		**Setting depth shoe (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:**

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	**Depth of drilled hole (ft.):**	**Est. % wash-out or hole enlargement:**
Size of casing in O.D. (in.):	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Tapered string drilled hole size (in.) Upper: Lower:	**Tapered string depth of drilled hole (ft.)** Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	**Tapered string casing weight(lbs/ft) and grade** Upper: Lower:	**Tapered string no. of centralizers used** Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		**Setting depth tool (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:**

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

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JERRY T MOON JR	DOC ENERGY SERVICES INC		
Name and title of cementer's representative	Cementing Company	Signature	
P.O.BOX 580	OIL CITY, LA 71061	318-995-7126	6/19/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

MICHAEL MATHIS, EXXONMOBIL	WELL OPS SUPERVISOR				
Typed or printed name of operator's representative	Title			Signature	
22777 Springwoods Village	Spring	TX	77389	512-949-8272	06/25/2024
Address	City,	State,	Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

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D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: Exxon Mobil Low Carbon Solution		Operator P-5 No.: 101256	
Cementer Name: Halliburton		Cementer P-5 No.: 347151	

WELL INFORMATION

District No.: 03		County: Jefferson	
Well No.: 1		API No.: 42-245-32913	Drilling Permit No.: 898448
Lease Name: Labelle Properties LTD		Lease No.:	
Field Name: Wildcat		Field No.:	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☑ Production

Drilled hole size (in.): 12.25"	Depth of drilled hole (ft.): 8,672'	Est. % wash-out or hole enlargement: 25%	
Size of casing in O.D. (in.): 9 5/8"	Casing weight (lbs/ft) and grade: 47/53.50 L80/CR13/CR25	No. of centralizers used: 150	
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 8,654'	Top of liner (ft.):	
		Setting depth liner (ft.):	
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date: 7/11/2024	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	775	H	SEE RAMARKS	1395	4012
2	1260	H	SEE REMARKS	2434.32	6301
3					
Total	2035			3829.32	10313

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
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CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

909436927,EXXONMOBIL LOW CARBON-EBUS,LABELLE PROPERTIES LTD,1,PRODUCTION:
SLURRY 1:CorossaCem , SLURRY 2:CorossaLock

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ZOUHIR ROUBACHE	Halliburton			
Name and title of cementer's representative	Cementing Company	Signature		
4720 Industrial	Bossier City, LA 71112	903-986-5096		7/11/2024
Address	City, State, Zip Code	Tel: Area Code	Number	Date: mo. day yr.

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James Harvey	Drlg. OPS. Supervisor			
Typed or printed name of operator's representative	Title	Signature		
22777 Spring Woods Village	Spring Tx 77389	512-949-8272		7/13/24
Address	City, State, Zip Code	Tel: Area Code	Number	Date: mo. day yr.

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D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON | Sperry Drilling

DGR / EWR-P4 / DIR

Powered by INSITE™

1 : 500

MD Phase Attenuation Log

Country : USA
Field : WILDCAT
Location : Lat: 29° 59' 58.84" North Long: 94° 17' 6.39" West
Well : LABELLE PROPERTIES LTD 1
Company : EXXONMOBIL LOW C SOL ON STOR LL
Rig : NABORS X33

Company	: EXXONMOBIL LOW C SOL ON STOR LL
Rig	: NABORS X33
Well	: LABELLE PROPERTIES LTD 1
Field	: WILDCAT
Country	: USA
API Number	: 4224532913

LOCATION

Latitude : 29° 59' 58.84" North
Longitude : 94° 17' 6.39" West

StatePlane X = 3,460,521.210 usft
StatePlane Y = 13,941,119.320 usft

Other Services

Permanent Datum : Ground Level
Elevation : 26.60 ft
Log Measured From : Drill Floor
32.52 ft Above Permanent Datum
Drilling Measured From : Drill Floor

MD LOG

Elev. KB
DF 59.12 ft
GL 26.60 ft
WD

Depth Logged : 142.00 ft To 8,672.00 ft
Date Logged : 23-Jun-24 To 01-Jul-24
Total Depth MD : 8,672.00 ft TVD : 8,671.78 ft
Spud Date : 22-Jun-24

Unit No. :
Job No. :LF-XX-0909034765
Plot Type : Final
Plot Date : 24-Jul-24

Run No.	Borehole Record (MD)			Size	Casing Record (MD)		
	Size	From	To		Weight	From	To
100	17.500 in	142.00 ft	2,213.00 ft	20.000 in	94.00 lbpf	SURFACE	142.00 ft
200	12.250 in	2,213.00 ft	3,565.00 ft	13.375 in	68.00 lbpf	SURFACE	2,203.00 ft
201	12.250 in	3,565.00 ft	3,626.00 ft				
300	12.250 in	3,626.00 ft	7,481.00 ft				
301	12.250 in	7,481.00 ft	7,541.00 ft				
400	12.250 in	7,541.00 ft	8,672.00 ft				

WELL INFORMATION

MWD Run Number	100	200	300	400	
Date run completed	24-Jun-24	27-Jun-24	30-Jun-24	02-Jul-24	
Rig Bit Number	100	200	300	400	
Bit Size (in)	17.500	12.250	12.250	12.250	
Tool Nominal OD (in)	8.000	8.000	8.000	8.000	
Log Start Depth (MD, ft)	142.00	2,213.00	3,626.00	7,541.00	
Log End Depth (MD, ft)	2,213.00	3,565.00	7,481.00	8,672.00	
Drill or Wipe	Drill	Drill	Drill	Drill	
Drill/Wipe Start Date and Time	23-Jun-24 06:20	26-Jun-24 09:22	28-Jun-24 15:15	01-Jul-24 11:30	
Drill/Wipe End Date and Time	23-Jun-24 23:50	27-Jun-24 03:09	29-Jun-24 16:43	01-Jul-24 19:05	
Min Inc (deg) @ Depth (MD, ft)	0.06 @ 584.00	0.06 @ 3,400.00	0.00 @ 4,345.00	0.19 @ 8,031.00	
Max Inc (deg) @ Depth (MD, ft)	1.13 @ 1,237.00	0.67 @ 2,455.00	0.86 @ 7,189.00	0.57 @ 7,464.00	
Bit TFA(in2) / Bit Type	1.23 / GT65s	0.91 / HD65s	0.91 / HD65s	0.91 / HD65s	
Flow Rate (gpm)	700.00	650.00	650.00	750.00	
Max AV (fpm) / CV (fpm) @ MWD	84.0 / 260.0	105.9 / 105.9	182.0 / 358.0	213.0 / 540.0	
Fluid Type	Native/Spud Mud	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base	
Density (ppg) / Viscosity (spqt)	8.60 / 31.00	9.80 / 65.00	9.90 / 58.00	10.20 / 56.00	
Filtrate CL (ppm)	1,100.00	44,000.00	49,000.00	66,000.00	
pH / API Filtrate (mptm)	8.30 / 9	N/A / 7	N/A / 7	N/A / 3	
PV (cP) / YP (lhf2)	2 / 4.00	17 / 12.00	19 / 11.00	25 / 18.00	
% Solids / % Sand	4.9 / .01	9.1 / N/A	9.7 / N/A	9.8 / 0.01	
% Oil / Oil:Water Ratio	0 / 0:100	53.5 / 63:37	59 / 67:33	58 / 65:35	
Rm @ Measured Temp (degF)	0.100 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Rmf @ Measured Temp (degF)	0.100 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Rmc @ Measured Temp (degF)	0.100 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Max Tool Temp (degF) / Source	113.18 / HCIM	141.41 / HCIM	158.00 / PCDC	176.00 / PCDC	
Rm @ Max Tool Temp (degF)	0.0673 @ 113.18	N/A @ 141.41	N/A @ 158.00	N/A @ 176.00	
Lead MWD Engineer	Thomas Shea	Thomas Shea	Thomas Shea	Thomas Shea	
Customer Representative	James Harvey	Mike Mathis	Mike Mathis	Mike Mathis	

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM	HCIM	HCIM	
Software Version	98.43	98.43	98.43	98.43	
Sub Serial Number	11700362	11700362	11700362	11700362	
Insert Serial Number	11618726	11618726	11618726	11618726	
Date and Time Initialized	22-Jun-24 15:49	26-Jun-24 06:33	28-Jun-24 12:13	01-Jul-24 07:11	
Date and Time Read	23-Jun-24 19:41	27-Jun-24 09:17	30-Jun-24 01:03	02-Jul-24 10:40	
ECMB SW Version	N/A	N/A	N/A	N/A	

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	39.96	70.27	70.27	70.29	
Software Version	6.43	6.43	6.43	6.43	
Sub Serial Number	10436639	10436639	10436639	10436639	
Sonde Serial Number	11902174	11902174	11902174	11902174	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	0.00	230.30	230.30	230.30	

Gamma Ray Sensor Information

Tool Type	DGR	DGR	DGR	DGR	
Distance From Bit (ft)	24.09	59.50	59.50	59.49	
Recorded Sample Period (sec)	4	4	4	4	
Software Version	N/A	N/A	N/A	N/A	
Sub Serial Number	11618726	11618726	1161826	1161826	
Insert/Sonde Serial Number	11700362	11700362	11700362	11700362	

Resistivity Sensor Information

Tool Type	EWR-P4				
Distance From Bit (ft)	10.09				
Recorded Sample Period (sec)	4				
Software Version	1.51				
Sub Serial Number	11973885				
Receiver Insert Serial Number	11281932				
Transmitter Insert Serial Number	11193458				
Receiver Orientation	Down				

REMARKS

All depths are referenced to the driller's pipe tally.

DGXT - Gamma Ray formation exposure time
EWXT - Resistivity formation exposure time

Default 1:500 Log Smoothing:
Interval Resolution: 0.5ft
Window Interval:(+/-) 0.6ft
Gap Fill: 3.0ft

Archive Name: LABELLE_PROPERTIES_LTD_1_500MD_PHASE_ATTEN_142_8672

Plot Width: 8.25 in

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division
Tracking No.: 326094

ELECTRIC LOG STATUS REPORT

This facsimile L-1 was generated electronically from data submitted to the RRC.

FORM L-1

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 10/03/2024
Field Name WILDCAT	Drilling Permit No. 898448	
Lease Name LABELLE PROPERTIES LTD	Lease/ID No. 28199	Well No. 1
County JEFFERSON	API No. 42- 245-32913	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

Lease or ID No(s). _____

Well No(s). _____

Josh Calkin
Signature

Title

EXXONMOBIL LOW C SOL ON STOR LLC
Name (print)

(281) 702-5537
Phone

12/19/2024
Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Kristen Killen,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **June 23, 2024 to July 1, 2024** conduct or supervise the taking of Directional Surveys as follow:

- **396' to a depth of 8604' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8672'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **LABELLE PROPERTIES LTD 1** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Kristen Killen, Log Analyst

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON
4607 HWY 90 EAST • BROUSSARD, LA 70518
PHONE 337 837 3061 • FAX 337 837 4400

July 24, 2024

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
LABELLE PROPERTIES LTD 1
Permit No. 898448
Jefferson County, TX
API # 42-245-32913

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Kristen Killen, Log Analyst
Drainhole Number	-	Original
Surveyed Depths	-	396' – 8604' MWD Surveys performed by Sperry Drilling
Dates Performed	-	June 23, 2024 to July 1, 2024
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,

Kristen Killen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 909034765

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx_NAD83
Rose Prospect CCS
Labelle Properties LTD #1
42245332913
001 ST00BP00

Design: 001 ST00BP00

Sperry Drilling Services

Geodetic Report

19 July, 2024

Well Coordinates: 13,941,119.32 N, 3,460,521.21 E (29° 59' 58.84" N, 094° 17' 06.39" W)
Ground Level: 26.60 usft

Local Coordinate Origin:	Centered on Well Labelle Properties LTD #1
Viewing Datum:	(32.52') Nabors X-33 @ 59.12usft (Before Spud)
TVDs to System:	N
North Reference:	Grid
Unit System:	API US Survey Feet

Version: 5000.17 Build: 02

HALLIBURTON

Design Report for Labelle Properties LTD #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	29° 59' 58.843 N	94° 17' 6.388 W	13,941,119.32	3,460,521.21
396.00	0.31	302.42	396.00	0.57	-0.90	29° 59' 58.849 N	94° 17' 6.398 W	13,941,119.89	3,460,520.31
491.00	0.33	316.43	491.00	0.91	-1.31	29° 59' 58.852 N	94° 17' 6.403 W	13,941,120.23	3,460,519.90
584.00	0.06	160.13	584.00	1.06	-1.48	29° 59' 58.854 N	94° 17' 6.405 W	13,941,120.38	3,460,519.73
679.00	0.31	105.12	679.00	0.94	-1.21	29° 59' 58.853 N	94° 17' 6.402 W	13,941,120.26	3,460,520.00
765.00	0.25	190.83	764.99	0.70	-1.02	29° 59' 58.850 N	94° 17' 6.400 W	13,941,120.02	3,460,520.19
862.00	0.28	223.68	861.99	0.32	-1.23	29° 59' 58.846 N	94° 17' 6.402 W	13,941,119.64	3,460,519.98
956.00	0.19	251.73	955.99	0.11	-1.53	29° 59' 58.844 N	94° 17' 6.406 W	13,941,119.43	3,460,519.68
1,043.00	0.59	311.75	1,042.99	0.36	-2.00	29° 59' 58.847 N	94° 17' 6.411 W	13,941,119.68	3,460,519.21
1,139.00	0.65	324.96	1,138.99	1.13	-2.69	29° 59' 58.855 N	94° 17' 6.418 W	13,941,120.45	3,460,518.52
1,237.00	1.13	346.55	1,236.97	2.53	-3.23	29° 59' 58.869 N	94° 17' 6.424 W	13,941,121.85	3,460,517.98
1,334.00	1.02	341.03	1,333.96	4.28	-3.73	29° 59' 58.887 N	94° 17' 6.429 W	13,941,123.60	3,460,517.48
1,423.00	0.84	310.12	1,422.95	5.44	-4.49	29° 59' 58.898 N	94° 17' 6.437 W	13,941,124.76	3,460,516.72
1,519.00	0.61	306.92	1,518.94	6.21	-5.44	29° 59' 58.906 N	94° 17' 6.447 W	13,941,125.53	3,460,515.77
1,612.00	0.33	217.44	1,611.94	6.29	-5.99	29° 59' 58.907 N	94° 17' 6.454 W	13,941,125.61	3,460,515.22
1,707.00	0.42	215.22	1,706.93	5.79	-6.36	29° 59' 58.903 N	94° 17' 6.458 W	13,941,125.11	3,460,514.85
1,804.00	0.43	218.07	1,803.93	5.21	-6.79	29° 59' 58.897 N	94° 17' 6.463 W	13,941,124.53	3,460,514.42
1,894.00	0.89	271.47	1,893.93	4.96	-7.70	29° 59' 58.895 N	94° 17' 6.474 W	13,941,124.28	3,460,513.51
1,991.00	0.70	257.71	1,990.92	4.86	-9.03	29° 59' 58.894 N	94° 17' 6.489 W	13,941,124.18	3,460,512.18
2,088.00	0.31	300.25	2,087.91	4.86	-9.84	29° 59' 58.895 N	94° 17' 6.498 W	13,941,124.18	3,460,511.37
2,171.00	0.26	350.35	2,170.91	5.16	-10.06	29° 59' 58.898 N	94° 17' 6.500 W	13,941,124.48	3,460,511.15
2,267.00	0.57	26.56	2,266.91	5.80	-9.88	29° 59' 58.904 N	94° 17' 6.498 W	13,941,125.12	3,460,511.33
2,363.00	0.63	17.23	2,362.90	6.73	-9.51	29° 59' 58.913 N	94° 17' 6.494 W	13,941,126.05	3,460,511.70
2,455.00	0.67	26.51	2,454.90	7.70	-9.12	29° 59' 58.923 N	94° 17' 6.489 W	13,941,127.02	3,460,512.09
2,549.00	0.58	25.23	2,548.89	8.62	-8.68	29° 59' 58.932 N	94° 17' 6.483 W	13,941,127.94	3,460,512.53
2,645.00	0.42	12.95	2,644.89	9.40	-8.39	29° 59' 58.939 N	94° 17' 6.480 W	13,941,128.72	3,460,512.82
2,742.00	0.25	14.60	2,741.89	9.95	-8.26	29° 59' 58.945 N	94° 17' 6.478 W	13,941,129.27	3,460,512.95
2,832.00	0.32	347.80	2,831.89	10.39	-8.26	29° 59' 58.949 N	94° 17' 6.478 W	13,941,129.71	3,460,512.95
2,929.00	0.18	359.49	2,928.88	10.81	-8.32	29° 59' 58.953 N	94° 17' 6.478 W	13,941,130.13	3,460,512.89
3,025.00	0.09	307.84	3,024.88	11.00	-8.38	29° 59' 58.955 N	94° 17' 6.479 W	13,941,130.32	3,460,512.83
3,121.00	0.09	276.88	3,120.88	11.06	-8.52	29° 59' 58.956 N	94° 17' 6.480 W	13,941,130.38	3,460,512.69
3,214.00	0.13	264.11	3,213.88	11.06	-8.69	29° 59' 58.956 N	94° 17' 6.482 W	13,941,130.38	3,460,512.52
3,309.00	0.09	161.81	3,308.88	10.98	-8.78	29° 59' 58.955 N	94° 17' 6.483 W	13,941,130.30	3,460,512.43
3,400.00	0.06	225.09	3,399.88	10.87	-8.79	29° 59' 58.954 N	94° 17' 6.483 W	13,941,130.19	3,460,512.42
3,496.00	0.25	142.62	3,495.88	10.67	-8.70	29° 59' 58.952 N	94° 17' 6.482 W	13,941,129.99	3,460,512.51
3,507.17	0.25	145.70	3,507.05	10.63	-8.67	29° 59' 58.951 N	94° 17' 6.482 W	13,941,129.95	3,460,512.54
3,686.00	0.28	195.98	3,685.88	9.90	-8.57	29° 59' 58.944 N	94° 17' 6.481 W	13,941,129.22	3,460,512.64
3,782.00	0.18	201.29	3,781.88	9.53	-8.69	29° 59' 58.941 N	94° 17' 6.483 W	13,941,128.85	3,460,512.52
3,876.00	0.06	170.16	3,875.88	9.34	-8.74	29° 59' 58.939 N	94° 17' 6.483 W	13,941,128.66	3,460,512.47
3,967.00	0.22	345.14	3,966.88	9.47	-8.77	29° 59' 58.940 N	94° 17' 6.484 W	13,941,128.79	3,460,512.44
4,065.00	0.25	12.46	4,064.88	9.86	-8.78	29° 59' 58.944 N	94° 17' 6.484 W	13,941,129.18	3,460,512.43
4,161.00	0.14	3.58	4,160.88	10.18	-8.72	29° 59' 58.947 N	94° 17' 6.483 W	13,941,129.50	3,460,512.49

Design Report for Labelle Properties LTD #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
4,250.00	0.14	10.43	4,249.88	10.39	-8.70	29° 59' 58.949 N	94° 17' 6.483 W	13,941,129.71	3,460,512.51
4,345.00	0.00	91.76	4,344.88	10.51	-8.68	29° 59' 58.950 N	94° 17' 6.482 W	13,941,129.83	3,460,512.53
4,442.00	0.13	284.23	4,441.88	10.54	-8.78	29° 59' 58.951 N	94° 17' 6.483 W	13,941,129.86	3,460,512.43
4,539.00	0.28	249.99	4,538.88	10.48	-9.11	29° 59' 58.950 N	94° 17' 6.487 W	13,941,129.80	3,460,512.10
4,630.00	0.13	167.76	4,629.88	10.30	-9.30	29° 59' 58.948 N	94° 17' 6.489 W	13,941,129.62	3,460,511.91
4,725.00	0.19	159.33	4,724.88	10.05	-9.22	29° 59' 58.946 N	94° 17' 6.489 W	13,941,129.37	3,460,511.99
4,817.00	0.42	147.25	4,816.88	9.63	-8.98	29° 59' 58.942 N	94° 17' 6.486 W	13,941,128.95	3,460,512.23
4,911.00	0.25	157.32	4,910.87	9.15	-8.72	29° 59' 58.937 N	94° 17' 6.483 W	13,941,128.47	3,460,512.49
5,008.00	0.35	153.99	5,007.87	8.68	-8.51	29° 59' 58.932 N	94° 17' 6.481 W	13,941,128.00	3,460,512.70
5,099.00	0.26	82.39	5,098.87	8.46	-8.18	29° 59' 58.930 N	94° 17' 6.478 W	13,941,127.78	3,460,513.03
5,195.00	0.18	52.96	5,194.87	8.58	-7.84	29° 59' 58.931 N	94° 17' 6.474 W	13,941,127.90	3,460,513.37
5,292.00	0.42	34.84	5,291.87	8.97	-7.52	29° 59' 58.934 N	94° 17' 6.470 W	13,941,128.29	3,460,513.69
5,388.00	0.31	24.73	5,387.87	9.49	-7.21	29° 59' 58.940 N	94° 17' 6.466 W	13,941,128.81	3,460,514.00
5,482.00	0.42	342.12	5,481.87	10.05	-7.21	29° 59' 58.945 N	94° 17' 6.466 W	13,941,129.37	3,460,514.00
5,574.00	0.36	329.02	5,573.86	10.62	-7.46	29° 59' 58.951 N	94° 17' 6.468 W	13,941,129.94	3,460,513.75
5,670.00	0.53	314.29	5,669.86	11.19	-7.94	29° 59' 58.957 N	94° 17' 6.474 W	13,941,130.51	3,460,513.27
5,767.00	0.50	313.01	5,766.86	11.79	-8.57	29° 59' 58.963 N	94° 17' 6.480 W	13,941,131.11	3,460,512.64
5,858.00	0.25	295.28	5,857.86	12.14	-9.04	29° 59' 58.967 N	94° 17' 6.486 W	13,941,131.46	3,460,512.17
5,955.00	0.18	274.92	5,954.85	12.25	-9.38	29° 59' 58.968 N	94° 17' 6.489 W	13,941,131.57	3,460,511.83
6,052.00	0.25	226.53	6,051.85	12.12	-9.68	29° 59' 58.967 N	94° 17' 6.493 W	13,941,131.44	3,460,511.53
6,238.00	0.40	184.93	6,237.85	11.19	-10.03	29° 59' 58.957 N	94° 17' 6.497 W	13,941,130.51	3,460,511.18
6,428.00	0.43	142.07	6,427.85	9.97	-9.65	29° 59' 58.945 N	94° 17' 6.494 W	13,941,129.29	3,460,511.56
6,522.00	0.31	101.91	6,521.85	9.64	-9.19	29° 59' 58.942 N	94° 17' 6.488 W	13,941,128.96	3,460,512.02
6,638.00	0.35	51.62	6,637.84	9.79	-8.60	29° 59' 58.943 N	94° 17' 6.482 W	13,941,129.11	3,460,512.61
6,706.00	0.36	33.75	6,705.84	10.10	-8.32	29° 59' 58.946 N	94° 17' 6.478 W	13,941,129.42	3,460,512.89
6,803.00	0.36	13.29	6,802.84	10.65	-8.08	29° 59' 58.951 N	94° 17' 6.475 W	13,941,129.97	3,460,513.13
6,897.00	0.43	358.50	6,896.84	11.29	-8.02	29° 59' 58.958 N	94° 17' 6.474 W	13,941,130.61	3,460,513.19
6,994.00	0.44	344.45	6,993.84	12.01	-8.13	29° 59' 58.965 N	94° 17' 6.475 W	13,941,131.33	3,460,513.08
7,189.00	0.86	346.17	7,188.82	14.15	-8.68	29° 59' 58.986 N	94° 17' 6.481 W	13,941,133.47	3,460,512.53
7,284.00	0.84	340.34	7,283.81	15.50	-9.09	29° 59' 59.000 N	94° 17' 6.485 W	13,941,134.82	3,460,512.12
7,381.00	0.67	318.96	7,380.80	16.60	-9.70	29° 59' 59.011 N	94° 17' 6.491 W	13,941,135.92	3,460,511.51
7,409.00	0.45	321.74	7,408.80	16.81	-9.87	29° 59' 59.013 N	94° 17' 6.493 W	13,941,136.13	3,460,511.34
7,464.00	0.57	329.25	7,463.80	17.21	-10.15	29° 59' 59.017 N	94° 17' 6.496 W	13,941,136.53	3,460,511.06
7,653.00	0.43	306.59	7,652.79	18.44	-11.20	29° 59' 59.030 N	94° 17' 6.507 W	13,941,137.76	3,460,510.01
7,749.00	0.39	272.61	7,748.79	18.67	-11.81	29° 59' 59.032 N	94° 17' 6.514 W	13,941,137.99	3,460,509.40
7,941.00	0.31	214.26	7,940.79	18.27	-12.76	29° 59' 59.029 N	94° 17' 6.525 W	13,941,137.59	3,460,508.45
8,031.00	0.19	194.93	8,030.79	17.93	-12.93	29° 59' 59.025 N	94° 17' 6.527 W	13,941,137.25	3,460,508.28
8,123.00	0.25	138.03	8,122.79	17.63	-12.84	29° 59' 59.022 N	94° 17' 6.526 W	13,941,136.95	3,460,508.37
8,220.00	0.25	146.32	8,219.79	17.30	-12.58	29° 59' 59.019 N	94° 17' 6.524 W	13,941,136.62	3,460,508.63
8,314.00	0.36	131.85	8,313.78	16.93	-12.25	29° 59' 59.015 N	94° 17' 6.520 W	13,941,136.25	3,460,508.96
8,407.00	0.26	84.39	8,406.78	16.76	-11.82	29° 59' 59.013 N	94° 17' 6.515 W	13,941,136.08	3,460,509.39
8,501.00	0.38	54.36	8,500.78	16.96	-11.35	29° 59' 59.015 N	94° 17' 6.510 W	13,941,136.28	3,460,509.86

Design Report for Labelle Properties LTD #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
8,604.00	0.32	61.67	8,603.78	17.29	-10.82	29° 59' 59.018 N	94° 17' 6.504 W	13,941,136.61	3,460,510.39
8,672.00	0.32	61.67	8,671.78	17.47	-10.49	29° 59' 59.020 N	94° 17' 6.500 W	13,941,136.79	3,460,510.72

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,672.00	8,671.78	17.47	-10.49	Proj. to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
396.00	2,171.00	01 HAL MWD (MagVarMS) 17 1/2" Hole 396' - 2171'	3_MWD+HRGM+MS
2,267.00	8,604.00	02 HAL MWD (MagVarMS) 12 1/4" Hole 2267' - XX'	3_MWD+HRGM+MS

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
150.00	150.00	20" Conductor Casing	20	20

Design Report for Labelle Properties LTD #1 - 001 ST00BP00

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated

Directional Difficulty Index

Average Dogleg over Survey:	0.20 °/100usft	Maximum Dogleg over Survey:	0.80 °/100usft at 1,894.00 usft
Net Tortousity applicable to Plans:	0.20 °/100usft	Directional Difficulty Index:	2.984

Audit Info

North Reference Sheet for Rose Prospect CCS - Labelle Properties LTD #1 - 001 ST00BP00

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 59.12usft (Before Spud). Northing and Easting are relative to Labelle Properties LTD #1

Coordinate System is US State Plane 1983, Texas South Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 1,968,500.00usft, False Northing: 13,123,333.33usft, Scale Reduction: 0.99993037

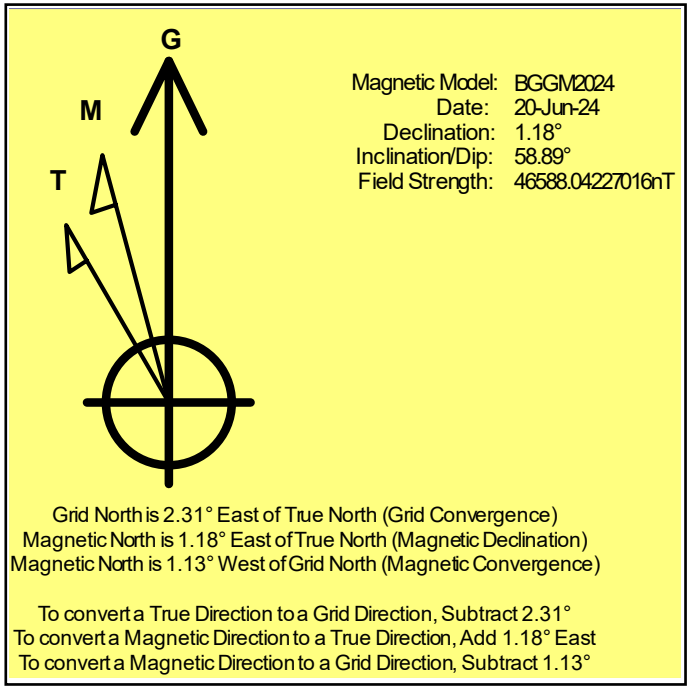
Grid Coordinates of Well: 13,941,119.32 usft N, 3,460,521.21 usft E

Geographical Coordinates of Well: 29° 59' 58.84" N, 094° 17' 06.39" W

Grid Convergence at Surface is: 2.31°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,672.00usft

the Bottom Hole Displacement is 20.38usft in the Direction of 329.02° (Grid).
Magnetic Convergence at surface is: 1.13° (20 June 2024, , BGGM2024)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898448	Apr 05, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32913	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	569.27

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
LABELLE PROPERTIES LTD	1
LOCATION	**TOTAL DEPTH**
4.5 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 42 BLOCK ABSTRACT 874

SURVEY T&NO RR CO/STARK, W L

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
371 ft. NORTH 2016 ft. WEST	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
371 ft. NORTH 2016 ft. WEST	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	569.27	8,700	1	03
LABELLE PROPERTIES LTD			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

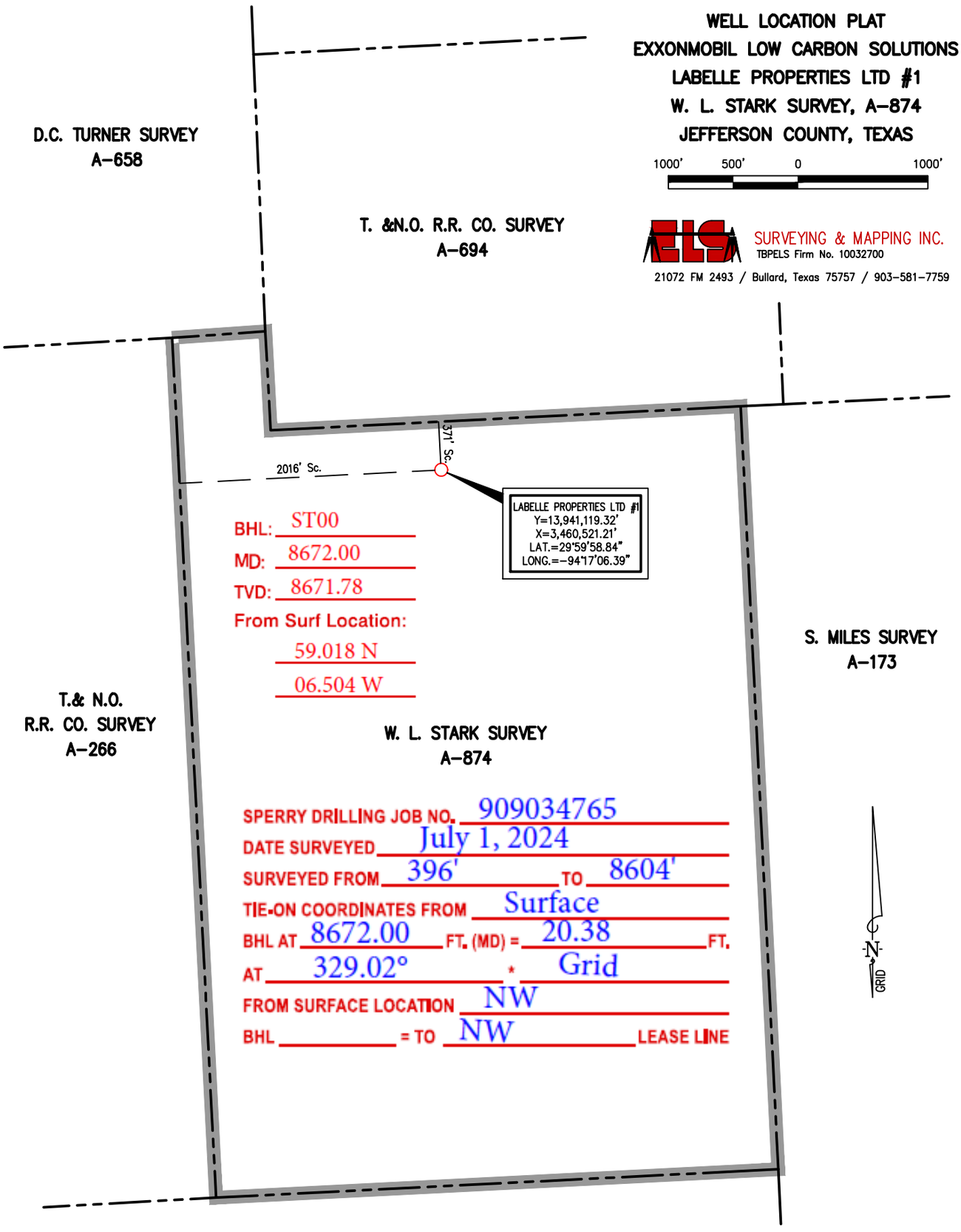
The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
LABELLE PROPERTIES LTD #1
W. L. STARK SURVEY, A-874
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759



SHL	TRACT CALLS	SURVEY CALLS	ELEV.
LABELLE PROPERTIES LTD #1	371' Sc. FNL 2016' Sc. FWL	371' Sc. FNL 2016' Sc. FWL	22.9'

Location is approximately
10.4 miles SW of Beaumont, Tx.
"FANNETT WEST" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 1.9 miles turn left (South). Drive on location.

DATE SURVEYED: 8/23/2023-8/28/2023

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data and tract acreages shown hereon were furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

STATE OF TEXAS REGISTERED
JIM G. GLASS
5262
PROFESSIONAL LAND SURVEYOR

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS - - - COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: April 2, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: ECJ | FB 2744/88-97 | Job No. 430923 | Map No. J-0923-LOC-INJ1B

CONFIDENTIAL BUSINESS INFORMATION

CHRISTI CRADDICK, CHAIRMAN
WAYNE CHRISTIAN, COMMISSIONER
JIM WRIGHT, COMMISSIONER

DANNY SORRELLS
DIRECTOR, OIL AND GAS DIVISION
PETER FISHER, P.G.
DISTRICT DIRECTOR

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

OPERATOR Name:	EXXONMOBIL LOW C SOL ON	**RE:**	**Lease:**	LaBelle Properties, Ltd
Address1:	ATTN EDWARD E GRAHAM W1.2B.02			
Address2:	22777 SPRINGWOODS VILLAGE PKWY	**Well No:**	1	
City:	SPRING	**Sec:**	42	**Block:**
State:	TX	**County:**	JEFFERSON	
		Survey Name:	Stark, W. L.	

SWR13EX Application Number: 130360 **Drilling Permit No:**

SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for **LEASE** LaBelle Properties, Ltd ; **WELL** 1 has been approved by the Railroad Commission of Texas District Office.

a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.

b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.

c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.

d. The casing and cement program shall adhere to the following specifications:

Set 2230 feet of surface casing and circulate cement from the shoe to the ground surface.

DP 898448 - Exxonmobil, Labelle Properties Ltd Lease Well 1 (245 32913)

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted 05/20/2024 .
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: AUDREY KUKLENZ DATE: 05/20/2024

PETER FISHER, P.G.

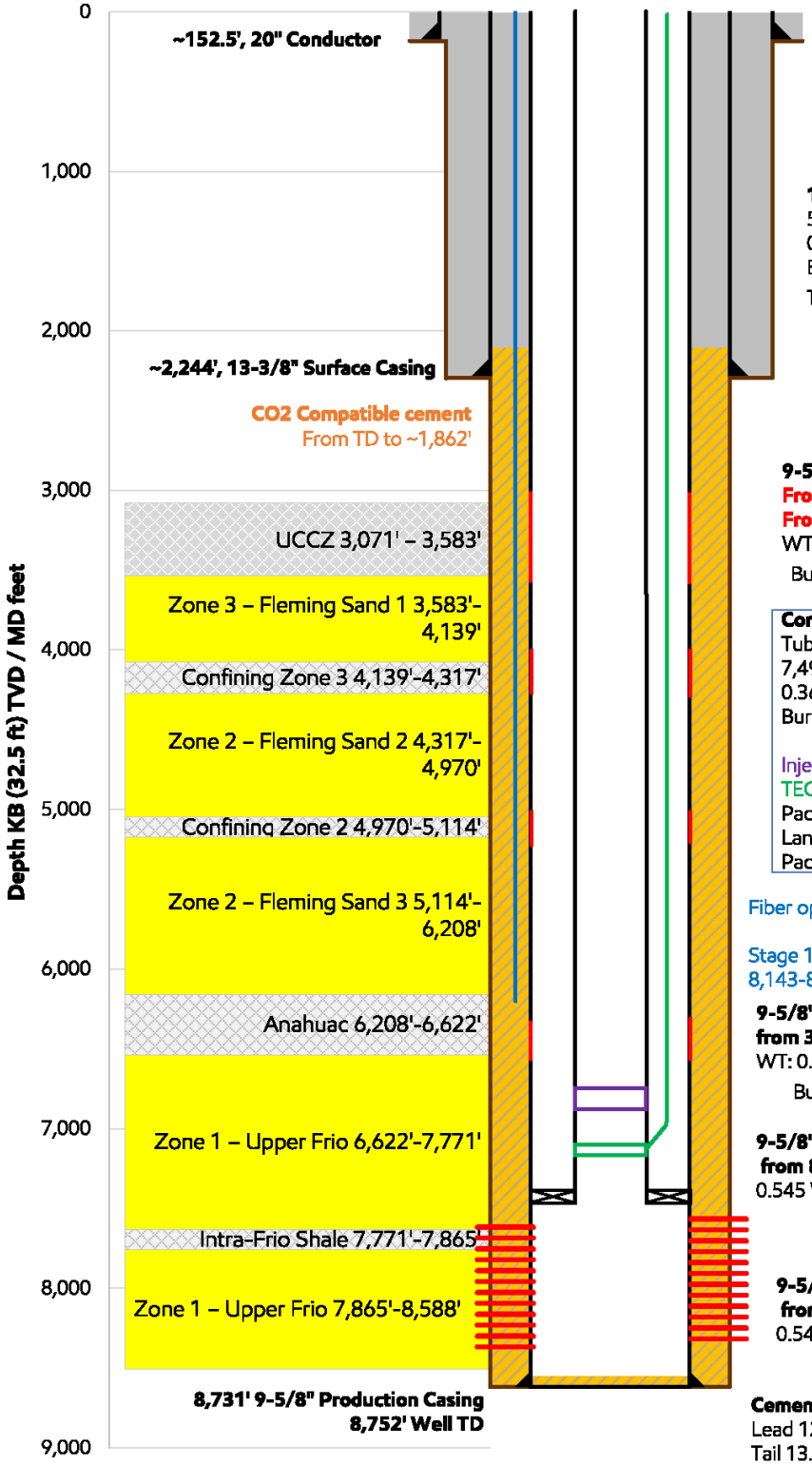
DISTRICT DIRECTOR

CONFIDENTIAL BUSINESS INFORMATION

4224532911 Bead Farm Co. 2 (Rose CCS Project Injection Well No. 02)

CONFIDENTIAL BUSINESS INFORMATION

Rose CCS Project Bead Farm Co 2
Completion Wellbore Schematic



20" Conductor
78.6 ppf, X-52, Welded
0.375" WT, 19.25" ID
Burst: 1,950, Collapse: 320 psi, Tensile: 1,202 kips

13-3/8" Surface casing
54.5 ppf, J-55, BTC
0.380" WT, 12.615" ID, 12.459" Drift
Burst: 2,740 psi, Collapse: 1,130 psi, Tensile: 853 kips
TOC @ Surface

9-5/8", 47 ppf, L80, DWC/C-SR, from surface to 3,049' TVDdf
0.472 WT, 8.681" ID, 8.525 Drift
Burst: 6,870 psi, Collapse: 4,760 psi, 1,086 kips

9-5/8", 53.5 ppf, SM25Cr-125, VAM 21
From 3,049' – 3,597 (548'), 4,129'- 4,347' (218')
From 4,966' – 5,147' (181'), 6,428' – 6,647' (219')
WT: 0.545" 8.535" ID, 8.5" drift
Burst: 12,740 psi, Collapse: 8,440 psi, Tensile: 1,943 kips

Completions:
Tubing – 7", 26 ppf, L80-13Cr, VAM21, from surface to 7,491'
0.362" WT, 6.276" ID, 6.151" Drift
Burst: 7,240, Collapse: 5,410, Tensile: 604 kips

Injection safety valve ~7,456'
TEC P&T gauge ~7,481'
Packer ~7,491'
Landing nipple ~7,513' min ID 4.437"
Packer Fluid – 7 ppg Diesel

Fiber optic line from surface to ~6,184'

Stage 1 perf interval: 7,540'-7,769'; 7,962'-8,026'; 8,107'-8,124'; 8,143-8,160'

9-5/8", 47 ppf, 13Cr-80, JFE Lion,
from 3,597' to 8,092' TVDdf except where 25CR125 is noted
WT: 0.4472" 8.681" ID, 8.525" drift
Burst: 6,870 psi, Collapse: 4,750 psi, Tensile: 1,086 kips

9-5/8" 53.5 ppf, 13Cr-80, JFE Lion
from 8,092' - 8,610' TVDdf
0.545 WT, 8.535" ID, 8.50" Drift
Burst: 7,930 psi, Collapse: 6,620 psi, 1,244 kips

9-5/8" 53.5 ppf, L-80, JFE Lion
from 8,610' - 8,731' TVDdf (shoe track)
0.545 WT, 8.535" ID, 8.50" Drift
Burst: 7,930 psi, Collapse: 6,620 psi, 1,244 kips

Cement:
Lead 12.5 ppg, from surface to ~1,862'
Tail 13.5 ppg CO2 compatible cement, from ~1,862' to ~8,752'

ERM

Appendix D.1
Completions Wellbore Schematic for Rose CCS Project
Injection Well No. 02
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, TX

CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32911

Drilling Permit # 898449

SWR Exception

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256

2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC

3. Operator Address (include street, city, state, zip): ATTN EDWARD E GRAHAM, 22777 SPRINGWOODS VILLAGE PKWY, SPRING, TX 77389-0000

4. Lease Name: BEAD FARM CO.

5. Well No.: 2

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 10000

9. Do you have the right to develop the minerals under any right-of-way ? [X] Yes [ ] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03

12. County: JEFFERSON

13. Surface Location [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 4.5 miles in a SE direction from China which is the nearest town in the county of the well site.

15. Section: 41

16. Block:

17. Survey: T&NO RR CO

18. Abstract No.: A-266

19. Distance to nearest lease line: ft.

20. Number of contiguous acres in lease, pooled unit, or unitized tract: 470

21. Lease Perpendiculars: 692 ft from the WEST line and 2409 ft from the SOUTH line.

22. Survey Perpendiculars: 1535 ft from the WEST line and 2409 ft from the SOUTH line.

23. Is this a pooled unit? [ ] Yes [X] No

24. Unitization Docket No:

25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION — List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	8800	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks

[RRC STAFF Mar 28, 2024 4:31 PM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 4, 2024 3:00 PM]: Problems identified with this permit are resolved.; [RRC STAFF Apr 4, 2024 3:06 PM]: Changed survey line call from 692' W to 1535' W per plat.; [RRC STAFF Apr 4, 2024 3:07 PM]: Amended plat uploaded.

RRC Use Only Data Validation Time Stamp: Mar 26, 2025 1:51 PM(Current Version)

Certificate:

I certify that information stated in this application is true and complete, to the best of my knowledge.

Josh Calkin — Name of filer

Mar 27, 2024 — Date submitted

(281)702-5537 — Phone

Josh.Calkin@erm.com — E-mail Address (OPTIONAL)

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898449	Apr 04, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32911	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	470

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM CO.	2
LOCATION	**TOTAL DEPTH**
4.5 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 41 BLOCK ABSTRACT 266

SURVEY T&NO RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1535 ft. WEST 2409 ft. SOUTH	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
692 ft. WEST 2409 ft. SOUTH	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	470.00	8,800	2	03
BEAD FARM CO.			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	31 December 2024	**GAU Number:**	389717

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532911
		County:	JEFFERSON
		Lease Name:	Bead Farm Co.
		Lease Number:	
Operator No.:	101256	**Well Number:**	2
		Total Vertical	10000
		Latitude:	29.990801
		Longitude:	-94.297850
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-T&NO RR CO; Abstract-266; Section-41

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Initial Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1,200 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1,450 feet at the site of the referenced well.

*(SIP Purpose Only) Water Code Section 27.046(a) requires the GAU to issue a GW-2 letter containing Non-Endangerment language prior to issuance of a class VI permit. An additional letter will be required before SIP can issue a final permit because this letter is silent on endangerment of fresh water. *

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 12/19/2024. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	11 February 2025	**GAU Number:**	390198

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532911
		County:	JEFFERSON
		Lease Name:	Bead Farm Co.
		Lease Number:	
Operator No.:	101256	**Well Number:**	2
		Total Vertical	10000
		Latitude:	29.990801
		Longitude:	-94.297850
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-T&NO RR CO; Abstract-266; Section-41

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1,200 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1,450 feet at the site of the referenced well.

This recommendation is applicable to an area extent within a radius of 0.8 mile of this location.

The vertical geological isolation from both bases of usable quality water and underground source of drinking water is at 3,200 feet in TVD depth (for UIC Purpose Only).

Injection into the subsurface interval from 3,400 to 8,600 feet in TVD depth, as proposed in the submitted W14 (Class VI) application dated on December 18th of 2024 , WILL NOT ENDANGER the PROTECTED WATER STRATA geologically at the proposed location in this area (for UIC Purpose Only).

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 01/22/2025. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 02/20/2025
Tracking No.: 326169

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-0000

WELL INFORMATION

API 42-245-32911 **County:** JEFFERSON
Well No.: 2 **RRC District** 03
Lease BEAD FARM CO. **Field** WILDCAT
RRC Lease 28125 **Field No.:** 00006001
Location Section: 41, Block: , Survey: T&NO RR CO, Abstract: 266

Latitude 29 **Longitud** -94
This well is 4.5 **miles in a** SE **direction from** CHINA, **which is the nearest town in the**

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 10/09/2024

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	04/04/2024	898449
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 07/15/2024 **Date of first production after rig** 10/09/2024
Date plug back, deepening, drilling operation 07/15/2024 **Date plug back, deepening, recompletion, drilling operation** 10/09/2024
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 470.00 **Elevation** 22 GL
Total depth TVD 8752 **Total depth MD**
Plug back depth TVD 8650 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing Is Cementing Affidavit (Form W-15)** 55.5 Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:
Location of well, relative to nearest lease of lease on which this well is 692.0 **Feet from the** West **Line and** 2409.0 **Feet from the** South **Line of the** BEAD FARM CO. **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1100.0	**Date**	03/21/2024
SWR 13 Exception		**Depth**	2265.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
1	Surface	13 3/8	17 1/2	2244			H	1115	2210.4	0	Circulated to Surface
2	Conductor	20	26	120			A	230	274.0	0	Circulated to Surface
3	Conventional Production	9 5/8	12 1/4	8731			H	2010	3804.0	0	Circulated to Surface

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
1	7	7491	7491 / WIRELINE SET, PERMANENT

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
1	No	L 7540	7769.0
2	No	L 7962	8026.0
3	No	L 8107	8124.0
4	No	L 8143	8160.0

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG)

Actual maximum pressure (PSIG) during hydraulic fracturing

fracturin

Has the hydraulic fracturing fluid disclosure been

No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)	
1	Other	PERFORATIONS	7540	8160

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
CAPROCK - DISPOSAL	No			No	NOT ENCOUNTERED
SPINDLETOP SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
FANNETT SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
BIG HILL SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
PLEISTOCENE-LISSIE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
MIOCENE - DISPOSAL	Yes	3582.0	3583.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6621.0	6622.0	Yes	LOGGED - PERFORATIONS IN THE LOWER FRIO SAND FROM 7,540'-8,160'
MARINULINA - DISPOSAL	Yes	6208.1	6208.0	Yes	LOGGED
HETEROSTEGINA - DISPOSAL	Yes	6356.0	6357.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS PERFORATED AND SHUT IN. THIS WELL HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

CASING RECORD :

NONE.

TUBING RECORD:

PRODUCING/INJECTION/DISPOSAL INTERVAL :

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION

Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	02/10/2025

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: Exxon Mobil 100 Carbon Solutions	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson
Well No.: Bead Farm CO. #2	API No.: 42-245-32911 / Drilling Permit No.: 898449
Lease Name: Bead Farm CO. #2	Lease No.:
Field Name: Wildcat	Field No.:

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☑ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 17.5"	Depth of drilled hole (ft.): 2254	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.): 13 3/8"	Casing weight (lbs/ft) and grade: 68# J55	No. of centralizers used: 19
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 2244	Top of liner (ft.): / Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date: 7/17/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	730	A	SEE RAMARKS	1719.15	2158
2	385	XH	SEE REMARKS	491.26	654
3					
Total	1115			2210.41	2812

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

909463543,EXXONMOBIL LOW CARBON-EBUS,Bead Farm CO #2,SURFACE:
SLURRY 1:EconoCem , SLURRY 2:HALCem

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

ZOUHIR ROUBACHE	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	7/17/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James Harvey	Operations Supervisor		
Typed or printed name of operator's representative	Title	Signature	
22777 Springwoods Village	Spring Tx 77389	512 949 8272	7/17/24
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name:	Bryd Oilfield	Operator P-5 No.:	
Cementer Name:	CUDD Pumping Services	Cementer P-5 No.:	191917

WELL INFORMATION

District No.:		County:	Jefferson		
Well No.:	#2	API No.:		Drilling Permit No.:	
Lease Name:	Bead Farm Co	Lease No.:			
Field Name:		Field No.:			

I. CASING CEMENTING DATA

Type of casing: [X] Conductor [ ] Surface [ ] Intermediate [ ] Liner [ ] Production

Drilled hole size (in.): 26	Depth of drilled hole (ft.): 120	Est. % wash-out or hole enlargement: 30	
Size of casing in O.D. (in.): 20	Casing weight (lbs/ft) and grade: 78.6 ppf X-52 (Welded)	No. of centralizers used:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [X] YES [ ] NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 120	Top of liner (ft.):	Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date: 7/2/2024	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	230	Class A	Plus Adds	274	182
2					
3					
Total	230			274	182

II. CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement shoe [ ] Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:	
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:	
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:		
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] YES [ ] NO	Setting depth shoe (ft.):		
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement/DV tool [ ] Multiple parallel strings

Drilled hole size	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:	
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:	
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:		
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] YES [ ] NO	Setting depth tool (ft.):		
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date				-	-	-	-
Size of hole of pipe (in.)	-	-	-	-	-	-	-
Depth to bottom of tubing or drill pipe (ft.)	-	-	-	-	-	-	-
Cement retainer setting depth (ft.)	-	-	-	-	-	-	-
CIBP setting depth (ft.)	-	-	-	-	-	-	-
Amount of cement on top of CIBP (ft.)	-	-	-	-	-	-	-
Sacks of cement used				-	-	-	-
Slurry volume pumped (cu. ft.)				-	-	-	-
Calculated top of plug (ft.)				-	-	-	-
Measured top of plug, if tagged (ft.)			-	-	-	-	-
Slurry weight (lbs/gal)				-	-	-	-
Class/type of cement				-	-	-	-
Perforate and squeeze (YES/NO)	-	-	-	-	-	-	-

REMARKS	
1	**10 Bbls of cement to surface**
2	
3	
4	

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

KELSI BARNETT	Service Supervisor	CUDD Pumping Services	Kelsi Barnett
Name and title of cementer's representative		Cementing Company	Signature

1434 CR 422	Pleasanton	TX	78064	(830)-254-4200	7/2/2024
Address	City,	State, Zip Code		Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that the data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

Michael Mathis	Rig Supervisor	
Typed or printed name of operator's representative	Title	Signature

			512	949-8272	7/2/2024
Address	City,	State, Zip Code		Tel: Area Code	Number Date:

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

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C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

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D. **Estimated % wash-out:** If the estimated % wash-outis less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: ExxonMobil Low Carbon Solution	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson	
Well No.: Bead Farm Co. #2	API No.: 42-245-32911	Drilling Permit No.: 898449
Lease Name: Bead Farm Co. #2	Lease No.:	
Field Name: Wildcat	Field No.:	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☒ Production

Drilled hole size (in.): 12-1/4"	Depth of drilled hole (ft.): 8752'	Est. % wash-out or hole enlargement: 0%
Size of casing in O.D. (in.): 9-5/8"	Casing weight (lbs/ft) and grade: 47/53.5 ppf L80/13Cr/25Cr	No. of centralizers used: 179
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 8731'	Top of liner (ft.):
		Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date: 8-1-2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	735	H	N/A	1341	1907
2	1275	H	N/A	2463	6826
3					
Total	2010			3804	8733

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXON, BEAD FARM CO, #2, PRODUCTION

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JEROD HACK, SERVICE SUPERVISOR	Halliburton			
Name and title of cementer's representative	Cementing Company		Signature	
4720 Industrial	Bossier City, LA 71112		903-986-5096	8-1-2024
Address	City, State, Zip Code		Tel: Area Code Number	Date: mo. day yr.

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MICHAEL MATHIS	WELL OPERATIONS SUPERVISOR	
Typed or printed name of operator's representative	Title	Signature
	(512) 949-8272	08-1-2024
Address City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

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D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON | Sperry Drilling

DGR / EWR-P4 / DIR

Powered by INSITE™

1 : 500

MD Phase Attenuation Log

Country : USA
Field : WILDCAT
Location : Lat: 29° 59' 27.66" North Long: 94° 17' 52.93" West
Well : BEAD FARM CO. 2
Company : EXXONMOBIL LOW C SOL ON STOR LL
Rig : NABORS X33

Company	: EXXONMOBIL LOW C SOL ON STOR LL
Rig	: NABORS X33
Well	: BEAD FARM CO. 2
Field	: WILDCAT
Country	: USA
API Number	: 4224532911

LOCATION

Latitude : 29° 59' 27.66" North
Longitude : 94° 17' 52.93" West

StatePlane X = 3,456,559.210 usft
StatePlane Y = 13,937,806.680 usft

Other Services

Permanent Datum : Ground Level
Elevation : 25.90 ft
Log Measured From : Drill Floor
32.52 ft Above Permanent Datum
Drilling Measured From :

MD LOG

Elev. KB
DF 58.42 ft
GL 25.90 ft
WD

Depth Logged : 152.00 ft To 8,752.00 ft
Date Logged : 15-Jul-24 To 24-Jul-24
Total Depth MD : 8,752.00 ft TVD : 8,751.76 ft
Spud Date : 15-Jul-24

Unit No. : NA
Job No. : LF-XX-0909093079
Plot Type : Final
Plot Date : 06-Aug-24

Run No.	Borehole Record (MD)			Size	Casing Record (MD)		
	Size	From	To		Weight	From	To
100	17.500 in	152.00 ft	2,254.00 ft	20.000 in	78.60 lbpf	SURFACE	152.50 ft
200	12.250 in	2,254.00 ft	3,120.00 ft	13.375 in	68.00 lbpf	SURFACE	2,244.00 ft
201	12.250 in	3,120.00 ft	3,150.00 ft	9.625 in	47.00 lbpf	SURFACE	8,731.00 ft
300	12.250 in	3,150.00 ft	4,350.00 ft				
301	12.250 in	4,350.00 ft	4,410.00 ft				
400	12.250 in	4,410.00 ft	7,586.00 ft				
401	12.250 in	7,586.00 ft	7,647.00 ft				
500	12.250 in	7,647.00 ft	8,752.00 ft				

WELL INFORMATION

MWD Run Number	100	200	300	400	500
Date run completed	16-Jul-24	18-Jul-24	20-Jul-24	22-Jul-24	25-Jul-24
Rig Bit Number	100	200	300	400	500
Bit Size (in)	17.500	12.250	12.250	12.250	12.250
Tool Nominal OD (in)	8.000	8.000	8.000	8.000	8.000
Log Start Depth (MD, ft)	152.00	2,254.00	3,150.00	4,410.00	7,647.00
Log End Depth (MD, ft)	2,254.00	3,120.00	4,350.00	7,586.00	8,752.00
Drill or Wipe	Drill	Drill	Drill	Drill	Drill
Drill/Wipe Start Date and Time	15-Jul-24 09:55	18-Jul-24 12:02	19-Jul-24 18:40	21-Jul-24 09:21	24-Jul-24 05:40
Drill/Wipe End Date and Time	15-Jul-24 21:40	18-Jul-24 17:31	20-Jul-24 03:03	22-Jul-24 15:52	24-Jul-24 19:25
Min Inc (deg) @ Depth (MD, ft)	0.06 @ 956.00	0.42 @ 2,276.00	0.09 @ 4,323.00	0.18 @ 5,208.00	0.00 @ 8,035.00
Max Inc (deg) @ Depth (MD, ft)	0.97 @ 1,621.00	0.75 @ 2,656.00	0.45 @ 3,128.00	0.56 @ 4,538.00	0.44 @ 7,753.00
Bit TFA(in2) / Bit Type	1.23 / GT65s	1.23 / HD65s	1.23 / HD65s	1.23 / HD65s	1.23 / HD65s
Flow Rate (gpm)	700.00	690.00	690.00	700.00	696.00
Max AV (fpm) / CV (fpm) @ MWD	79.0 / 46.0	61.0 / 40.0	61.5 / 43.0	43.7 / 40.0	43.7 / 40.0
Fluid Type	Native/Spud Mud	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base
Density (ppg) / Viscosity (spqt)	8.50 / 28.00	10.40 / 103.00	10.40 / 101.00	10.30 / 59.00	10.30 / 64.00
Filtrate CL (ppm)	1,100.00	46,000.00	46,000.00	67,000.00	63,000.00
pH / API Filtrate (mptm)	6.90 / 12	N/A / 12	N/A / 12	N/A / 20	N/A / 20
PV (cP) / YP (lhf2)	2 / 2.00	26 / 19.00	26 / 19.00	19 / 23.00	22 / 20.00
% Solids / % Sand	1 / .01	12.2 / 0.01	12 / .01	8.7 / 0.01	11.1 / 0.01
% Oil / Oil:Water Ratio	0 / 0:100	52 / 60:40	52 / 60:40	56 / 64:36	56 / 65:35
Rm @ Measured Temp (degF)	0.200 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmf @ Measured Temp (degF)	0.200 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	0.200 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Max Tool Temp (degF) / Source	113.18 / HCIM	129.00 / HCIM	141.41 / HCIM	162.00 / HCIM	165.00 / HCIM
Rm @ Max Tool Temp (degF)	N/A @ 113.18	N/A @ 129.00	N/A @ 141.41	N/A @ 162.00	N/A @ 165.00
Lead MWD Engineer	Coy Lorraine	Coy Lorraine	Coy Lorraine	Coy Lorraine	Coy Lorraine
Customer Representative	James Harvey	James Harvey	James Harvey	James Harvey	James Harvey

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM	HCIM	HCIM	HCIM
Software Version	98.43	98.43	98.43	98.43	98.43
Sub Serial Number	11717163	11717163	11717163	11717163	11717163
Insert Serial Number	12522587	12522587	12522587	12522587	12522587
Date and Time Initialized	15-Jul-24 09:06	17-Jul-24 23:37	19-Jul-24 16:43	21-Jul-24 02:28	24-Jul-24 01:24
Date and Time Read	16-Jul-24 12:59	19-Jul-24 00:54	20-Jul-24 10:06	23-Jul-24 01:22	25-Jul-24 06:02
ECMB SW Version	N/A	N/A	N/A	N/A	N/A

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	PCDC
Distance From Bit (ft)	35.84	26.21	26.21	65.57	68.20
Software Version	6.43	6.43	6.43	6.43	6.43
Sub Serial Number	121840	121840	121840	121840	111
Sonde Serial Number	13008879	13008879	13008879	13008879	13008879
Sensor ID Number	N/A	N/A	N/A	N/A	N/A
Toolface Offset (deg)	0.00	0.00	0.00	282.46	271.38

Gamma Ray Sensor Information

Tool Type	DGR	DGR	DGR	DGR	DGR
Distance From Bit (ft)	25.26	15.63	15.63	54.99	57.62
Recorded Sample Period (sec)	4	4	4	4	4
Software Version	N/A	N/A	N/A	N/A	N/A
Sub Serial Number	13166196	13166196	13166196	13166196	13166196
Insert/Sonde Serial Number	11671530	11671530	11671530	11674530	11674530

Resistivity Sensor Information

Tool Type	EWR-P4				
Distance From Bit (ft)	11.03				
Recorded Sample Period (sec)	4				
Software Version	1.51				
Sub Serial Number	10673350				
Receiver Insert Serial Number	11827847				
Transmitter Insert Serial Number	11707807				
Receiver Orientation	Down				

REMARKS

All depths are referenced to the driller's pipe tally.

DGXT - Gamma Ray formation exposure time
EWXT - Resistivity formation exposure time

Default 1:500 Log Smoothing:
Interval Resolution: 0.5ft
Window Interval:(+/-) 0.6ft
Gap Fill: 3.0ft

Archive Name: BEAD_FARM_CO_2_500MD_PHASE_ATTEN_152_8752

Plot Width: 8.25 in

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division
Tracking No.: 326169

ELECTRIC LOG STATUS REPORT

This facsimile L-1 was generated electronically from data submitted to the RRC.

FORM L-1

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 10/09/2024
Field Name WILDCAT	Drilling Permit No. 898449	
Lease Name BEAD FARM CO.	Lease/ID No. 28125	Well No. 2
County JEFFERSON	API No. 42- 245-32911	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

Lease or ID No(s). _____

Well No(s). _____

Josh Calkin
Signature

Title

EXXONMOBIL LOW C SOL ON STOR LLC
Name (print)

(281) 702-5537
Phone

12/18/2024
Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Kristen Killen,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **July 15, 2024 to July 24, 2024** conduct or supervise the taking of Directional Surveys as follow:

- **204' to a depth of 8682' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8752'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **BEAD FARM CO. 2** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Kristen Killen, Log Analyst

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON
4607 HWY 90 EAST • BROUSSARD, LA 70518
PHONE 337 837 3061 • FAX 337 837 4400

July 31, 2024

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
BEAD FARM CO. 2
Permit No. 898449
Jefferson County, TX
API # 42-245-32911

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Kristen Killen, Log Analyst
Drainhole Number	-	Original
Surveyed Depths	-	204' – 8682' MWD Surveys performed by Sperry Drilling
Dates Performed	-	July 15, 2024 to July 24, 2024
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,

Kristen Killen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 908567108

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx_NAD83
Rose Prospect CCS
Bead Farm Co. #2
4224532911
002 ST00BP00

Design: 002 ST00BP00

Sperry Drilling Services

Geodetic Report

06 August, 2024

Well Coordinates: 13,937,806.68 N, 3,456,559.21 E (29° 59' 27.66" N, 094° 17' 52.93" W)
Ground Level: 25.90 usft

Local Coordinate Origin:	Centered on Well Bead Farm Co. #2
Viewing Datum:	(32.52') Nabors X-33 @ 58.42usft (Spud)
TVDs to System:	N
North Reference:	Grid
Unit System:	API US Survey Feet

Version: 5000.17 Build: 02

HALLIBURTON

Design Report for Bead Farm Co. #2 - 002 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	29° 59' 27.655 N	94° 17' 52.927 W	13,937,806.68	3,456,559.21
204.00	0.92	282.45	203.99	0.35	-1.60	29° 59' 27.659 N	94° 17' 52.945 W	13,937,807.03	3,456,557.61
317.00	0.69	283.37	316.98	0.71	-3.15	29° 59' 27.663 N	94° 17' 52.962 W	13,937,807.39	3,456,556.06
409.00	0.59	277.83	408.97	0.90	-4.16	29° 59' 27.666 N	94° 17' 52.974 W	13,937,807.58	3,456,555.05
503.00	0.55	276.15	502.97	1.01	-5.08	29° 59' 27.667 N	94° 17' 52.984 W	13,937,807.69	3,456,554.13
596.00	0.25	295.16	595.97	1.15	-5.71	29° 59' 27.669 N	94° 17' 52.991 W	13,937,807.83	3,456,553.50
689.00	0.13	286.13	688.97	1.26	-6.00	29° 59' 27.670 N	94° 17' 52.994 W	13,937,807.94	3,456,553.21
779.00	0.18	100.25	778.97	1.27	-5.95	29° 59' 27.670 N	94° 17' 52.994 W	13,937,807.95	3,456,553.26
878.00	0.22	94.50	877.97	1.22	-5.61	29° 59' 27.670 N	94° 17' 52.990 W	13,937,807.90	3,456,553.60
956.00	0.06	132.43	955.97	1.18	-5.43	29° 59' 27.669 N	94° 17' 52.988 W	13,937,807.86	3,456,553.78
1,053.00	0.18	44.89	1,052.97	1.26	-5.29	29° 59' 27.670 N	94° 17' 52.986 W	13,937,807.94	3,456,553.92
1,145.00	0.06	340.24	1,144.97	1.41	-5.20	29° 59' 27.671 N	94° 17' 52.985 W	13,937,808.09	3,456,554.01
1,239.00	0.40	289.30	1,238.96	1.56	-5.53	29° 59' 27.673 N	94° 17' 52.989 W	13,937,808.24	3,456,553.68
1,335.00	0.31	295.83	1,334.96	1.78	-6.08	29° 59' 27.675 N	94° 17' 52.995 W	13,937,808.46	3,456,553.13
1,430.00	0.45	241.44	1,429.96	1.72	-6.64	29° 59' 27.675 N	94° 17' 53.002 W	13,937,808.40	3,456,552.57
1,525.00	0.57	208.34	1,524.96	1.12	-7.19	29° 59' 27.669 N	94° 17' 53.008 W	13,937,807.80	3,456,552.02
1,621.00	0.97	195.75	1,620.95	-0.08	-7.64	29° 59' 27.657 N	94° 17' 53.014 W	13,937,806.60	3,456,551.57
1,718.00	0.92	199.79	1,717.94	-1.60	-8.12	29° 59' 27.643 N	94° 17' 53.020 W	13,937,805.08	3,456,551.09
1,906.00	0.93	203.82	1,905.91	-4.42	-9.25	29° 59' 27.615 N	94° 17' 53.034 W	13,937,802.26	3,456,549.96
1,995.00	0.81	210.03	1,994.90	-5.62	-9.86	29° 59' 27.604 N	94° 17' 53.041 W	13,937,801.06	3,456,549.35
2,092.00	0.53	241.70	2,091.89	-6.43	-10.59	29° 59' 27.596 N	94° 17' 53.050 W	13,937,800.25	3,456,548.62
2,186.00	0.42	264.00	2,185.89	-6.67	-11.32	29° 59' 27.594 N	94° 17' 53.059 W	13,937,800.01	3,456,547.89
2,218.00	0.38	217.95	2,217.89	-6.77	-11.50	29° 59' 27.593 N	94° 17' 53.061 W	13,937,799.91	3,456,547.71
2,276.00	0.42	192.90	2,275.89	-7.13	-11.67	29° 59' 27.589 N	94° 17' 53.063 W	13,937,799.55	3,456,547.54
2,372.00	0.45	186.31	2,371.89	-7.84	-11.79	29° 59' 27.582 N	94° 17' 53.064 W	13,937,798.84	3,456,547.42
2,465.00	0.53	177.70	2,464.88	-8.64	-11.81	29° 59' 27.574 N	94° 17' 53.065 W	13,937,798.04	3,456,547.40
2,560.00	0.72	219.69	2,559.88	-9.54	-12.17	29° 59' 27.566 N	94° 17' 53.070 W	13,937,797.14	3,456,547.04
2,656.00	0.75	210.71	2,655.87	-10.54	-12.88	29° 59' 27.556 N	94° 17' 53.078 W	13,937,796.14	3,456,546.33
2,751.00	0.59	212.16	2,750.86	-11.49	-13.46	29° 59' 27.547 N	94° 17' 53.085 W	13,937,795.19	3,456,545.75
2,843.00	0.50	209.35	2,842.86	-12.24	-13.91	29° 59' 27.540 N	94° 17' 53.091 W	13,937,794.44	3,456,545.30
2,936.00	0.55	200.99	2,935.86	-13.01	-14.27	29° 59' 27.532 N	94° 17' 53.095 W	13,937,793.67	3,456,544.94
3,030.00	0.43	201.88	3,029.85	-13.76	-14.56	29° 59' 27.525 N	94° 17' 53.099 W	13,937,792.92	3,456,544.65
3,128.00	0.45	214.48	3,127.85	-14.42	-14.91	29° 59' 27.519 N	94° 17' 53.103 W	13,937,792.26	3,456,544.30
3,222.00	0.45	234.79	3,221.85	-14.93	-15.42	29° 59' 27.514 N	94° 17' 53.109 W	13,937,791.75	3,456,543.79
3,316.00	0.33	225.02	3,315.84	-15.34	-15.92	29° 59' 27.510 N	94° 17' 53.115 W	13,937,791.34	3,456,543.29
3,412.00	0.31	224.75	3,411.84	-15.72	-16.30	29° 59' 27.506 N	94° 17' 53.119 W	13,937,790.96	3,456,542.91
3,505.00	0.25	207.09	3,504.84	-16.08	-16.57	29° 59' 27.503 N	94° 17' 53.122 W	13,937,790.60	3,456,542.64
3,560.05	0.27	213.40	3,559.90	-16.29	-16.69	29° 59' 27.501 N	94° 17' 53.124 W	13,937,790.39	3,456,542.52
3,600.00	0.28	217.48	3,599.84	-16.45	-16.80	29° 59' 27.499 N	94° 17' 53.125 W	13,937,790.23	3,456,542.41
3,694.00	0.33	206.67	3,693.84	-16.87	-17.06	29° 59' 27.495 N	94° 17' 53.128 W	13,937,789.81	3,456,542.15
3,789.00	0.35	223.05	3,788.84	-17.33	-17.38	29° 59' 27.491 N	94° 17' 53.132 W	13,937,789.35	3,456,541.83
3,884.00	0.22	220.41	3,883.84	-17.68	-17.70	29° 59' 27.487 N	94° 17' 53.136 W	13,937,789.00	3,456,541.51

Design Report for Bead Farm Co. #2 - 002 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
3,978.00	0.18	201.67	3,977.84	-17.95	-17.87	29° 59' 27.485 N	94° 17' 53.138 W	13,937,788.73	3,456,541.34
4,071.00	0.19	210.77	4,070.83	-18.22	-18.00	29° 59' 27.482 N	94° 17' 53.140 W	13,937,788.46	3,456,541.21
4,168.00	0.13	210.22	4,167.83	-18.45	-18.14	29° 59' 27.480 N	94° 17' 53.141 W	13,937,788.23	3,456,541.07
4,261.00	0.13	187.31	4,260.83	-18.65	-18.21	29° 59' 27.478 N	94° 17' 53.142 W	13,937,788.03	3,456,541.00
4,323.00	0.09	217.33	4,322.83	-18.76	-18.25	29° 59' 27.477 N	94° 17' 53.143 W	13,937,787.92	3,456,540.96
4,441.00	0.25	193.14	4,440.83	-19.08	-18.36	29° 59' 27.474 N	94° 17' 53.144 W	13,937,787.60	3,456,540.85
4,538.00	0.56	167.94	4,537.83	-19.75	-18.31	29° 59' 27.467 N	94° 17' 53.144 W	13,937,786.93	3,456,540.90
4,634.00	0.44	179.21	4,633.83	-20.58	-18.21	29° 59' 27.459 N	94° 17' 53.143 W	13,937,786.10	3,456,541.00
4,725.00	0.42	137.83	4,724.83	-21.18	-17.98	29° 59' 27.453 N	94° 17' 53.141 W	13,937,785.50	3,456,541.23
4,822.00	0.31	134.75	4,821.82	-21.62	-17.55	29° 59' 27.448 N	94° 17' 53.136 W	13,937,785.06	3,456,541.66
4,919.00	0.35	144.92	4,918.82	-22.05	-17.20	29° 59' 27.444 N	94° 17' 53.132 W	13,937,784.63	3,456,542.01
5,014.00	0.40	139.06	5,013.82	-22.54	-16.81	29° 59' 27.439 N	94° 17' 53.128 W	13,937,784.14	3,456,542.40
5,208.00	0.18	41.45	5,207.82	-22.82	-16.17	29° 59' 27.436 N	94° 17' 53.121 W	13,937,783.86	3,456,543.04
5,296.00	0.26	19.09	5,295.82	-22.53	-16.01	29° 59' 27.439 N	94° 17' 53.119 W	13,937,784.15	3,456,543.20
5,391.00	0.40	19.41	5,390.82	-22.01	-15.83	29° 59' 27.444 N	94° 17' 53.117 W	13,937,784.67	3,456,543.38
5,486.00	0.45	18.03	5,485.81	-21.35	-15.60	29° 59' 27.450 N	94° 17' 53.114 W	13,937,785.33	3,456,543.61
5,581.00	0.56	36.90	5,580.81	-20.62	-15.21	29° 59' 27.457 N	94° 17' 53.109 W	13,937,786.06	3,456,544.00
5,675.00	0.50	33.23	5,674.81	-19.91	-14.71	29° 59' 27.464 N	94° 17' 53.103 W	13,937,786.77	3,456,544.50
5,770.00	0.51	22.06	5,769.80	-19.17	-14.32	29° 59' 27.471 N	94° 17' 53.098 W	13,937,787.51	3,456,544.89
5,865.00	0.40	18.74	5,864.80	-18.47	-14.06	29° 59' 27.478 N	94° 17' 53.095 W	13,937,788.21	3,456,545.15
5,958.00	0.37	14.53	5,957.80	-17.87	-13.88	29° 59' 27.484 N	94° 17' 53.093 W	13,937,788.81	3,456,545.33
6,052.00	0.43	3.54	6,051.79	-17.22	-13.78	29° 59' 27.490 N	94° 17' 53.091 W	13,937,789.46	3,456,545.43
6,148.00	0.40	11.29	6,147.79	-16.53	-13.69	29° 59' 27.497 N	94° 17' 53.090 W	13,937,790.15	3,456,545.52
6,337.00	0.33	8.33	6,336.79	-15.35	-13.48	29° 59' 27.509 N	94° 17' 53.087 W	13,937,791.33	3,456,545.73
6,432.00	0.47	1.15	6,431.79	-14.69	-13.44	29° 59' 27.515 N	94° 17' 53.086 W	13,937,791.99	3,456,545.77
6,525.00	0.25	13.41	6,524.78	-14.11	-13.38	29° 59' 27.521 N	94° 17' 53.085 W	13,937,792.57	3,456,545.83
6,620.00	0.25	11.01	6,619.78	-13.70	-13.30	29° 59' 27.525 N	94° 17' 53.084 W	13,937,792.98	3,456,545.91
6,715.00	0.33	347.54	6,714.78	-13.23	-13.31	29° 59' 27.530 N	94° 17' 53.084 W	13,937,793.45	3,456,545.90
6,808.00	0.18	303.99	6,807.78	-12.89	-13.49	29° 59' 27.533 N	94° 17' 53.086 W	13,937,793.79	3,456,545.72
6,904.00	0.32	328.92	6,903.78	-12.58	-13.76	29° 59' 27.536 N	94° 17' 53.089 W	13,937,794.10	3,456,545.45
6,998.00	0.33	301.62	6,997.78	-12.21	-14.12	29° 59' 27.540 N	94° 17' 53.093 W	13,937,794.47	3,456,545.09
7,093.00	0.18	292.51	7,092.78	-12.01	-14.49	29° 59' 27.542 N	94° 17' 53.097 W	13,937,794.67	3,456,544.72
7,185.00	0.19	340.74	7,184.78	-11.81	-14.68	29° 59' 27.544 N	94° 17' 53.099 W	13,937,794.87	3,456,544.53
7,280.00	0.25	232.06	7,279.78	-11.79	-14.89	29° 59' 27.545 N	94° 17' 53.101 W	13,937,794.89	3,456,544.32
7,377.00	0.18	243.61	7,376.78	-11.99	-15.20	29° 59' 27.543 N	94° 17' 53.105 W	13,937,794.69	3,456,544.01
7,562.00	0.43	219.04	7,561.77	-12.65	-15.89	29° 59' 27.536 N	94° 17' 53.113 W	13,937,794.03	3,456,543.32
7,753.00	0.44	255.06	7,752.77	-13.40	-17.05	29° 59' 27.529 N	94° 17' 53.127 W	13,937,793.28	3,456,542.16
7,941.00	0.18	301.28	7,940.77	-13.43	-18.00	29° 59' 27.530 N	94° 17' 53.138 W	13,937,793.25	3,456,541.21
8,035.00	0.00	255.07	8,034.77	-13.36	-18.13	29° 59' 27.530 N	94° 17' 53.139 W	13,937,793.32	3,456,541.08
8,130.00	0.14	109.08	8,129.77	-13.39	-18.02	29° 59' 27.530 N	94° 17' 53.138 W	13,937,793.29	3,456,541.19
8,227.00	0.14	114.85	8,226.76	-13.48	-17.80	29° 59' 27.529 N	94° 17' 53.135 W	13,937,793.20	3,456,541.41
8,316.00	0.14	303.31	8,315.76	-13.47	-17.79	29° 59' 27.529 N	94° 17' 53.135 W	13,937,793.21	3,456,541.42

Design Report for Bead Farm Co. #2 - 002 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
8,411.00	0.18	307.83	8,410.76	-13.31	-18.01	29° 59' 27.531 N	94° 17' 53.138 W	13,937,793.37	3,456,541.20
8,506.00	0.32	289.23	8,505.76	-13.13	-18.38	29° 59' 27.533 N	94° 17' 53.142 W	13,937,793.55	3,456,540.83
8,598.00	0.25	303.28	8,597.76	-12.94	-18.79	29° 59' 27.535 N	94° 17' 53.146 W	13,937,793.74	3,456,540.42
8,682.00	0.43	313.57	8,681.76	-12.62	-19.17	29° 59' 27.538 N	94° 17' 53.150 W	13,937,794.06	3,456,540.04
8,752.00	0.43	313.57	8,751.76	-12.26	-19.55	29° 59' 27.542 N	94° 17' 53.155 W	13,937,794.42	3,456,539.66

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,752.00	8,751.76	-12.26	-19.55	Proj. to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
204.00	2,218.00	01 HAL MWD (MagVarMS) 17 1/2" Hole 204' - 2218'	3_MWD+HRGM+MS
2,276.00	8,682.00	02 HAL MWD (MagVarMS) 12 1/4" Hole 2276' - 8682'	3_MWD+HRGM+MS

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
152.50	152.50	20" Conductor Casing	20	20
2,244.00	2,243.89	13-3/8" Surface Casing	13-3/8	17-1/2
8,731.00	8,730.76	9-5/8" Production Casing	9-5/8	12-1/4

Design Report for Bead Farm Co. #2 - 002 ST00BP00

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated

Directional Difficulty Index

Average Dogleg over Survey:	0.17 °/100usft	Maximum Dogleg over Survey:	0.98 °/100usft at 2,218.00 usft
Net Tortousity applicable to Plans:	0.17 °/100usft	Directional Difficulty Index:	2.930

Audit Info

North Reference Sheet for Rose Prospect CCS - Bead Farm Co. #2 - 002 ST00BP00

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 58.42usft (Spud). Northing and Easting are relative to Bead Farm Co. #2

Coordinate System is US State Plane 1983, Texas South Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 1,968,500.00usft, False Northing: 13,123,333.33usft, Scale Reduction: 0.99992863

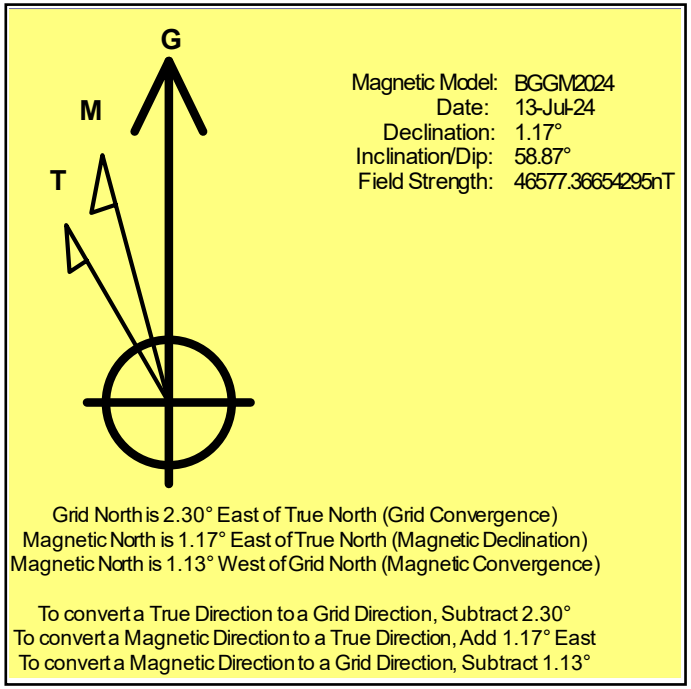
Grid Coordinates of Well: 13,937,806.68 usft N, 3,456,559.21 usft E

Geographical Coordinates of Well: 29° 59' 27.66" N, 094° 17' 52.93" W

Grid Convergence at Surface is: 2.30°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,752.00usft

the Bottom Hole Displacement is 23.07usft in the Direction of 237.91° (Grid).
Magnetic Convergence at surface is: 1.13° (13 July 2024, , BGGM2024)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898449	Apr 04, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32911	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	470

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE
This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.
District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM CO.	2
LOCATION	**TOTAL DEPTH**
4.5 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 41 BLOCK ABSTRACT 266

SURVEY T&NO RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1535 ft. WEST 2409 ft. SOUTH	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
692 ft. WEST 2409 ft. SOUTH	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	470.00	8,800	2	03
BEAD FARM CO.			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
BEAD FARM CO. #2
T.& N.O. R.R. CO. SURVEY, A-266
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759

D.C. TURNER SURVEY
A-658

T.& N.O.
R.R. CO. SURVEY
A-142

BHL: ST00
MD: 8682.00
TVD: 8681.76
From Surf Location:
27.538 N
53.150 W

SHL	TRACT CALLS	SURVEY CALLS	ELEV.
BEAD FARM CO. #2	2409' Sc. FSL 692' Sc. FWL	2409' Sc. FSL 1535' Sc. FWL	22.2'

KH Land Company, Ltd. Called 109.618 Acres Vol. 1240, Pg. 165 D.R.J.C.T.

Bead Farm Co. Vol. 879, Pg. 564 D.R.J.C.T.

SPERRY DRILLING JOB NO. 909093079
DATE SURVEYED July 24, 2024
SURVEYED FROM 204' TO 8682'
TIE-ON COORDINATES FROM Surface
BHL AT 8752.00 FT. (MD) = 23.07 FT.
AT 237.91° * Grid
FROM SURFACE LOCATION NW
BHL ____ = TO NW LEASE LINE

T.& N.O.
R.R. CO. SURVEY
A-869

T.& N.O. R.R. CO. SURVEY
A-266

W. L. STARK SURVEY
A-874

1535' Sc.
692' Sc.

BEAD FARM CO. #2
Y=13,937,806.77'
X=3,456,558.95'
LAT.=29°59'27.66"
LONG.=-94°17'52.93"

2409' Sc.

N
GRID

T.& N.O.
R.R. CO. SURVEY
A-254

J. C. GRANT SURVEY
A-128

A. REUSS SURVEY
A-196

Location is approximately 11.4 miles SW of Beaumont, Tx.
"FANNETT WEST" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 2.7 miles turn left (South) on Lease Road. Go 0.68 miles. Drive on location.

DATE SURVEYED: 8/23/2023-8/28/2023

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data and tract acreages shown hereon were furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

STATE OF TEXAS
REGISTERED
JIM G. GLASS
5262
PROFESSIONAL
LAND SURVEYOR

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS - - - COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: April 2, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: ECJ FB 2744/88-97 Job No. 430923 Map No. J-0923-LOC-INJ2B

CONFIDENTIAL BUSINESS INFORMATION

CHRISTI CRADDICK, CHAIRMAN
WAYNE CHRISTIAN, COMMISSIONER
JIM WRIGHT, COMMISSIONER

DANNY SORRELLS
DIRECTOR, OIL AND GAS DIVISION
PETER FISHER, P.G.
DISTRICT DIRECTOR

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

OPERATOR Name:	EXXONMOBIL LOW C SOL ON	**RE:**	**Lease:**	Bead Farm Co.
Address1:	ATTN EDWARD E GRAHAM W1.2B.02			
Address2:	22777 SPRINGWOODS VILLAGE PKWY	**Well No:**	2	
City:	SPRING	**Sec:**	41	**Block:**
State:	TX	**County:**	JEFFERSON	
		Survey Name:	T&NO RR CO	

SWR13EX Application Number: 130361 **Drilling Permit No:**

SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for **LEASE** Bead Farm Co. ;
WELL 2 has been approved by the Railroad Commission of Texas District Office.

a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.

b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.

c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.

d. The casing and cement program shall adhere to the following specifications:

Set 2265 feet of surface casing and circulate cement from the shoe to the ground surface.

DP 909449 - Exxonmobil, Bead Farm Co. Lease Well 2 (245 32911)

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted 05/20/2024 .
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: AUDREY KUKLENZ DATE: 05/20/2024

PETER FISHER, P.G.

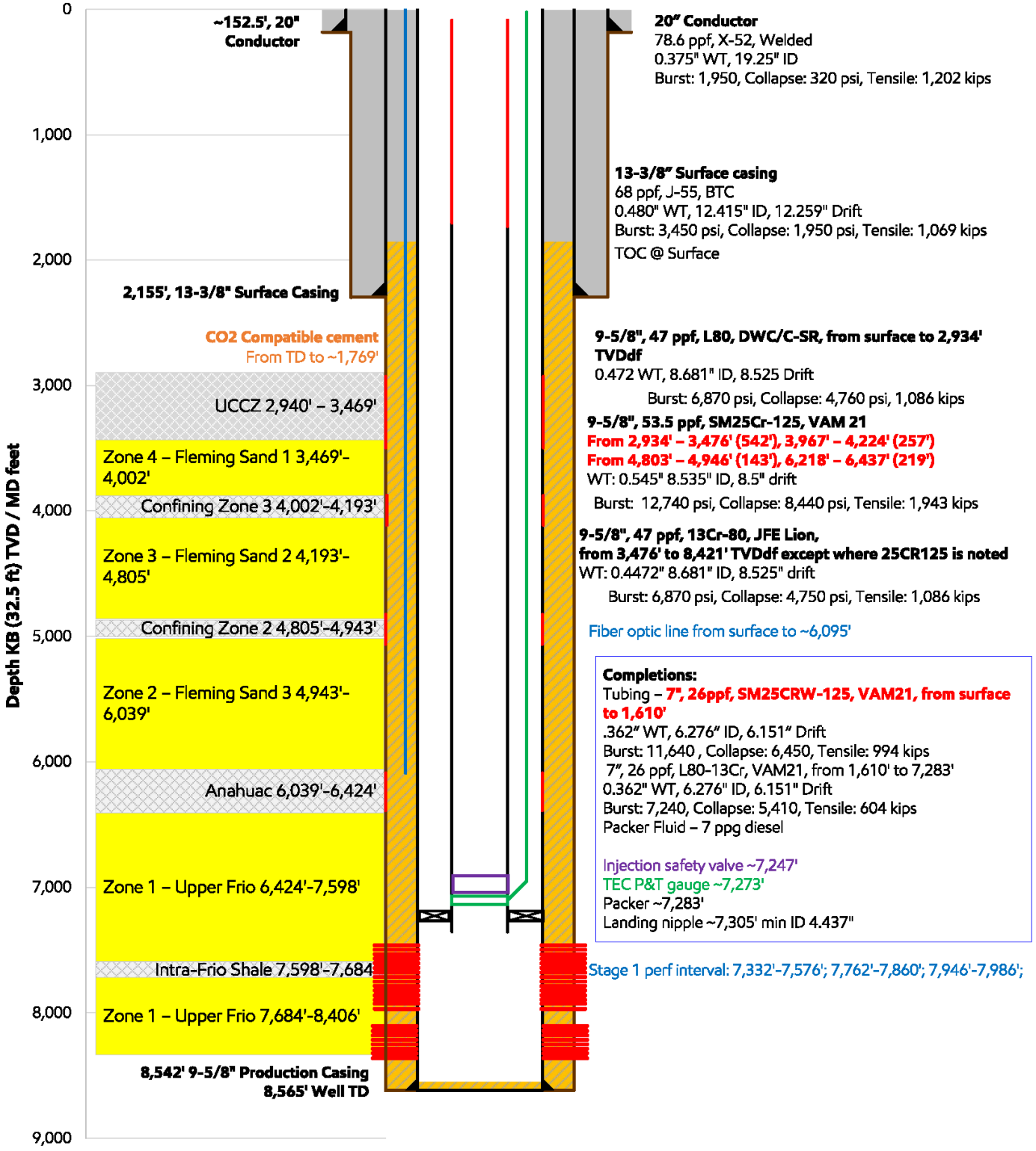
DISTRICT DIRECTOR

CONFIDENTIAL BUSINESS INFORMATION

4224532912 Bead Farm Co. 3 (Rose CCS Project Injection Well No. 03)

Rose CCS Project Bead Farm 3

Completions Wellbore Schematic – Frio Injection



ERM

Appendix D.1
Completions Wellbore Schematic for Rose CCS Project
Injection Well No. 03
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, TX

CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32912
Drilling Permit # 898450
SWR Exception

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256

2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC

3. Operator Address (include street, city, state, zip): ATTN EDWARD E GRAHAM, 22777 SPRINGWOODS VILLAGE PKWY, SPRING, TX 77389-0000

4. Lease Name: BEAD FARM

5. Well No.: 3

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 10000

9. Do you have the right to develop the minerals under any right-of-way ? [X] Yes [ ] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03

12. County: JEFFERSON

13. Surface Location [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 3.35 miles in a SE direction from China which is the nearest town in the county of the well site.

15. Section: 8

16. Block:

17. Survey: HT&B RR CO/TURNER, D C

18. Abstract No.: A-658

19. Distance to nearest lease line: ft.

20. Number of contiguous acres in lease, pooled unit, or unitized tract: 650

21. Lease Perpendiculars: 1742 ft from the WEST line and 2937 ft from the NORTH line.

22. Survey Perpendiculars: 1742 ft from the WEST line and 2937 ft from the NORTH line.

23. Is this a pooled unit? [ ] Yes [X] No

24. Unitization Docket No:

25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION — List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	8600	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks
See W1 Comments attached

Certificate:
I certify that information stated in this application is true and complete, to the best of my knowledge.

Josh Calkin — Name of filer
Mar 27, 2024 — Date submitted

(281)702-5537 — Phone
Josh.Calkin@erm.com — E-mail Address (OPTIONAL)

RRC Use Only Data Validation Time Stamp: Mar 26, 2025 1:56 PM(Current Version)

CONFIDENTIAL BUSINESS INFORMATION

Permit Status: Approved

The RRC has not approved this application. Duplication or distribution of information is at the user's own risk.

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

W-1 Comments

Permit # 898450

Approved Date: Apr 17, 2024

[RRC STAFF Mar 28, 2024 4:19 PM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 4, 2024 3:22 PM]: Problems identified with this permit are resolved.; [RRC STAFF Apr 4, 2024 3:23 PM]: Amended plat uploaded.; [RRC STAFF Apr 4, 2024 5:01 PM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 5, 2024 11:57 AM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 17, 2024 5:41 PM]: Problems identified with this permit are resolved.; [RRC STAFF Apr 17, 2024 5:41 PM]: Josh Calkin provided a revised plat on which the lease name has been updated to match the W-1.

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898450	Apr 17, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32912	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	650

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM	3
LOCATION	**TOTAL DEPTH**
3.35 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 8 BLOCK ABSTRACT 658

SURVEY HT&B RR CO/TURNER, D C

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1742 ft. WEST 2937 ft. NORTH	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
1742 ft. WEST 2937 ft. NORTH	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	650.00	8,600	3	03
BEAD FARM			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	31 December 2024	**GAU Number:**	389718

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532912
		County:	JEFFERSON
		Lease Name:	Bead Farm
		Lease Number:	
Operator No.:	101256	**Well Number:**	3
		Total Vertical	10000
		Latitude:	30.011563
		Longitude:	-94.297672
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-HT&B RR CO/TURNER, D C; Abstract-658; Section-8

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Initial Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1,225 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1,450 feet at the site of the referenced well.

*(SIP Purpose Only) Water Code Section 27.046(a) requires the GAU to issue a GW-2 letter containing Non-Endangerment language prior to issuance of a class VI permit. An additional letter will be required before SIP can issue a final permit because this letter is silent on endangerment of fresh water. *

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 12/19/2024. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	28 January 2025	**GAU Number:**	390199

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532912
		County:	JEFFERSON
		Lease Name:	Bead Farm
		Lease Number:	
Operator No.:	101256	**Well Number:**	3
		Total Vertical	10000
		Latitude:	30.011563
		Longitude:	-94.297672
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-HT&B RR CO/TURNER, D C; Abstract-658; Section-8

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1200 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1450 feet at the site of the referenced well.

This recommendation is applicable to all wells within a radius of 1.0 mile of this location.

The vertical geological isolation from both bases of usable quality water and underground source of drinking water is at 3,200 feet in TVD depth (for UIC Purpose Only).

Injection into the subsurface interval from 3400 to 8600 feet in TVD depth, as proposed in the submitted W14 (Class VI) application dated on December 18th of 2024 , WILL NOT ENDANGER the PROTECTED WATER STRATA geologically at the proposed location in this area (for UIC Purpose Only).

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 01/22/2025. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 02/20/2025
Tracking No.: 326180

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-0000

WELL INFORMATION

API 42-245-32912 **County:** JEFFERSON
Well No.: 3 **RRC District** 03
Lease BEAD FARM **Field** WILDCAT
RRC Lease 28200 **Field No.:** 00006001
Location Section: 8, Block: , Survey: HT&B RR CO/TURNER, D C, Abstract: 658

Latitude 30 **Longitud** -94
This well is 3.35 **miles in a** SE
direction from CHINA,
which is the nearest town in the

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 10/18/2024

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	04/17/2024	898450
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 08/05/2024 **Date of first production after rig** 10/18/2024
Date plug back, deepening, drilling operation 08/05/2024 **Date plug back, deepening, recompletion, drilling operation** 10/18/2024
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 650.00 **Elevation** 23 GL
Total depth TVD 8565 **Total depth MD**
Plug back depth TVD 8466 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing Is Cementing Affidavit (Form W-15)** 45.0 Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:
Location of well, relative to nearest lease of lease on which this well is 1742.0 **Feet from the** West **Line and** 2937.0 **Feet from the** North **Line of the** BEAD FARM **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1100.0	**Date**	03/21/2024
SWR 13 Exception		**Depth**	2170.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
1	Surface	13 3/8	17 1/2	2155			H	1090	2151.0	0	Circulated to Surface
2	Conductor	20	26	120			A	230	274.0	0	Circulated to Surface
3	Conventional Production	9 5/8	12 1/4	8548			H	2015	3815.0	0	Circulated to Surface

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
1	7	7283	7283 / WIRELINE SET, PERMANENT

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
1	No	L 7332	7576.0
2	No	L 7762	7860.0
3	No	L 7946	7986.0

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG) hydraulic fracturing

Actual maximum pressure (PSIG) during fracturin

Has the hydraulic fracturing fluid disclosure been No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)	
1	Other	PERFORATIONS	7332	7576

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
CAPROCK - DISPOSAL	No			No	NOT ENCOUNTERED
SPINDLETOP SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
FANNETT SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
BIG HILL SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
PLEISTOCENE-LISSIE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
MIOCENE - DISPOSAL	Yes	3469.0	3469.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6424.0	6424.0	Yes	LOGGED, PERFORATIONS IN THE LOWER FRIO SAND FROM 7,331.5'-7,985.5'
MARINULINA - DISPOSAL	Yes	6038.5	6039.0	Yes	LOGGED
HETEROSTEGINA - DISPOSAL	Yes	6182.0	6182.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS PERFORATED AND SHUT IN. THIS WELL HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

CASING RECORD :

NONE.

TUBING RECORD:

PRODUCING/INJECTION/DISPOSAL INTERVAL :

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION

Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	02/10/2025

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: Exxon Mobil low Carbon solutions	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson	
Well No.: 3	API No.: 42-245-32912	Drilling Permit No.: 898450
Lease Name: Bead Farm	Lease No.:	
Field Name: Wild Cat	Field No.:	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☒ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 17 1/2	Depth of drilled hole (ft.): 2170	Est. % wash-out or hole enlargement: 20%
Size of casing in O.D. (in.): 13 3/8	Casing weight (lbs/ft) and grade: 68# J55	No. of centralizers used: 18
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 2,155	Top of liner (ft.):
		Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date: 08/07/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	705	A		1660	2390
2	385	XH		491	653
3					
Total	1090			2151	3043

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date: 07/04/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1		H			
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXONMOBIL BEAD FARM CO #3 SO#0909508176 SLURRY #1 ECONOCEM SLURRY #2 HALCEM

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

MOHAMED MOUNIR MEKAKDA	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	08/07/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James Harvey	Operations Sup		
Typed or printed name of operator's representative	Title	Signature	
22777 Springwoods Village Spring Tx 77389	512	949 8272	8/8/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name:	Byrd	Operator P-5 No.:	
Cementer Name:	CUDD Pumping Services	Cementer P-5 No.:	191917

WELL INFORMATION

District No.:		County:	Atacosa		
Well No.:	Bead Farm Co #3	API No.:		Drilling Permit No.:	
Lease Name:	Bead Farm Co #3	Lease No.:			
Field Name:		Field No.:			

I. CASING CEMENTING DATA

Type of casing: [x] Conductor [ ] Surface [ ] Intermediate [ ] Liner [ ] Production

Drilled hole size (in.): 26	Depth of drilled hole (ft.): 120	Est. % wash-out or hole enlargement: 30	
Size of casing in O.D. (in.): 20	Casing weight (lbs/ft) and grade: 78.6 ppf X-52 Welded)	No. of centralizers used:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [x] YES [ ] NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 120	Top of liner (ft.):	
		Setting depth liner (ft.):	
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date:	7.26.24

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	230	A	See remarks	274	182
2					
3					
4	230			274	182

II. CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement shoe [ ] Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:	
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:	
Tapered string drilled hole size (in.) Upper: Lower:		Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] YES [ ] NO		Setting depth shoe (ft.):	
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement/DV tool [ ] Multiple parallel strings

Drilled hole size	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:	
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:	
Tapered string drilled hole size (in.) Upper: Lower:		Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] YES [ ] NO		Setting depth tool (ft.):	
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date				-	-	-	-
Size of hole of pipe (in.)	-	-	-	-	-	-	-
Depth to bottom of tubing or drill pipe (ft.)	-	-	-	-	-	-	-
Cement retainer setting depth (ft.)	-	-	-	-	-	-	-
CIBP setting depth (ft.)	-	-	-	-	-	-	-
Amount of cement on top of CIBP (ft.)	-	-	-	-	-	-	-
Sacks of cement used				-	-	-	-
Slurry volume pumped (cu. ft.)				-	-	-	-
Calculated top of plug (ft.)				-	-	-	-
Measured top of plug, if tagged (ft.)			-	-	-	-	-
Slurry weight (lbs/gal)				-	-	-	-
Class/type of cement				-	-	-	-
Perforate and squeeze (YES/NO)	-	-	-	-	-	-	-

REMARKS

1 **Tail-100% Cl A + 1% SA001**
2
3
4

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

Scott Womelsdorf	Service Supervisor	CUDD Pumping Services	Scott Womelsdorf
Name and title of cementer's representative		Cementing Company	Signature

1434 CR 422	Pleasanton	TX	78064	(830)-254-4200	7.26.24
Address	City,	State, Zip Code		Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that the data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

MICHAEL MATHIS	WELL OPERATIONS SUPERVISOR	
Typed or printed name of operator's representative	Title	Signature

				(512) 949-8292	7/26/2024
Address	City,	State, Zip Code		Tel: Area Code Number	Date

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

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C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

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D. **Estimated % wash-out:** If the estimated % wash-outis less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: ExxonMobil Low Carbon Solution	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 03	County: Jefferson	
Well No.: 3	API No.: 42-245-32912	Drilling Permit No.: 898450
Lease Name: Bead Farm	Lease No.:	
Field Name: Wildcat	Field No.:	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☒ Production

Drilled hole size (in.): 12-1/4"	Depth of drilled hole (ft.): 8565'	Est. % wash-out or hole enlargement: 17%
Size of casing in O.D. (in.): 9-5/8"	Casing weight (lbs/ft) and grade: 47.5/53ppf L80/13Cr/25Cr	No. of centralizers used: 170
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 8548'	Top of liner (ft.): / Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date: 8-27-2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	725	H	N/A	1323	691
2	1290	H	N/A	2492	7732
3					
Total	2015			3815	8423

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXONMOBILE, BEAD FARM, #3, PRODUCTION

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JEROD HACK, SERVICE SUPERVISOR	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	08-27-2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

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MICHAEL MATHIS	WELLS OPERATIONS SUPERVISOR	
Typed or printed name of operator's representative	Title	Signature
		08-27-2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

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D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON | Sperry Drilling

DGR / EWR-P4 / DIR

Powered by INSITE™

1 : 500

MD Phase Attenuation Log

Country : USA
Field : WILDCAT
Location : Lat: 30° 0' 42.40" North Long: 94° 17' 52.29" West
Well : BEAD FARM 3
Company : EXXONMOBIL LOW C SOL ON STOR LL
Rig : NABORS X33

Company	:	EXXONMOBIL LOW C SOL ON STOR LL
Rig	:	NABORS X33
Well	:	BEAD FARM 3
Field	:	WILDCAT
Country	:	USA
API Number	:	4224532912

LOCATION

Latitude : 30° 0' 42.40" North
Longitude : 94° 17' 52.29" West

UTM X = 3,456,312.030 usft
UTM Y = 13,945,353.690 usft

Other Services

Permanent Datum : Ground Level
Elevation : 27.00 ft
Log Measured From : Drill Floor
32.52 ft Above Permanent Datum
Drilling Measured From : Drill Floor

MD LOG

Elev. KB
DF 59.52 ft
GL 27.00 ft
WD

Depth Logged : 120.00 ft To 8,565.00 ft
Date Logged : 05-Aug-24 To 14-Aug-24
Total Depth MD : 8,565.00 ft TVD : 8,564.26 ft
Spud Date : 05-Aug-24

Unit No. : N/A
Job No. : LF-XX-0909035053
Plot Type : Final
Plot Date : 10-Sep-24

Run No.	Borehole Record (MD)			Size	Casing Record (MD)		
	Size	From	To		Weight	From	To
100	17.500 in	120.00 ft	2,170.00 ft	20.000 in	146.64 lbpf	SURFACE	120.00 ft
200	12.250 in	2,170.00 ft	3,333.00 ft	13.375 in	66.10 lbpf	SURFACE	2,155.00 ft
201	12.250 in	3,333.00 ft	3,394.00 ft				
300	12.250 in	3,394.00 ft	3,503.00 ft				
301	12.250 in	3,503.00 ft	3,515.00 ft				
302	12.250 in	3,515.00 ft	3,572.00 ft				
400	12.250 in	3,572.00 ft	7,770.00 ft				
401	12.250 in	7,770.00 ft	7,815.00 ft				
500	12.250 in	7,815.00 ft	8,565.00 ft				

WELL INFORMATION

MWD Run Number	100	200	300	400	500
Date run completed	06-Aug-24	09-Aug-24	10-Aug-24	12-Aug-24	15-Aug-24
Rig Bit Number	100	200	300	400	500
Bit Size (in)	17.500	12.250	12.250	12.250	12.250
Tool Nominal OD (in)	8.000	8.000	8.000	8.000	8.000
Log Start Depth (MD, ft)	120.00	2,170.00	3,394.00	3,572.00	7,815.00
Log End Depth (MD, ft)	2,170.00	3,333.00	3,503.00	7,770.00	8,565.00
Drill or Wipe	Drill	Drill	Drill and Wipe	Drill and Wipe	Drill and Wipe
Drill/Wipe Start Date and Time	05-Aug-24 23:00	08-Aug-24 17:40	10-Aug-24 02:03	11-Aug-24 13:09	14-Aug-24 08:26
Drill/Wipe End Date and Time	06-Aug-24 11:10	09-Aug-24 03:17	10-Aug-24 04:37	12-Aug-24 13:50	14-Aug-24 08:26
Min Inc (deg) @ Depth (MD, ft)	0.13 @ 317.00	0.67 @ 3,304.00	0.92 @ 3,471.00	0.13 @ 7,374.00	0.13 @ 7,754.00
Max Inc (deg) @ Depth (MD, ft)	0.92 @ 2,002.00	1.00 @ 2,568.00	0.98 @ 3,411.00	2.27 @ 3,693.00	0.75 @ 7,949.00
Bit TFA(in2) / Bit Type	1.23 / GT65s	1.23 / HD65s	1.23 / HD65s	1.23 / HD65s	1.23 / HD65s
Flow Rate (gpm)	700.00	750.00	750.00	740.00	689.00
Max AV (fpm) / CV (fpm) @ MWD	80.0 / 46.0	54.0 / 35.0	43.0 / 32.0	45.0 / 32.0	43.0 / 38.0
Fluid Type	Native/Spud Mud	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base
Density (ppg) / Viscosity (spqt)	9.20 / 34.00	10.35 / 74.00	10.35 / 68.00	10.40 / 65.00	10.40 / 65.00
Filtrate CL (ppm)	1,300.00	61,000.00	64,000.00	66,000.00	60,000.00
pH / API Filtrate (mptm)	8.00 / 8	N/A / 12	N/A / 0	N/A / 0	N/A / 0
PV (cP) / YP (lhf2)	4 / 3.00	24 / 32.00	23 / 21.00	21 / 24.00	16 / 18.00
% Solids / % Sand	4.9 / 0	10.2 / 0	11 / 0	11.4 / .1	11.7 / 0
% Oil / Oil:Water Ratio	0 / 0:100	54 / 62:38	52 / 60:40	55.5 / 65:35	58.5 / 68:32
Rm @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmf @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Max Tool Temp (degF) / Source	127.29 / HCIM	152.00 / HCIM	130.82 / HCIM	173.18 / HCIM	169.65 / HCIM
Rm @ Max Tool Temp (degF)	N/A @ 127.29	N/A @ 152.00	N/A @ 130.82	N/A @ 173.18	N/A @ 169.65
Lead MWD Engineer	Nathan Lakin	Nathan Lakin	Nathan Lakin	Nathan Lakin	Nathan Lakin
Customer Representative	N/A	N/A	N/A	N/A	N/A

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM	HCIM	HCIM	HCIM
Software Version	98.43	98.43	98.43	98.43	98.43
Sub Serial Number	11432374	11432374	11432374	11432374	11432374
Insert Serial Number	11753209	11753209	11753209	11753209	11753209
Date and Time Initialized	05-Aug-24 19:34	08-Aug-24 10:27	09-Aug-24 22:54	11-Aug-24 06:34	13-Aug-24 21:15
Date and Time Read	07-Aug-24 01:00	09-Aug-24 07:20	12-Aug-24 14:30	12-Aug-24 23:30	14-Aug-24 20:45
ECMB SW Version	N/A	N/A	N/A	N/A	N/A

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	PCDC
Distance From Bit (ft)	36.08	26.50	26.50	66.33	66.72
Software Version	6.43	6.43	6.43	6.43	6.43
Sub Serial Number	10435619	10435619	10435619	10435619	10435619
Sonde Serial Number	13008879	13008879	13008879	13008879	13008879
Sensor ID Number	N/A	N/A	N/A	N/A	N/A
Toolface Offset (deg)	0.00	0.00	0.00	54.00	276.00

Gamma Ray Sensor Information

Tool Type	DGR	DGR	DGR	DGR	DGR
Distance From Bit (ft)	25.64	16.06	16.06	55.82	56.28
Recorded Sample Period (sec)	4	4	4	4	4
Software Version	N/A	N/A	N/A	N/A	N/A
Sub Serial Number	11654485	11654485	11654485	11654485	11654485
Insert/Sonde Serial Number	11671533	11671533	11671533	11671533	11671533

Resistivity Sensor Information

Tool Type	EWR-P4				
Distance From Bit (ft)	11.55				
Recorded Sample Period (sec)	4				
Software Version	1.51				
Sub Serial Number	10673350				
Receiver Insert Serial Number	11827847				
Transmitter Insert Serial Number	11707807				
Receiver Orientation	Down				

REMARKS

All depths are referenced to the driller's pipe tally.

DGXT - Gamma Ray formation exposure time
EWXT - Resistivity formation exposure time

Default 1:500 Log Smoothing:
Interval Resolution: 0.5ft
Window Interval:(+/-) 0.6ft
Gap Fill: 3.0ft

Archive Name: BEAD_FARM_3_500MD_PHASE_ATTEN_120_8565

Plot Width: 8.25 in

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division

ELECTRIC LOG STATUS REPORT

FORM L-1

Tracking No.: 326180

This facsimile L-1 was generated electronically from data submitted to the RRC.

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 10/18/2024
Field Name WILDCAT	Drilling Permit No. 898450	
Lease Name BEAD FARM	Lease/ID No. 28200	Well No. 3
County JEFFERSON	API No. 42- 245-32912	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

Lease or ID No(s). _____

Well No(s). _____

Josh Calkin
Signature

Title

EXXONMOBIL LOW C SOL ON STOR LLC
Name (print)

(281) 702-5537
Phone

12/18/2024
Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Kristen Killen,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **August 5, 2024 to August 14, 2024** conduct or supervise the taking of Directional Surveys as follow:

- **317' to a depth of 8497' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8565'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **BEAD FARM 3** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Kristen Killen, Log Analyst

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON
4607 HWY 90 EAST • BROUSSARD, LA 70518
PHONE 337 837 3061 • FAX 337 837 4400

September 9, 2024

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
BEAD FARM 3
Permit No. 898450
Jefferson County, TX
API # 42-245-32912

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Kristen Killen, Log Analyst
Drainhole Number	-	Original
Surveyed Depths	-	317' – 8497' MWD Surveys performed by Sperry Drilling
Dates Performed	-	August 5, 2024 to August 14, 2024
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,

Kristen Killen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 909035053

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx_NAD83
Rose Prospect CCS
Bead Farm #3

003 ST00BP00

Design: 003 ST00BP00

Sperry Drilling Services

Geodetic Report

22 August, 2024

Well Coordinates: 13,945,353.69 N, 3,456,312.03 E (30° 00' 42.40" N, 094° 17' 52.29" W)
Ground Level: 27.00 usft

Local Coordinate Origin:	Centered on Well Bead Farm #3
Viewing Datum:	(32.52') Nabors X-33 @ 59.52usft (Plan)
TVDs to System:	N
North Reference:	Grid
Unit System:	API US Survey Feet

Version: 5000.17 Build: 02

HALLIBURTON

Design Report for Bead Farm #3 - 003 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	30° 0' 42.403 N	94° 17' 52.286 W	13,945,353.69	3,456,312.03
317.00	0.13	105.78	317.00	-0.10	0.35	30° 0' 42.402 N	94° 17' 52.282 W	13,945,353.59	3,456,312.38
405.00	0.48	59.26	405.00	0.06	0.76	30° 0' 42.403 N	94° 17' 52.277 W	13,945,353.75	3,456,312.79
499.00	0.31	43.43	499.00	0.45	1.27	30° 0' 42.407 N	94° 17' 52.271 W	13,945,354.14	3,456,313.30
593.00	0.18	41.92	593.00	0.74	1.55	30° 0' 42.410 N	94° 17' 52.268 W	13,945,354.43	3,456,313.58
685.00	0.22	50.85	684.99	0.96	1.78	30° 0' 42.412 N	94° 17' 52.265 W	13,945,354.65	3,456,313.81
768.00	0.25	41.72	767.99	1.20	2.02	30° 0' 42.414 N	94° 17' 52.262 W	13,945,354.89	3,456,314.05
865.00	0.18	5.76	864.99	1.51	2.18	30° 0' 42.417 N	94° 17' 52.260 W	13,945,355.20	3,456,314.21
963.00	0.25	336.43	962.99	1.86	2.11	30° 0' 42.421 N	94° 17' 52.261 W	13,945,355.55	3,456,314.14
1,060.00	0.45	349.02	1,059.99	2.43	1.95	30° 0' 42.426 N	94° 17' 52.262 W	13,945,356.12	3,456,313.98
1,157.00	0.39	36.90	1,156.99	3.06	2.08	30° 0' 42.433 N	94° 17' 52.261 W	13,945,356.75	3,456,314.11
1,247.00	0.76	43.05	1,246.98	3.74	2.67	30° 0' 42.439 N	94° 17' 52.254 W	13,945,357.43	3,456,314.70
1,338.00	0.50	80.63	1,337.98	4.25	3.47	30° 0' 42.444 N	94° 17' 52.244 W	13,945,357.94	3,456,315.50
1,436.00	0.38	73.99	1,435.98	4.41	4.21	30° 0' 42.445 N	94° 17' 52.236 W	13,945,358.10	3,456,316.24
1,527.00	0.56	41.34	1,526.97	4.83	4.79	30° 0' 42.449 N	94° 17' 52.229 W	13,945,358.52	3,456,316.82
1,623.00	0.14	230.38	1,622.97	5.10	5.01	30° 0' 42.452 N	94° 17' 52.227 W	13,945,358.79	3,456,317.04
1,720.00	0.88	240.64	1,719.97	4.66	4.27	30° 0' 42.447 N	94° 17' 52.235 W	13,945,358.35	3,456,316.30
1,815.00	0.90	236.11	1,814.96	3.89	3.01	30° 0' 42.440 N	94° 17' 52.250 W	13,945,357.58	3,456,315.05
1,908.00	0.86	241.23	1,907.94	3.15	1.80	30° 0' 42.433 N	94° 17' 52.264 W	13,945,356.84	3,456,313.83
2,002.00	0.92	198.67	2,001.93	2.09	0.94	30° 0' 42.423 N	94° 17' 52.274 W	13,945,355.78	3,456,312.97
2,095.00	0.78	198.22	2,094.92	0.78	0.50	30° 0' 42.411 N	94° 17' 52.280 W	13,945,354.47	3,456,312.53
2,132.00	0.86	199.33	2,131.92	0.28	0.33	30° 0' 42.406 N	94° 17' 52.282 W	13,945,353.97	3,456,312.36
2,181.00	0.97	198.19	2,180.91	-0.46	0.08	30° 0' 42.398 N	94° 17' 52.285 W	13,945,353.23	3,456,312.11
2,278.00	0.94	195.43	2,277.90	-2.01	-0.39	30° 0' 42.383 N	94° 17' 52.291 W	13,945,351.68	3,456,311.64
2,374.00	0.96	190.75	2,373.89	-3.56	-0.75	30° 0' 42.368 N	94° 17' 52.296 W	13,945,350.13	3,456,311.28
2,472.00	0.97	201.76	2,471.87	-5.13	-1.21	30° 0' 42.353 N	94° 17' 52.302 W	13,945,348.56	3,456,310.82
2,568.00	1.00	206.11	2,567.86	-6.64	-1.88	30° 0' 42.338 N	94° 17' 52.310 W	13,945,347.05	3,456,310.15
2,663.00	0.89	206.72	2,662.85	-8.04	-2.58	30° 0' 42.325 N	94° 17' 52.319 W	13,945,345.65	3,456,309.45
2,755.00	0.79	205.85	2,754.84	-9.25	-3.17	30° 0' 42.313 N	94° 17' 52.326 W	13,945,344.44	3,456,308.86
2,847.00	0.75	212.30	2,846.83	-10.33	-3.77	30° 0' 42.302 N	94° 17' 52.333 W	13,945,343.36	3,456,308.26
2,940.00	0.81	208.77	2,939.82	-11.42	-4.41	30° 0' 42.292 N	94° 17' 52.341 W	13,945,342.27	3,456,307.62
3,036.00	0.75	206.15	3,035.81	-12.58	-5.02	30° 0' 42.281 N	94° 17' 52.349 W	13,945,341.11	3,456,307.01
3,133.00	0.81	204.76	3,132.80	-13.77	-5.58	30° 0' 42.269 N	94° 17' 52.356 W	13,945,339.92	3,456,306.45
3,228.00	0.73	204.84	3,227.79	-14.93	-6.12	30° 0' 42.258 N	94° 17' 52.362 W	13,945,338.76	3,456,305.91
3,304.00	0.67	204.58	3,303.79	-15.78	-6.51	30° 0' 42.250 N	94° 17' 52.367 W	13,945,337.91	3,456,305.52
3,411.00	0.98	231.56	3,410.78	-16.91	-7.49	30° 0' 42.239 N	94° 17' 52.379 W	13,945,336.78	3,456,304.54
3,456.95	0.93	232.86	3,456.72	-17.38	-8.09	30° 0' 42.234 N	94° 17' 52.386 W	13,945,336.31	3,456,303.94
3,471.00	0.92	233.29	3,470.77	-17.52	-8.27	30° 0' 42.233 N	94° 17' 52.388 W	13,945,336.17	3,456,303.76
3,693.00	2.27	232.20	3,692.68	-21.28	-13.18	30° 0' 42.198 N	94° 17' 52.445 W	13,945,332.41	3,456,298.85
3,790.00	2.13	234.46	3,789.61	-23.51	-16.16	30° 0' 42.177 N	94° 17' 52.480 W	13,945,330.18	3,456,295.87
3,877.00	2.10	229.32	3,876.55	-25.48	-18.69	30° 0' 42.158 N	94° 17' 52.510 W	13,945,328.21	3,456,293.34
3,973.00	1.87	229.17	3,972.49	-27.66	-21.20	30° 0' 42.138 N	94° 17' 52.539 W	13,945,326.03	3,456,290.83

Design Report for Bead Farm #3 - 003 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
4,069.00	1.58	227.05	4,068.45	-29.58	-23.36	30° 0' 42.120 N	94° 17' 52.565 W	13,945,324.11	3,456,288.67
4,166.00	1.18	229.82	4,165.42	-31.14	-25.10	30° 0' 42.105 N	94° 17' 52.585 W	13,945,322.55	3,456,286.93
4,260.00	1.13	222.08	4,259.40	-32.45	-26.46	30° 0' 42.093 N	94° 17' 52.601 W	13,945,321.24	3,456,285.57
4,355.00	1.30	218.12	4,354.38	-33.99	-27.75	30° 0' 42.078 N	94° 17' 52.617 W	13,945,319.70	3,456,284.28
4,545.00	0.88	214.41	4,544.34	-36.89	-29.91	30° 0' 42.050 N	94° 17' 52.643 W	13,945,316.80	3,456,282.12
4,642.00	0.63	222.34	4,641.33	-37.90	-30.69	30° 0' 42.040 N	94° 17' 52.652 W	13,945,315.79	3,456,281.34
4,825.00	0.44	231.95	4,824.33	-39.08	-31.92	30° 0' 42.029 N	94° 17' 52.666 W	13,945,314.61	3,456,280.11
5,018.00	0.36	262.36	5,017.32	-39.61	-33.10	30° 0' 42.024 N	94° 17' 52.680 W	13,945,314.08	3,456,278.93
5,105.00	0.25	225.32	5,104.32	-39.78	-33.51	30° 0' 42.023 N	94° 17' 52.685 W	13,945,313.91	3,456,278.52
5,200.00	0.39	177.91	5,199.32	-40.25	-33.65	30° 0' 42.018 N	94° 17' 52.687 W	13,945,313.44	3,456,278.38
5,391.00	0.31	182.05	5,390.31	-41.42	-33.64	30° 0' 42.007 N	94° 17' 52.687 W	13,945,312.27	3,456,278.39
5,486.00	0.31	169.41	5,485.31	-41.93	-33.60	30° 0' 42.002 N	94° 17' 52.687 W	13,945,311.76	3,456,278.43
5,579.00	0.25	115.14	5,578.31	-42.26	-33.37	30° 0' 41.998 N	94° 17' 52.684 W	13,945,311.43	3,456,278.66
5,675.00	0.19	109.32	5,674.31	-42.40	-33.03	30° 0' 41.997 N	94° 17' 52.681 W	13,945,311.29	3,456,279.00
5,771.00	0.26	142.20	5,770.31	-42.63	-32.75	30° 0' 41.994 N	94° 17' 52.677 W	13,945,311.06	3,456,279.28
5,867.00	0.18	75.89	5,866.31	-42.76	-32.47	30° 0' 41.993 N	94° 17' 52.674 W	13,945,310.93	3,456,279.56
6,047.00	0.14	37.10	6,046.31	-42.52	-32.06	30° 0' 41.995 N	94° 17' 52.670 W	13,945,311.17	3,456,279.97
6,238.00	0.42	17.33	6,237.31	-41.66	-31.71	30° 0' 42.004 N	94° 17' 52.665 W	13,945,312.03	3,456,280.32
6,335.00	0.25	355.92	6,334.31	-41.11	-31.62	30° 0' 42.009 N	94° 17' 52.664 W	13,945,312.58	3,456,280.41
6,430.00	0.25	355.77	6,429.30	-40.70	-31.65	30° 0' 42.013 N	94° 17' 52.664 W	13,945,312.99	3,456,280.38
6,525.00	0.26	299.85	6,524.30	-40.39	-31.85	30° 0' 42.016 N	94° 17' 52.666 W	13,945,313.30	3,456,280.18
6,619.00	0.25	289.02	6,618.30	-40.21	-32.23	30° 0' 42.018 N	94° 17' 52.671 W	13,945,313.48	3,456,279.80
6,809.00	0.40	280.55	6,808.30	-39.96	-33.28	30° 0' 42.021 N	94° 17' 52.682 W	13,945,313.73	3,456,278.75
6,998.00	0.28	240.88	6,997.30	-40.06	-34.33	30° 0' 42.020 N	94° 17' 52.694 W	13,945,313.63	3,456,277.70
7,185.00	0.18	170.15	7,184.30	-40.57	-34.68	30° 0' 42.016 N	94° 17' 52.698 W	13,945,313.12	3,456,277.35
7,282.00	0.25	146.16	7,281.29	-40.90	-34.53	30° 0' 42.012 N	94° 17' 52.697 W	13,945,312.79	3,456,277.50
7,374.00	0.13	148.56	7,373.29	-41.15	-34.37	30° 0' 42.010 N	94° 17' 52.695 W	13,945,312.54	3,456,277.66
7,471.00	0.26	192.80	7,470.29	-41.46	-34.36	30° 0' 42.007 N	94° 17' 52.695 W	13,945,312.23	3,456,277.67
7,563.00	0.38	181.88	7,562.29	-41.97	-34.42	30° 0' 42.002 N	94° 17' 52.696 W	13,945,311.72	3,456,277.61
7,658.00	0.19	175.36	7,657.29	-42.44	-34.41	30° 0' 41.997 N	94° 17' 52.696 W	13,945,311.25	3,456,277.62
7,754.00	0.13	208.60	7,753.29	-42.70	-34.45	30° 0' 41.994 N	94° 17' 52.697 W	13,945,310.99	3,456,277.58
7,850.00	0.53	265.40	7,849.29	-42.83	-34.95	30° 0' 41.993 N	94° 17' 52.703 W	13,945,310.86	3,456,277.08
7,949.00	0.75	264.57	7,948.28	-42.93	-36.05	30° 0' 41.993 N	94° 17' 52.715 W	13,945,310.76	3,456,275.98
8,135.00	0.62	255.66	8,134.27	-43.29	-38.24	30° 0' 41.990 N	94° 17' 52.740 W	13,945,310.40	3,456,273.79
8,321.00	0.38	253.90	8,320.26	-43.71	-39.80	30° 0' 41.987 N	94° 17' 52.758 W	13,945,309.98	3,456,272.23
8,416.00	0.19	261.71	8,415.26	-43.82	-40.26	30° 0' 41.986 N	94° 17' 52.763 W	13,945,309.87	3,456,271.77
8,497.00	0.32	247.32	8,496.26	-43.93	-40.60	30° 0' 41.985 N	94° 17' 52.767 W	13,945,309.76	3,456,271.43
8,565.00	0.32	247.32	8,564.26	-44.08	-40.95	30° 0' 41.983 N	94° 17' 52.771 W	13,945,309.61	3,456,271.08

Design Report for Bead Farm #3 - 003 ST00BP00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,565.00	8,564.26	-44.08	-40.95	Proj. to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
317.00	2,132.00	01 HAL MWD (MagVarMS) 17 1/2" Hole 317' - 2132'	3_MWD+HRGM+MS
2,181.00	8,497.00	02 HAL MWD (MagVarMS) 12 1/4" Hole 2181' - 8497'	3_MWD+HRGM+MS

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
152.50	152.50	20" Conductor Casing	20	20
2,155.00	2,154.92	13-3/8" Surface Casing	13-3/8	17-1/2
8,548.48	8,547.74	9-5/8" Production Casing	9-5/8	12-1/4

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated

Design Report for Bead Farm #3 - 003 ST00BP00

Directional Difficulty Index

Average Dogleg over Survey:	0.19 °/100usft	Maximum Dogleg over Survey:	0.77 °/100usft at 1,720.00 usft
Net Tortousity applicable to Plans:	0.19 °/100usft	Directional Difficulty Index:	3.170

Audit Info

North Reference Sheet for Rose Prospect CCS - Bead Farm #3 - 003 ST00BP00

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 59.52usft (Plan). Northing and Easting are relative to Bead Farm #3

Coordinate System is US State Plane 1983, Texas South Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 1,968,500.00usft, False Northing: 13,123,333.33usft, Scale Reduction: 0.99993284

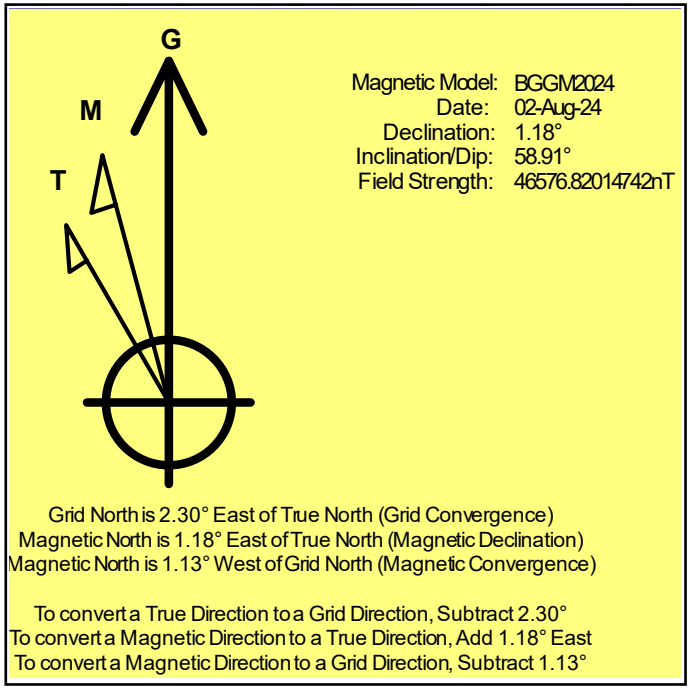
Grid Coordinates of Well: 13,945,353.69 usft N, 3,456,312.03 usft E

Geographical Coordinates of Well: 30° 00' 42.40" N, 094° 17' 52.29" W

Grid Convergence at Surface is: 2.30°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,565.00usft

the Bottom Hole Displacement is 60.17usft in the Direction of 222.90° (Grid).
Magnetic Convergence at surface is: 1.13° (2 August 2024, , BGGM2024)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898450	Apr 17, 2024	* 03
API NUMBER	FORM W-1 RECEIVED	COUNTY
42-245-32912	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	WELLBORE PROFILE(S)	ACRES
NEW DRILL	Vertical	650

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE
This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.
District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM	3
LOCATION	TOTAL DEPTH
3.35 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 8 BLOCK ABSTRACT 658

SURVEY HT&B RR CO/TURNER, D C

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1742 ft. WEST 2937 ft. NORTH	ft.
DISTANCE TO LEASE LINES	DISTANCE TO NEAREST WELL ON LEASE
1742 ft. WEST 2937 ft. NORTH	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	650.00	8,600	3	03
BEAD FARM			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
BEAD FARM #3
D.C. TURNER SURVEY, A-658
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759

G.M. EAST SURVEY
A-823

H.T. & B. R.R. CO. SURVEY
A-150

BHL: ST00
MD: 8497.00
TVD: 8496.26
From Surf Location:
41.985 N
52.767 W

2937' Sc.

D.C. TURNER SURVEY
A-658

GRID N

SPERRY DRILLING JOB NO. 909035053
DATE SURVEYED August 14, 2024
SURVEYED FROM 317' TO 8497'
TIE-ON COORDINATES FROM Surface
BHL AT 8565.00 FT. (MD) = 60.17 FT.
AT 222.90° * Grid
FROM SURFACE LOCATION NW
BHL ____ = TO NW LEASE LINE

1742' Sc.

BEAD FARM #3
Y=13,945,353.69'
X=3,456,312.03'
LAT.=30°00'42.40"
LONG.=-94°17'52.29"

H.T. & B. R.R. CO. SURVEY
A-149

T.& N.O. R.R. CO. SURVEY
A-142

Bead Farm Co.
Vol. 879, Pg. 564
D.R.J.C.T.

T.& N.O. R.R. CO. SURVEY
A-694

W.L. CLARK SURVEY
A-874

T.& N.O. R.R. CO. SURVEY
A-266

T.& N.O. R.R. CO. SURVEY
A-869

SHL	TRACT CALLS	SURVEY CALLS	ELEV.
BEAD FARM #3	2937' Sc. FNL 1742' Sc. FWL	2937' Sc. FNL 1742' Sc. FWL	23.0'

STATE OF TEXAS
REGISTERED
JIM G. GLASS
5262
PROFESSIONAL
LAND SURVEYOR

Location is approximately
10.8 miles SW of Beaumont, Tx.
"CHINA" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 2.8 miles turn right (North) on Green Pond Gully Road Go 0.8 miles. Turn Left (Northwest). Drive on location.

DATE SURVEYED: 8/23/2023-8/28/2023

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data and tract acreages shown hereon were furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS - - - COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: April 9, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: ECJ FB 2744/88-97 Job No. 430923 Map No. J-0923-LOC-INJ3C

CONFIDENTIAL BUSINESS INFORMATION

CHRISTI CRADDICK, CHAIRMAN
WAYNE CHRISTIAN, COMMISSIONER
JIM WRIGHT, COMMISSIONER

DANNY SORRELLS
DIRECTOR, OIL AND GAS DIVISION
PETER FISHER, P.G.
DISTRICT DIRECTOR

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

OPERATOR Name:	EXXONMOBIL LOW C SOL ON	**RE:**	**Lease:**	Bead Farm Co.
Address1:	ATTN EDWARD E GRAHAM W1.2B.02			
Address2:	22777 SPRINGWOODS VILLAGE PKWY	**Well No:**	3	
City:	SPRING	**Sec:**	8	**Block:**
State:	TX	**County:**	JEFFERSON	
		Survey Name:	HT&B RR CO/TURNER, D C	

SWR13EX Application Number: 130364 **Drilling Permit No:**

SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for **LEASE** Bead Farm Co. ;
WELL 3 has been approved by the Railroad Commission of Texas District Office.

a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.

b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.

c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.

d. The casing and cement program shall adhere to the following specifications:

Set 2170 feet of surface casing and circulate cement from the shoe to the ground surface.

DP 898450 - Exxonmobil, Bead Farm Co. Lease Well 3 (245 32912)

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted 05/20/2024 .
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: AUDREY KUKLENZ DATE: 05/20/2024

PETER FISHER, P.G.

DISTRICT DIRECTOR

CONFIDENTIAL BUSINESS INFORMATION

4224532908 Bead Farm Co. #1 (Stratigraphic Well and Above-Zone Monitoring Well)

CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32908
Drilling Permit # 891726
SWR Exception Case/Docket No.

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256
2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC
3. Operator Address (include street, city, state, zip): ATTN EDWARD E GRAHAM W1.2B.02, 22777 SPRINGWOODS VILLAGE PKWY, SPRING, TX 77389
4. Lease Name: BEAD FARM CO.
5. Well No.: 1

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 8700

9. Do you have the right to develop the minerals under any right-of-way ? [X] Yes [ ] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03
12. County: JEFFERSON
13. Surface Location: [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 18 miles in a E direction from Cleveland which is the nearest town in the county of the well site.

15. Section: 41
16. Block:
17. Survey: T&NO RR CO
18. Abstract No.: A-266
19. Distance to nearest lease line: ft.
20. Number of contiguous acres in lease, pooled unit, or unitized tract: 642.2

21. Lease Perpendiculars: 1475 ft from the N line and 1817 ft from the W line.
22. Survey Perpendiculars: 1475 ft from the N line and 1817 ft from the W line.

23. Is this a pooled unit? [ ] Yes [X] No
24. Unitization Docket No:
25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION — List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	8495	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks
See W1 Comments attached

Certificate:
I certify that information stated in this application is true and complete, to the best of my knowledge.

Leslie Sincler — Name of filer
Jun 28, 2023 — Date submitted
(832)654-3475 — Phone
leslie@exxonmobil.com — E-mail Address (OPTIONAL)

RRC Use Only Data Validation Time Stamp: Aug 18, 2023 6:27 PM('As Approved' Version)

CONFIDENTIAL BUSINESS INFORMATION

Permit Status: Approved

The RRC has not approved this application. Duplication or distribution of information is at the user's own risk.

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

W-1 Comments

Permit # 891726

Approved Date: Aug 18, 2023

[FILER Jun 28, 2023 2:17 PM]: Proposed well is an exploratory test well. Well completions tests are planned to include up to an estimated 21,000 bbls of salt and water solution. Tests will be completed at three intervals over the course of up to an estimated three weeks.; [RRC STAFF Jun 29, 2023 5:43 PM]: W-1 coordinates changed to match plat.; [RRC STAFF Jun 30, 2023 4:13 PM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Jun 30, 2023 4:14 PM]: W-1 is being held until it is determined if Financial Assurance is needed for carbon capture.; [RRC STAFF Jul 6, 2023 10:40 AM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Aug 17, 2023 2:09 PM]: Financial Assurance has been submitted and is currently being processed. The status is currently Pending, when it updates to Approved, the W-1 can be approved.; [RRC STAFF Aug 18, 2023 6:26 PM]: Financial Assurance has been updated to approved.; [RRC STAFF Aug 18, 2023 6:26 PM]: Problems identified with this permit are resolved.

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	19 June 2023	**GAU Number:**	368887

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	
		County:	JEFFERSON
		Lease Name:	BEAD FARM CO
		Lease Number:	
Operator No.:	101256	**Well Number:**	1
		Total Vertical	8500
		Latitude:	29.999222
		Longitude:	-94.297364
		Datum:	NAD27

Purpose: New Production Well

Location: Survey-T&NO RR CO; Abstract-266; Section-41

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

Usable-quality water occurs from the land surface to a depth of 1100 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

Also, isolation to prevent migration must be effected at a depth of 600 feet.

This recommendation is applicable for all wells drilled in this Lease.

Please send a shallow GR/SP/RES log of this well when it is available.

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 06/15/2023. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

***NOTIFICATION**

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
891726	Aug 18, 2023	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32908	Jun 28, 2023	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	642.2

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM W1.2B.02
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE
This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.
District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM CO.	1
LOCATION	**TOTAL DEPTH**
18 miles E direction from CLEVELAND	8700

Section, Block and/or Survey

SECTION 41 BLOCK ABSTRACT 266

SURVEY T&NO RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1475 ft. N 1817 ft. W	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
1475 ft. N 1817 ft. W	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	642.20	8,495	1	03
BEAD FARM CO.			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

Form W-1: Review

Status # 891726 **API #** 245-32908	**OP # 101256 - EXXONMOBIL LOW C SOL ON STOR LLC** Approved ,**Issued:** 08/18/2023 ,**Filed:** Online	**BEAD FARM CO. - Well # 1** 03 - JEFFERSON County	**New Drill** Vertical
Problems identified with this permit are (08/18/2023 06:26:52 PM)			

Status:

Back to Public Query Search Results

View Current W-1 | View Current Permit | View SWR 13 Formations

General / Location Information

Basic Information:

Filing Purpose	Welbore Profiles	Lease Name	Well #	SWR	Total Depth	Horizontal Wellbore	Stacked Lateral Parent Well DP #
New Drill	Vertical	BEAD FARM CO.	1		8700		

Surface Location Information:

API #	Distance from Nearest Town	Direction from Nearest Town	Nearest Town	Surface Location Type
245-32908	18.0 miles	E	Cleveland	Land

GPS Coordinates - Datum: NAD 27
Latitude: 29.999222 **Longitude:** -94.297363

Survey/Legal Location Information:

Section	Block	Survey	Abstract #	County
41		T&NO RR CO	266	JEFFERSON

Township	League	Labor	Porcion	Share	Tract	Lot

Perpendicular surface location from two nearest designated reference lines:

Perpendiculars	Distance	Direction	Distance	Direction
Survey Lines	1475.0 feet	from the N line and	1817.0 feet	from the W line

Permit Restrictions:

Code	Description
29	This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

Fields

District	Field Name	Field #	Completion Depth	Lease Name	Well #	Well Type	Acres	Distance to Nearest Well	Distance to Nearest Lease Line from Surface Location	SWR	Pooled/ Unitized
03	**WILDCAT** **Primary Field**	00006001	8495	BEAD FARM CO.	1	Exploratory Test Well	642.2		1475.0		N

Perpendiculars	Distance	Direction	Distance	Direction
Surface Lease Lines	1475.0 feet	from the N line and	1817.0 feet	from the W line

Field Restrictions:

Code	Description
05	For exploratory test only

Comments

Remark	Date Entered	Entered By
Proposed well is an exploratory test well. Well completions tests are planned to include up to an estimated 21,000 bbls of salt and water solution. Tests will be completed at three intervals over the course of up to an estimated three weeks.	06/28/2023 02:17:14 PM	FILER
W-1 coordinates changed to match plat.	06/29/2023 05:43:39 PM	RRC STAFF
There have been problems identified with this permit (see problem letter attachment). Notification sent.	06/30/2023 04:13:51 PM	RRC STAFF
W-1 is being held until it is determined if Financial Assurance is needed for carbon capture.	06/30/2023 04:14:30 PM	RRC STAFF
There have been problems identified with this permit (see problem letter attachment). Notification sent.	07/06/2023 10:40:00 AM	RRC STAFF
Financial Assurance has been submitted and is currently being processed. The status is currently Pending, when it updates to Approved, the W-1 can be approved.	08/17/2023 02:09:11 PM	RRC STAFF

CONFIDENTIAL BUSINESS INFORMATION

Financial Assurance has been updated to approved.	08/18/2023 06:26:41 PM	RRC STAFF
Problems identified with this permit are resolved.	08/18/2023 06:26:52 PM	RRC STAFF

Attachments

Attachment Type	File Path	Associated Fields and/or Plats
As Approved W-1	AsApprovedW1-8-18-2023.pdf	
As Approved Permit	AsApprovedPermit-8-18-2023.pdf	
As Submitted W-1	AsSubmittedW1-6-28-2023.pdf	
Other	GW2 - 368887.pdf	
PLAT #1(**Paper Size : LGL**)	LO_TX245_BEAD_FARM_CO_1_S (1).pdf	WILDCAT
Permit Problem Letter	problem_letter_7-6-2023.pdf	

CONFIDENTIAL BUSINESS INFORMATION

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
481 WINSCOTT ROAD, Ste. 200 • BENBROOK, TEXAS 76126
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
TEXAS FIRM REGISTRATION NO. 10042504
WWW.TOPOGRAPHIC.COM

JEFFERSON COUNTY, TEXAS

SECTION 41, T. & N.O.R.R. CO. SURVEY, A-266

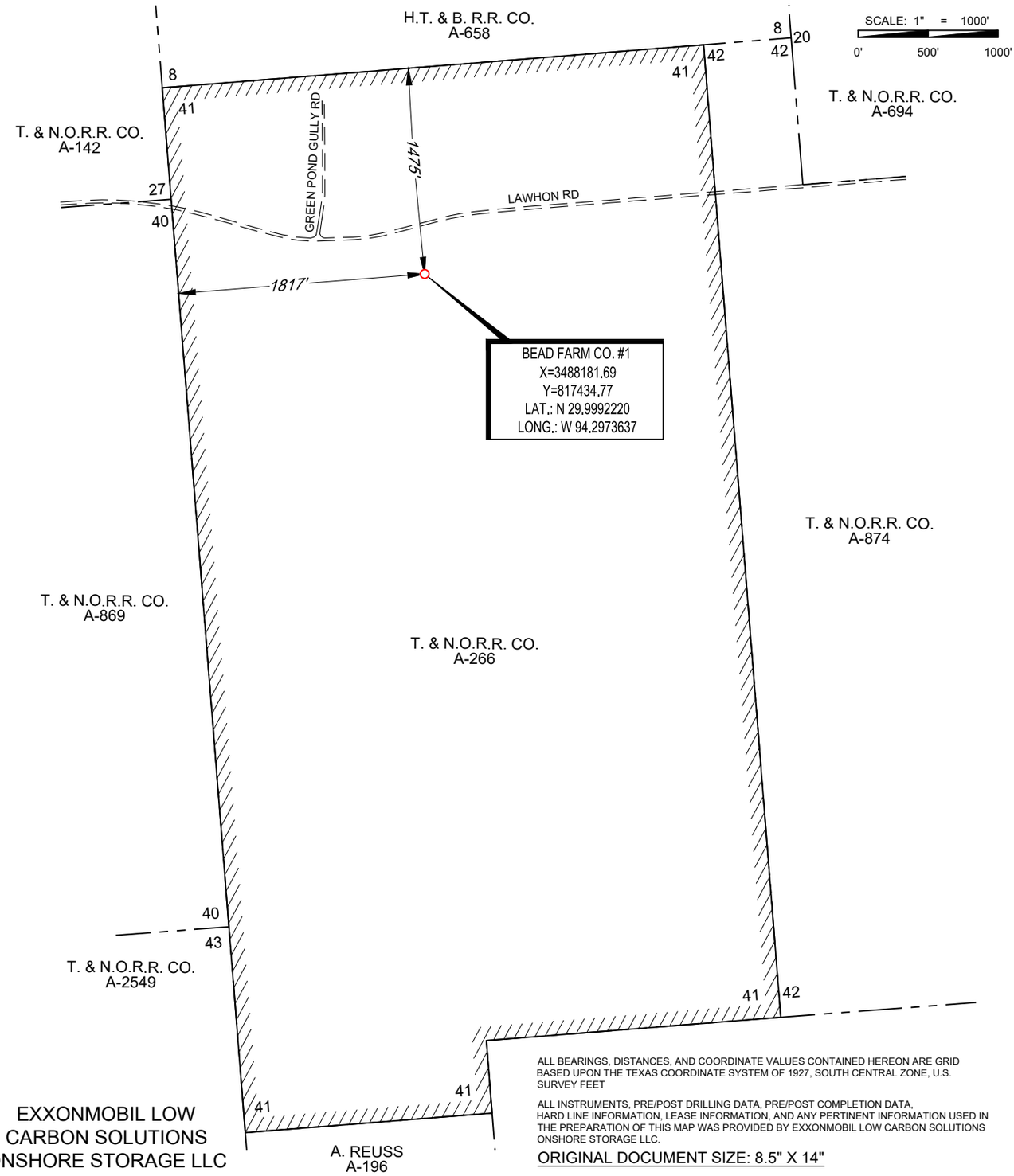
LEGEND

- UNIT/LEASE BOUNDARY
- SECTION LINE
- ROAD
- PROPOSED WELL

UNIT/LEASE		SURVEY
S.H.L.	1817' FWL 1475' FNL	T. & N.O.R.R. CO., A-266 1817' FWL & 1475' FNL

N

SCALE: 1" = 1000'
0' 500' 1000'



EXXONMOBIL LOW CARBON SOLUTIONS ONSHORE STORAGE LLC

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE TEXAS COORDINATE SYSTEM OF 1927, SOUTH CENTRAL ZONE, U.S. SURVEY FEET

ALL INSTRUMENTS, PRE/POST DRILLING DATA, PRE/POST COMPLETION DATA, HARD LINE INFORMATION, LEASE INFORMATION, AND ANY PERTINENT INFORMATION USED IN THE PREPARATION OF THIS MAP WAS PROVIDED BY EXXONMOBIL LOW CARBON SOLUTIONS ONSHORE STORAGE LLC.

ORIGINAL DOCUMENT SIZE: 8.5" X 14"

LEASE NAME & WELL NO.: BEAD FARM CO. #1 LEASE ACREAGE: CALLED 642.2 DATE OF SURVEY: APRIL 21, 2023

LOCATED: ±12 MILES SOUTHWEST OF BEAUMONT, TX GROUND ELEVATION: 23'

BEST ACCESSIBILITY TO LOCATION: ±0.02 MILES TO A POINT ±225 FEET NORTHWEST FROM LOCATION

DISTANCE & DIRECTION
FROM HWY JCT. OR TOWN: FROM THE INTERSECTION OF LAWHON RD AND GREEN POND GULLY RD, HEAD EAST

ON LAWHON RD 650 FEET, TURNING SOUTH, HEAD 350 FEET TO SURFACE LOCATION

STATE OF TEXAS
REGISTERED
JEFFREY N. LUEDERS
6512
PROFESSIONAL
LAND SURVEYOR

CERTIFICATION:

I, JEFFREY N. LUEDERS, A REGISTERED PROFESSIONAL LAND SURVEYOR, AND AN AUTHORIZED AGENT OF TOPOGRAPHIC LAND SURVEYORS, DO HEREBY CERTIFY THAT THE ABOVE DESCRIBED "PRE-CONSTRUCTION" PROPOSED WELL LOCATION WAS SURVEYED AND STAKED ON THE GROUND AS SHOWN HEREIN.

FILE NAME LO_TX245_BEAD_FARM_CO_1
DRH

DATE CERTIFIED: 05/16/2023 TEXAS REG. NO. 6512

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 05/10/2024
Tracking No.: 307853

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-

WELL INFORMATION

API 42-245-32908 **County:** JEFFERSON
Well No.: 1 **RRC District** 03
Lease BEAD FARM CO. **Field** WILDCAT
RRC Lease 28125 **Field No.:** 00006001
Location Section: 41, Block: , Survey: T&NO RR CO, Abstract: 266

Latitude 29.999222 **Longitud** -94.297363
This well is 18 **miles in a** E
direction from CLEVELAND,
which is the nearest town in the

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 12/03/2023

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	08/18/2023	891726
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 10/15/2023 **Date of first production after rig** 12/03/2023
Date plug back, deepening, drilling operation 10/15/2023 **Date plug back, deepening, recompletion, drilling operation** 12/03/2023
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 642.20 **Elevation** 23 GL
Total depth TVD 8664 **Total depth MD**
Plug back depth TVD 4087 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing Is Cementing Affidavit (Form W-15)** 94.0 Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:
Location of well, relative to nearest lease of lease on which this well is 1475.0 **Feet from the** North **Line and** 1817.0 **Feet from the** West **Line of the** BEAD FARM CO. **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1100.0	**Date**	06/19/2023
SWR 13 Exception		**Depth**	2200.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
2	Surface	13 3/8	17 1/2	2175			H	1470	3037.0	0	Circulated to Surface
3	Conductor	20	26	120			A	185	220.0	0	Circulated to Surface
4	Conventional Production	9 5/8	12 1/4	8656			H	1855	2893.0	353	Calculation

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
			/

N/A

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
		L	

N/A

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG)

Actual maximum pressure (PSIG) during hydraulic fracturing

fracturin

Has the hydraulic fracturing fluid disclosure been No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)

1	Cast Iron Bridge Plug	CAST IRON BRIDGE PLUG PLUS 3.4 CU FT CEMENT CLASS H	6290	6299
2	Cast Iron Bridge Plug	CAST IRON BRIDGE PLUG PLUS 3.4 CU FT CEMENT CLASS H	4992	5001
3	Cast Iron Bridge Plug	CAST IRON BRIDGE PLUG PLUS 3.4 CU FT CEMENT CLASS H	4087	4096

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	
CAPROCK - DISPOSAL	No			No	
SPINDLETOP SALT DOME - DISPOSAL	No			No	
FANNETT SALT DOME - DISPOSAL	No			No	
BIG HILL SALT DOME - DISPOSAL	No			No	
PLEISTOCENE-LISSIE - DISPOSAL	No			No	
MIOCENE - DISPOSAL	Yes	3522.0	3520.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6527.0	6523.0	Yes	LOGGED
MARINULINA - DISPOSAL	No			No	
HETEROSTEGINA - DISPOSAL	Yes	6274.0	6270.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS PERFORATED, TESTED, AND TEMPORARILY ABANDONED. THIS IS A TEST WELL AND HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

[RRC Staff 2024-02-23 08:49:28.617] EXPLORATORY WELL ONLY

CASING RECORD :

NONE.

TUBING RECORD:

A STRATIGRAPHIC WELL UTILIZED INJECTIVITY TEST VIA CASING.

PRODUCING/INJECTION/DISPOSAL INTERVAL :

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

PERFORATED BETWEEN X AND X - ALL ISOLATED WITH PLUGS AND CEMENT.

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION			
Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	04/22/2024

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Form W-15
Rev. 08/2014

CEMENTING REPORT

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name:	Operator P-5 No.:
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson
Well No.: 1	API No.: 42 - 245 - 32908 Drilling Permit No.: 891726
Lease Name: Bead Farm Company	Lease No.:
Field Name: Wildcat	Field No.:

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☒ Production

Drilled hole size (in.): 12-1/4"	Depth of drilled hole (ft.): 8,671 MD	Est. % wash-out or hole enlargement: 3%
Size of casing in O.D. (in.): 9-5/8"	Casing weight (lbs/ft) and grade: 53.5 L-80	No. of centralizers used: 52
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☑ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 8,658 ft	Top of liner (ft.):
		Setting depth liner (ft.):
Hrs. waiting on cement before drill-out: N/A	Calculated top of cement (ft.): 305	Cementing date: 11/8/2023

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	1855	H	45 SCR100	2893	8366
2					
3					
Total	1855			2893	8,366

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date	11/24/2023	11/27/2023	11/30/2023				
Size of hole or pipe (in.)	9.625"	9.625"	9.625"				
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)	n/a	n/a	n/a				
CIBP setting depth (ft.)	6299	5001	4096				
Amount of cement on top of CIBP (ft.)	8.25	8.25	8.25				
Sacks of cement used							
Slurry volume pumped (cu. ft.)	3.4	3.4	3.4				
Calculated top of plug (ft.)	6290.75	4992.75	4087.75				
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)	17	17	17				
Class/type of cement	H	H	H				
Perforate and squeeze (YES/NO)	No	No	No				

REMARKS

Patrick Hart

EXXON, BEAD FARM CO, #1, PRODUCTION

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

JEROD HACK, SERVICE SUPERVISOR	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	11/08/2023
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

Timothy L Greene	Well Operations Supv.	
Typed or printed name of operator's representative	Title	Signature

4763 Oak Knoll Ln.	Montgomery	TX 77316	281-732-1469	11/03/23
Address	City, State, Zip Code	Tel: Area Code	Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing and Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. Slurry data: If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

CEMENTING REPORT

OPERATOR INFORMATION

Operator Name: XOM Low Carbon Solutions	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson		
Well No.: 1	API No.: 42-245-32908	Drilling Permit No.: 891726	
Lease Name: Bend Farm Company	Lease No.:		
Field Name: Wildcat	Field No.:		

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☒ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 17-1/2"	Depth of drilled hole (ft.): 2,185	Est. % wash-out or hole enlargement: 27%	
Size of casing in O.D. (in.): 13-3/8"	Casing weight (lbs/ft) and grade: 54.5	No. of centralizers used: 18	
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 2,175	Top of liner (ft.):	
		Setting depth liner (ft.):	
Hrs. waiting on cement before drill-out: 34	Calculated top of cement (ft.): 0	Cementing date: 10/18/2023	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	1015	A	SEE REMARKS	2395	1359
2	455	H	SEE REMARKS	642	816
3					
Total	1470			3037	2175

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS
SLURRY 1-ECONOCEM (TM) SLURRY 2-EXTENDACEM (TM)

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

ZACHARY HOWARD-SERVICE SUPERVISOR	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	10/18/2023
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James A. Reavis	Drilling Eng.	
Typed or printed name of operator's representative	Title	Signature

22777 Springwood Village Pkwy	TX 77389	701-978-8939	4/3/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Wellness 3 Room 3A.591

Instructions for Form W-15, Cementing Report

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To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing and Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967
CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name:	~~Byrd Oilfield Services~~ XOM Low Carb Solutions	Operator P-5 No.:	101256
Cementer Name:	Cudd Pumping Services	Cementer P-5 No.:	191917

WELL INFORMATION

District No.:	3	County:	Jefferson
Well No.:	1	API No.:	42-245-32708 Drilling Permit No.: 791726
Lease Name:	Bead Farm Company	Lease No.:	
Field Name:	Wildcat	Field No.:	

I CASING CEMENTING DATA

Type of casing: [X] Conductor [ ] Surface [ ] Intermediate [ ] Liner [ ] Production

Drilled hole size (in.): 26	Depth of drilled hole (ft.): 120	Est. % wash-out or hole enlargement:	
Size of casing in O.D. (in.): 20	Casing weight (lbs/ft) and grade: 78.6 ppf X-52	No. of centralizers used:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [X] Yes [ ] No If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 120	Top of liner (ft.):	
		Setting depth liner (ft.):	
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date: 9/11/2023	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu.ft.)	Height (ft.)
1	185	A	1% SA001	220.0	145
2					
3					
Total	185			220.0	145

II CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement shoe [ ] Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] Yes [ ] No		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu.ft.)	Height (ft.)
1					
2					
3					
Total					

III CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement/DV tool [ ] Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] Yes [ ] No		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu.ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

Artemio Rivera Service Supervisor	Cudd Pumping Services	
Name and title of cementer's representative	Cementing Company	Signature

1434 CR 422	Pleasanton	TX	78064	1830-254-4200	September 11, 2023
Address	City,	State,	Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data

James Harvey	Operations Supt.	
Type or printed name of operator's representative	Title	Signature

				512 749 8222	9/11/23
Address	City,	State,	Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.
The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

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To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing and Multi-stage cement shoe. The operator must report the multi-stage cement tool in II. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division
Tracking No.: 307853

ELECTRIC LOG STATUS REPORT

This facsimile L-1 was generated electronically from data submitted to the RRC.

FORM L-1

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 12/03/2023
Field Name WILDCAT	Drilling Permit No. 891726	
Lease Name BEAD FARM CO.	Lease/ID No. 28125	Well No. 1
County JEFFERSON	API No. 42- 245-32908	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

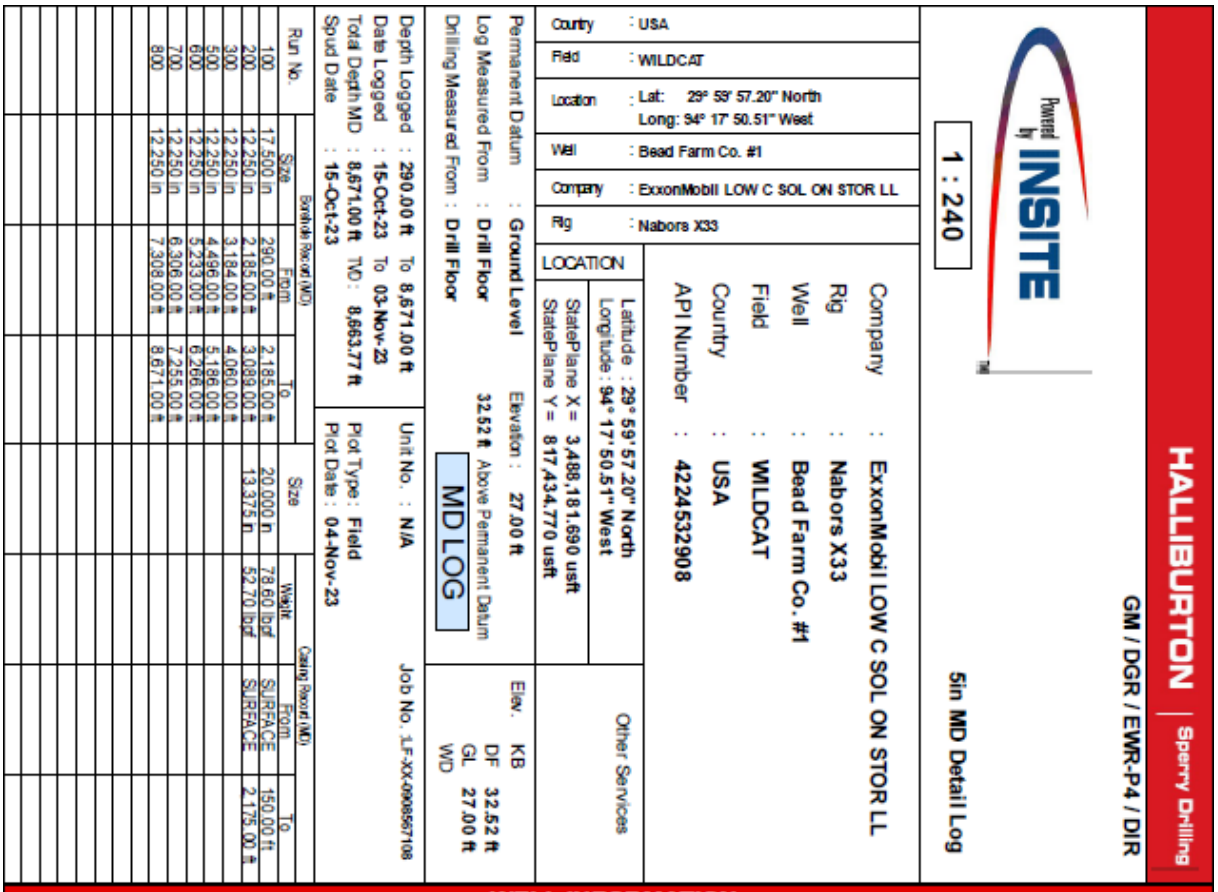
Lease or ID No(s). _____

Well No(s). _____

Josh Calkin Signature	Title
EXXONMOBIL LOW C SOL ON STOR LLC Name (print)	(281) 702-5537 Phone 02/08/2024 Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION



WELL INFORMATION

MWD Run Number	100	200	300	400	500
Date run completed	16-Oct-23	20-Oct-23	23-Oct-23	25-Oct-23	27-Oct-23
Rig Bit Number	100	200	300	400	500
Bit Size (in)	17.500	12.250	12.250	12.250	12.250
Tool Nominal OD (in)	8.000	8.000	8.000	8.000	8.000
Log Start Depth (MD, ft)	152.00	2,185.00	3,200.00	4,122.00	4,496.00
Log End Depth (MD, ft)	2,185.00	3,089.00	4,060.00	4,460.00	5,186.00
Drill or Wipe	Drill	Drill	Drill	Drill	Drill
Drill/Wipe Start Date and Time	15-Oct-23 09:45	20-Oct-23 06:40	23-Oct-23 02:15	24-Oct-23 22:21	26-Oct-23 16:09
Drill/Wipe End Date and Time	16-Oct-23 03:55	20-Oct-23 15:15	23-Oct-23 12:24	25-Oct-23 02:14	27-Oct-23 05:09
Min Inc (deg) @ Depth (MD, ft)	0.19 @385.00	2.41 @2,263.00	2.29 @3,868.00	1.37 @4,344.00	1.66 @4,527.00
Max Inc (deg) @ Depth (MD, ft)	2.24 @2,113.00	3.81 @3,015.00	4.09 @3,112.00	2.65 @4,056.00	2.54 @5,110.00
Bit TFA(in2) / Bit Type	0.91 / PDC	0.91 / PDC	0.91 / PDC	0.91 / PDC	0.91 / PDC
Flow Rate (gpm)	700.00	600.00	605.00	605.00	600.00
Max AV (fpm) / CV (fpm) @ MWD	80.0 / 85.6	175.0 / 172.0	175.0 / 180.0	195.3 / 0.0	171.3 / 180.0
Fluid Type	Native/Spud Mud	Mineral Oil Bas	Mineral Oil Bas	Mineral Oil Bas	Mineral Oil Bas
Density (ppg) / Viscosity (spqt)	9.00 / 33.00	9.10 / 48.00	10.00 / 72.00	10.50 / 67.00	10.50 / 59.00
Filtrate CL (ppm)	1,100.00	32,500.00	75,000.00	74,000.00	69,000.00
pH / API Filtrate (mptm)	8.00 / 14	N/A / 0	N/A / 0	N/A / 0	N/A / 0
PV (cP) / YP (lhf2)	10 / 5.00	9 / 7.00	23 / 17.00	23 / 18.00	21 / 24.00
% Solids / % Sand	4.9 / .01	7.2 / 0	9.3 / 0	10.5 / 0	11.8 / 0
% Oil / Oil:Water Ratio	0 / 0:100	74.73 / 75:25	53 / 60:40	52 / 60:40	54 / 64:36
Rm @ Measured Temp (degF)	0.100 @70.00	N/A@N/A	N/A@N/A	N/A@N/A	N/A@N/A
Rmf @ Measured Temp (degF)	0.10 @70.00	N/A@N/A	N/A@N/A	N/A@N/A	N/A@N/A
Rmc @ Measured Temp (degF)	0.100 @70.00	N/A@N/A	N/A@N/A	N/A@N/A	N/A@N/A
Max Tool Temp (degF) / Source	102.20 / TM	130.82 / HDM	137.88 / HDM	141.41 / HDM	152.00 / HDM
Rm @ Max Tool Temp (degF)	0.0705 @ 102.20	N/A @ 130.82	N/A @ 137.88	N/A @ 141.41	N/A @ 152.00
Lead MWD Engineer	Alex Killgore	Alex Killgore	Alex Killgore	Alex Killgore	Jason Anderson
Customer Representative	N/A	N/A	N/A	N/A	N/A

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON
4607 HWY 90 EAST • BROUSSARD, LA 70518
PHONE 337 837 3061 • FAX 337 837 4400

November 9, 2023

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
BEAD FARM CO. 1
Permit No. 891726
Jefferson County, TX
API # 42-245-32908

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Coy Lorraine, M/LWD Service Quality
Drainhole Number	-	Original
Surveyed Depths	-	210' – 8598' MWD Surveys performed by Sperry Drilling
Dates Performed	-	October 15, 2023 to November 3, 2023
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,

Kristen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 908567108

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx
Rose Prospect CCS
Bead Farm Co. #1

001 ST00BP00

Design: 001 ST00BP00

Sperry Drilling Services

Geodetic Report

15 November, 2023

Well Coordinates: 817,434.77 N, 3,488,181.69 E (29° 59' 57.20" N, 094° 17' 50.51" W)
Ground Level: 27.00 usft

Local Coordinate Origin:	Centered on Well Bead Farm Co. #1
Viewing Datum:	(32.52') Nabors X-33 @ 59.52usft (Rig on Loc)
TVDs to System:	N
North Reference:	Grid
Unit System:	API US Survey Feet

Version: 5000.17 Build: 02

HALLIBURTON

Design Report for Bead Farm Co. #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	29° 59' 57.199 N	94° 17' 50.509 W	817,434.77	3,488,181.69
210.00	0.37	164.70	210.00	-0.65	0.18	29° 59' 57.193 N	94° 17' 50.508 W	817,434.12	3,488,181.87
303.00	0.22	187.45	303.00	-1.12	0.24	29° 59' 57.188 N	94° 17' 50.507 W	817,433.65	3,488,181.92
385.00	0.19	234.94	385.00	-1.35	0.10	29° 59' 57.186 N	94° 17' 50.509 W	817,433.42	3,488,181.79
576.00	0.29	216.67	576.00	-1.92	-0.44	29° 59' 57.180 N	94° 17' 50.515 W	817,432.85	3,488,181.24
757.00	0.56	181.75	756.99	-3.18	-0.75	29° 59' 57.168 N	94° 17' 50.519 W	817,431.59	3,488,180.94
854.00	0.34	176.13	853.99	-3.94	-0.74	29° 59' 57.161 N	94° 17' 50.520 W	817,430.83	3,488,180.95
945.00	0.82	187.51	944.98	-4.85	-0.81	29° 59' 57.152 N	94° 17' 50.521 W	817,429.92	3,488,180.88
1,133.00	0.74	222.83	1,132.97	-7.08	-1.81	29° 59' 57.130 N	94° 17' 50.533 W	817,427.69	3,488,179.88
1,326.00	0.83	215.12	1,325.95	-9.13	-3.46	29° 59' 57.110 N	94° 17' 50.553 W	817,425.64	3,488,178.23
1,512.00	0.59	246.91	1,511.93	-10.61	-5.12	29° 59' 57.096 N	94° 17' 50.572 W	817,424.16	3,488,176.57
1,705.00	0.67	215.11	1,704.92	-11.92	-6.68	29° 59' 57.084 N	94° 17' 50.591 W	817,422.85	3,488,175.01
1,888.00	1.47	212.95	1,887.89	-14.77	-8.57	29° 59' 57.057 N	94° 17' 50.613 W	817,420.00	3,488,173.12
2,083.00	1.95	211.16	2,082.80	-19.71	-11.65	29° 59' 57.009 N	94° 17' 50.651 W	817,415.06	3,488,170.04
2,113.00	2.24	206.92	2,112.78	-20.67	-12.18	29° 59' 57.000 N	94° 17' 50.657 W	817,414.10	3,488,169.51
2,263.00	2.41	205.91	2,262.66	-26.12	-14.88	29° 59' 56.947 N	94° 17' 50.690 W	817,408.65	3,488,166.81
2,360.00	2.56	206.53	2,359.57	-29.89	-16.74	29° 59' 56.910 N	94° 17' 50.713 W	817,404.88	3,488,164.95
2,457.00	2.68	206.96	2,456.47	-33.85	-18.74	29° 59' 56.872 N	94° 17' 50.738 W	817,400.92	3,488,162.95
2,553.00	2.83	208.18	2,552.36	-37.94	-20.87	29° 59' 56.832 N	94° 17' 50.764 W	817,396.83	3,488,160.81
2,649.00	3.06	209.03	2,648.23	-42.27	-23.24	29° 59' 56.790 N	94° 17' 50.793 W	817,392.50	3,488,158.45
2,828.00	3.68	211.90	2,826.92	-51.32	-28.59	29° 59' 56.703 N	94° 17' 50.858 W	817,383.45	3,488,153.10
2,922.00	3.78	213.09	2,920.72	-56.48	-31.88	29° 59' 56.653 N	94° 17' 50.897 W	817,378.29	3,488,149.81
3,015.00	3.81	212.63	3,013.51	-61.65	-35.22	29° 59' 56.603 N	94° 17' 50.938 W	817,373.12	3,488,146.47
3,112.00	4.09	213.44	3,110.28	-67.25	-38.86	29° 59' 56.549 N	94° 17' 50.982 W	817,367.52	3,488,142.83
3,206.00	3.90	216.01	3,204.06	-72.63	-42.59	29° 59' 56.498 N	94° 17' 51.026 W	817,362.14	3,488,139.10
3,302.00	3.43	220.91	3,299.86	-77.44	-46.39	29° 59' 56.452 N	94° 17' 51.072 W	817,357.33	3,488,135.30
3,396.00	3.08	227.55	3,393.71	-81.27	-50.09	29° 59' 56.415 N	94° 17' 51.116 W	817,353.50	3,488,131.60
3,493.00	2.63	238.21	3,490.59	-84.21	-53.91	29° 59' 56.388 N	94° 17' 51.160 W	817,350.56	3,488,127.78
3,681.00	3.03	236.09	3,678.36	-89.25	-61.70	29° 59' 56.341 N	94° 17' 51.251 W	817,345.52	3,488,119.99
3,773.00	3.07	236.39	3,770.23	-91.97	-65.77	29° 59' 56.316 N	94° 17' 51.299 W	817,342.80	3,488,115.92
3,868.00	2.29	245.55	3,865.12	-94.16	-69.61	29° 59' 56.295 N	94° 17' 51.343 W	817,340.61	3,488,112.08
3,961.00	2.48	247.19	3,958.04	-95.71	-73.16	29° 59' 56.282 N	94° 17' 51.384 W	817,339.06	3,488,108.53
3,987.00	2.58	248.05	3,984.02	-96.15	-74.22	29° 59' 56.278 N	94° 17' 51.397 W	817,338.62	3,488,107.47
4,056.00	2.65	247.41	4,052.95	-97.34	-77.13	29° 59' 56.267 N	94° 17' 51.430 W	817,337.43	3,488,104.56
4,152.00	2.07	251.51	4,148.86	-98.75	-80.83	29° 59' 56.255 N	94° 17' 51.473 W	817,336.02	3,488,100.86
4,246.00	1.39	261.83	4,242.82	-99.45	-83.56	29° 59' 56.249 N	94° 17' 51.504 W	817,335.32	3,488,098.12
4,344.00	1.37	260.60	4,340.79	-99.81	-85.90	29° 59' 56.246 N	94° 17' 51.531 W	817,334.96	3,488,095.79
4,386.00	1.49	262.00	4,382.78	-99.96	-86.93	29° 59' 56.245 N	94° 17' 51.543 W	817,334.81	3,488,094.76
4,434.00	1.58	261.67	4,430.76	-100.15	-88.21	29° 59' 56.244 N	94° 17' 51.557 W	817,334.62	3,488,093.48
4,527.00	1.66	264.88	4,523.73	-100.45	-90.82	29° 59' 56.242 N	94° 17' 51.587 W	817,334.32	3,488,090.87
4,624.00	1.76	264.59	4,620.68	-100.72	-93.70	29° 59' 56.240 N	94° 17' 51.620 W	817,334.05	3,488,087.99
4,718.00	1.77	268.05	4,714.64	-100.90	-96.59	29° 59' 56.240 N	94° 17' 51.653 W	817,333.87	3,488,085.10

Design Report for Bead Farm Co. #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
4,813.00	1.97	270.81	4,809.59	-100.93	-99.69	29° 59' 56.240 N	94° 17' 51.688 W	817,333.84	3,488,082.00
4,908.00	2.18	273.99	4,904.52	-100.78	-103.12	29° 59' 56.243 N	94° 17' 51.727 W	817,333.99	3,488,078.57
5,001.00	2.30	275.15	4,997.45	-100.49	-106.74	29° 59' 56.248 N	94° 17' 51.768 W	817,334.28	3,488,074.94
5,097.00	2.45	274.72	5,093.37	-100.15	-110.71	29° 59' 56.253 N	94° 17' 51.813 W	817,334.62	3,488,070.98
5,110.00	2.54	275.19	5,106.36	-100.10	-111.27	29° 59' 56.253 N	94° 17' 51.820 W	817,334.67	3,488,070.42
5,283.00	2.66	275.59	5,279.18	-99.36	-119.08	29° 59' 56.264 N	94° 17' 51.908 W	817,335.41	3,488,062.60
5,378.00	2.82	274.34	5,374.07	-98.97	-123.61	29° 59' 56.269 N	94° 17' 51.959 W	817,335.80	3,488,058.08
5,472.00	1.88	278.50	5,467.99	-98.57	-127.44	29° 59' 56.275 N	94° 17' 52.003 W	817,336.20	3,488,054.25
5,569.00	1.35	294.54	5,564.95	-97.86	-130.05	29° 59' 56.283 N	94° 17' 52.032 W	817,336.91	3,488,051.64
5,661.00	1.18	310.30	5,656.93	-96.80	-131.76	29° 59' 56.294 N	94° 17' 52.051 W	817,337.97	3,488,049.93
5,755.00	1.30	312.59	5,750.91	-95.45	-133.28	29° 59' 56.308 N	94° 17' 52.068 W	817,339.32	3,488,048.40
5,948.00	1.22	7.87	5,943.87	-91.93	-134.61	29° 59' 56.343 N	94° 17' 52.081 W	817,342.84	3,488,047.07
6,040.00	1.46	19.21	6,035.84	-89.85	-134.09	29° 59' 56.364 N	94° 17' 52.074 W	817,344.92	3,488,047.59
6,135.00	1.92	28.48	6,130.80	-87.31	-132.94	29° 59' 56.388 N	94° 17' 52.060 W	817,347.46	3,488,048.75
6,150.66	1.94	29.14	6,146.45	-86.85	-132.68	29° 59' 56.393 N	94° 17' 52.057 W	817,347.92	3,488,049.01
6,228.00	2.06	32.16	6,223.75	-84.53	-131.30	29° 59' 56.415 N	94° 17' 52.040 W	817,350.24	3,488,050.38
6,325.00	2.10	31.84	6,320.68	-81.54	-129.44	29° 59' 56.444 N	94° 17' 52.017 W	817,353.23	3,488,052.25
6,422.00	2.19	29.54	6,417.62	-78.42	-127.59	29° 59' 56.474 N	94° 17' 51.995 W	817,356.35	3,488,054.10
6,513.00	2.21	30.12	6,508.55	-75.39	-125.85	29° 59' 56.504 N	94° 17' 51.974 W	817,359.38	3,488,055.84
6,515.93	2.21	30.12	6,511.48	-75.29	-125.79	29° 59' 56.504 N	94° 17' 51.973 W	817,359.48	3,488,055.89
6,607.00	2.23	29.44	6,602.48	-72.23	-124.04	29° 59' 56.534 N	94° 17' 51.952 W	817,362.54	3,488,057.65
6,701.00	2.29	28.78	6,696.40	-68.99	-122.24	29° 59' 56.565 N	94° 17' 51.930 W	817,365.78	3,488,059.45
6,796.00	2.36	28.05	6,791.33	-65.60	-120.41	29° 59' 56.598 N	94° 17' 51.908 W	817,369.17	3,488,061.28
6,892.00	2.46	31.47	6,887.24	-62.10	-118.40	29° 59' 56.632 N	94° 17' 51.883 W	817,372.67	3,488,063.29
6,985.00	2.60	29.02	6,980.15	-58.55	-116.33	29° 59' 56.666 N	94° 17' 51.858 W	817,376.22	3,488,065.35
7,079.00	2.71	27.06	7,074.05	-54.71	-114.29	29° 59' 56.704 N	94° 17' 51.833 W	817,380.06	3,488,067.40
7,141.00	2.79	26.24	7,135.98	-52.05	-112.96	29° 59' 56.729 N	94° 17' 51.817 W	817,382.72	3,488,068.73
7,266.00	2.85	26.77	7,260.83	-46.55	-110.21	29° 59' 56.783 N	94° 17' 51.783 W	817,388.22	3,488,071.48
7,363.00	2.99	25.96	7,357.70	-42.12	-108.02	29° 59' 56.826 N	94° 17' 51.756 W	817,392.65	3,488,073.67
7,459.00	3.01	26.60	7,453.57	-37.61	-105.79	29° 59' 56.869 N	94° 17' 51.729 W	817,397.16	3,488,075.90
7,555.00	2.97	25.12	7,549.44	-33.11	-103.61	29° 59' 56.913 N	94° 17' 51.702 W	817,401.66	3,488,078.08
7,651.00	3.04	23.94	7,645.31	-28.53	-101.52	29° 59' 56.957 N	94° 17' 51.676 W	817,406.24	3,488,080.17
7,748.00	3.11	23.38	7,742.17	-23.76	-99.43	29° 59' 57.004 N	94° 17' 51.650 W	817,411.01	3,488,082.26
7,837.00	3.11	21.92	7,831.04	-19.31	-97.57	29° 59' 57.047 N	94° 17' 51.627 W	817,415.46	3,488,084.12
7,931.00	3.13	22.72	7,924.90	-14.58	-95.63	29° 59' 57.093 N	94° 17' 51.603 W	817,420.19	3,488,086.06
8,026.00	3.28	22.62	8,019.75	-9.68	-93.58	29° 59' 57.141 N	94° 17' 51.577 W	817,425.09	3,488,088.11
8,123.00	3.29	23.34	8,116.59	-4.56	-91.41	29° 59' 57.190 N	94° 17' 51.550 W	817,430.21	3,488,090.28
8,215.00	3.21	22.93	8,208.44	0.24	-89.36	29° 59' 57.237 N	94° 17' 51.525 W	817,435.01	3,488,092.33
8,309.00	3.25	23.97	8,302.29	5.10	-87.26	29° 59' 57.284 N	94° 17' 51.499 W	817,439.87	3,488,094.43
8,404.00	3.23	26.22	8,397.14	9.96	-84.98	29° 59' 57.332 N	94° 17' 51.470 W	817,444.73	3,488,096.71
8,498.00	3.05	26.32	8,491.00	14.58	-82.70	29° 59' 57.376 N	94° 17' 51.442 W	817,449.35	3,488,098.99
8,528.63	3.02	25.60	8,521.59	16.03	-81.99	29° 59' 57.390 N	94° 17' 51.434 W	817,450.80	3,488,099.70

Design Report for Bead Farm Co. #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
8,598.00	2.96	23.92	8,590.86	19.32	-80.47	29° 59' 57.422 N	94° 17' 51.415 W	817,454.09	3,488,101.22
8,671.00	2.96	23.92	8,663.76	22.77	-78.94	29° 59' 57.456 N	94° 17' 51.396 W	817,457.54	3,488,102.74

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
210.00	2,113.00	01 HAL MWD (MagVarMS) 17 1/2" Hole 210' - 2113'	3_MWD+HRGM+MS
2,263.00	8,598.00	02 HAL MWD (MagVarMS) 12 1/4" Hole 2263' - 8598'	3_MWD+HRGM+MS

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
100.00	100.00	20" Conductor Casing	20	20

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated

Design Report for Bead Farm Co. #1 - 001 ST00BP00

Directional Difficulty Index

Average Dogleg over Survey:	0.24 °/100usft	Maximum Dogleg over Survey:	1.10 °/100usft at 2,113.00 usft
Net Tortousity applicable to Plans:	0.24 °/100usft	Directional Difficulty Index:	3.816

Audit Info

HALLIBURTON

ExxonMobil

Jefferson County, Tx

North Reference Sheet for Rose Prospect CCS - Bead Farm Co. #1 - 001 ST00BP00

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 59.52usft (Rig on Loc). Northing and Easting are relative to Bead Farm Co. #1

Coordinate System is US State Plane 1927 (Exact solution), Texas South Central 4204 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 2,000,000.00usft, False Northing: 0.00usft, Scale Reduction: 0.99993028

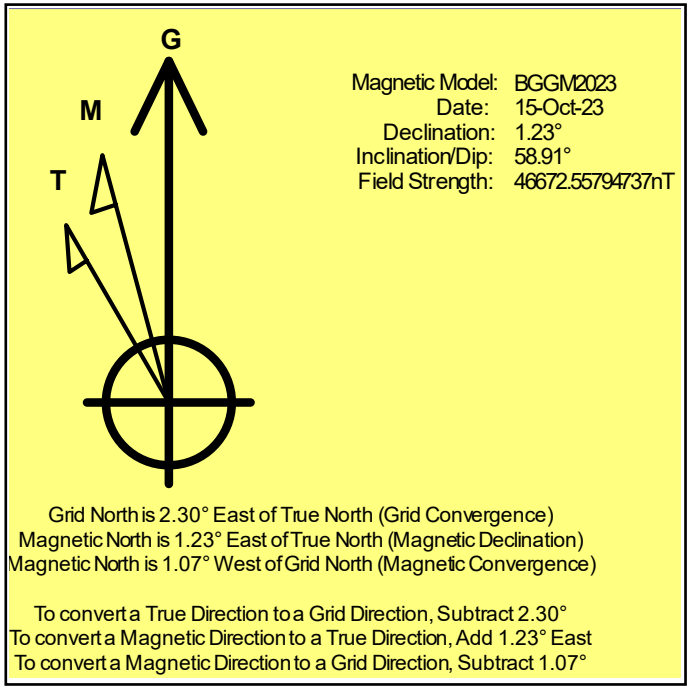
Grid Coordinates of Well: 817,434.77 usft N, 3,488,181.69 usft E

Geographical Coordinates of Well: 29° 59' 57.20" N, 094° 17' 50.51" W

Grid Convergence at Surface is: 2.30°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,671.00usft

the Bottom Hole Displacement is 82.16usft in the Direction of 286.09° (Grid).
Magnetic Convergence at surface is: 1.07° (15 October 2023, , BGGM2023)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

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*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

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Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
891726	Aug 18, 2023	* 03
API NUMBER	FORM W-1 RECEIVED	COUNTY
42-245-32908	Jun 28, 2023	JEFFERSON
TYPE OF OPERATION	WELLBORE PROFILE(S)	ACRES
NEW DRILL	Vertical	642.2

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM W1.2B.02
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE
This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.
District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM CO.	1
LOCATION	TOTAL DEPTH
18 miles E direction from CLEVELAND	8700

Section, Block and/or Survey

SECTION 41 BLOCK ABSTRACT 266

SURVEY T&NO RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1475 ft. N 1817 ft. W	ft.
DISTANCE TO LEASE LINES	DISTANCE TO NEAREST WELL ON LEASE
1475 ft. N 1817 ft. W	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES	DEPTH	WELL #	DIST
	NEAREST LEASE		NEAREST WE	
WILDCAT	642.20	8,495	1	03
BEAD FARM CO.			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
481 WINSCOTT ROAD, Ste. 200 • BENBROOK, TEXAS 76126
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
TEXAS FIRM REGISTRATION NO. 10042504
WWW.TOPOGRAPHIC.COM

JEFFERSON COUNTY, TEXAS

SECTION 41, T. & N.O.R.R. CO. SURVEY, A-266

LEGEND

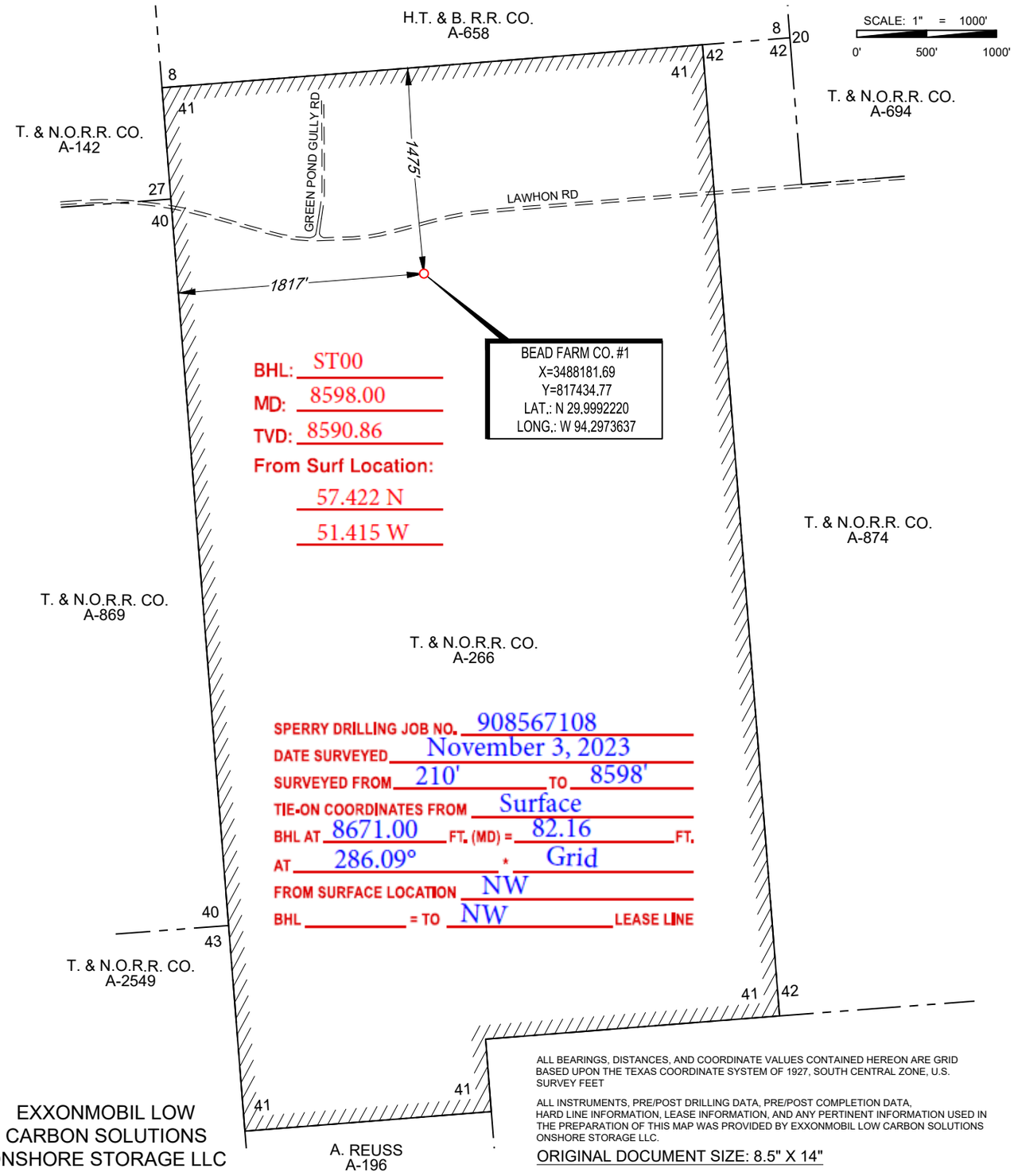
- UNIT/LEASE BOUNDARY
- SECTION LINE
- ROAD
- PROPOSED WELL

UNIT/LEASE SURVEY

S.H.L.	1817' FWL 1475' FNL	T. & N.O.R.R. CO., A-266 1817' FWL & 1475' FNL

N

SCALE: 1" = 1000'
0' 500' 1000'



BEAD FARM CO. #1
X=3488181.69
Y=817434.77
LAT.: N 29.9992220
LONG.: W 94.2973637

BHL: ST00
MD: 8598.00
TVD: 8590.86
From Surf Location:
57.422 N
51.415 W

SPERRY DRILLING JOB NO. 908567108
DATE SURVEYED November 3, 2023
SURVEYED FROM 210' TO 8598'
TIE-ON COORDINATES FROM Surface
BHL AT 8671.00 FT. (MD) = 82.16 FT.
AT 286.09° * Grid
FROM SURFACE LOCATION NW
BHL _____ = TO NW LEASE LINE

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE TEXAS COORDINATE SYSTEM OF 1927, SOUTH CENTRAL ZONE, U.S. SURVEY FEET

ALL INSTRUMENTS, PRE/POST DRILLING DATA, PRE/POST COMPLETION DATA, HARD LINE INFORMATION, LEASE INFORMATION, AND ANY PERTINENT INFORMATION USED IN THE PREPARATION OF THIS MAP WAS PROVIDED BY EXXONMOBIL LOW CARBON SOLUTIONS ONSHORE STORAGE LLC.

ORIGINAL DOCUMENT SIZE: 8.5" X 14"

EXXONMOBIL LOW CARBON SOLUTIONS ONSHORE STORAGE LLC

LEASE NAME & WELL NO.: BEAD FARM CO. #1 LEASE ACREAGE: CALLED 642.2 DATE OF SURVEY: APRIL 21, 2023

LOCATED: ±12 MILES SOUTHWEST OF BEAUMONT, TX GROUND ELEVATION: 23'

BEST ACCESSIBILITY TO LOCATION: ±0.02 MILES TO A POINT ±225 FEET NORTHWEST FROM LOCATION

DISTANCE & DIRECTION
FROM HWY JCT. OR TOWN: FROM THE INTERSECTION OF LAWHON RD AND GREEN POND GULLY RD, HEAD EAST

ON LAWHON RD 650 FEET, TURNING SOUTH, HEAD 350 FEET TO SURFACE LOCATION

STATE OF TEXAS
REGISTERED
JEFFREY N. LUEDERS
6512
PROFESSIONAL
LAND SURVEYOR

CERTIFICATION:

I, JEFFREY N. LUEDERS, A REGISTERED PROFESSIONAL LAND SURVEYOR, AND AN AUTHORIZED AGENT OF TOPOGRAPHIC LAND SURVEYORS, DO HEREBY CERTIFY THAT THE ABOVE DESCRIBED "PRE-CONSTRUCTION" PROPOSED WELL LOCATION WAS SURVEYED AND STAKED ON THE GROUND AS SHOWN HEREIN.

FILE NAME LO_TX245_BEAD_FARM_CO_1
DRH

DATE CERTIFIED: 05/16/2023 TEXAS REG. NO. 6512

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Coy Lorraine,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **October 15, 2023 to November 3, 2023** conduct or supervise the taking of Directional Surveys as follow:

- **210' to a depth of 8598' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8671'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **BEAD FARM CO. 1** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Coy Lorraine

Coy Lorraine, M/LWD Service Quality

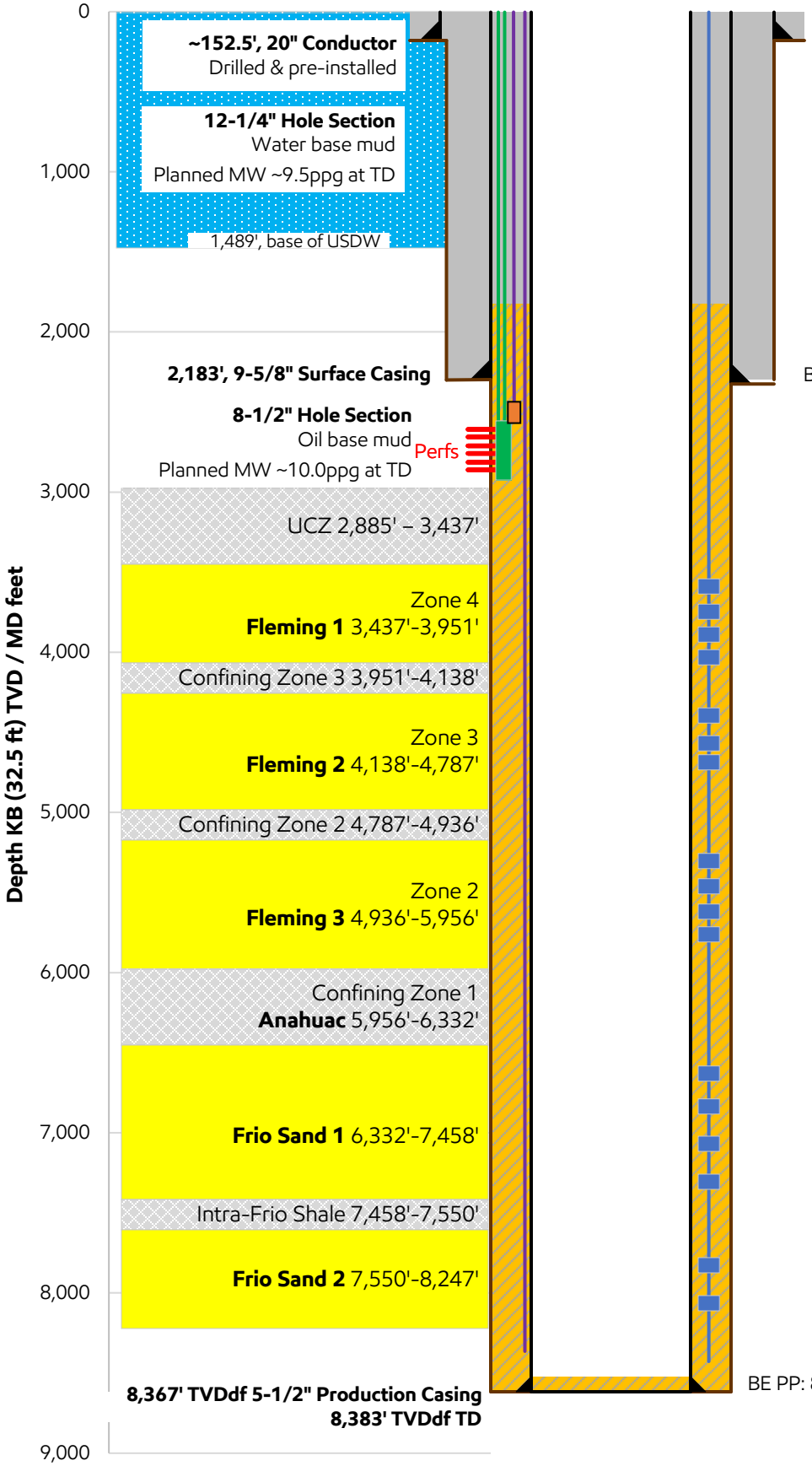
CONFIDENTIAL BUSINESS INFORMATION

4224532914 Bead Farm Co. #4 (In-Zone Monitoring Well No. 01)

CONFIDENTIAL BUSINESS INFORMATION

Rose CCS Project Bead Farm Company #4

Wellbore Schematic



20" Conductor
78.6 ppf, X-52, Welded
0.375" WT, 19.25" ID
Burst: 1,950, Collapse: 320 psi, Tensile: 1,202 kips

9-5/8" Surface casing, 40 ppf, J-55, BTC, from surface to 2,183'
0.395" WT, 8.835" ID, 8.679" Drift
Burst: 3,950 psi, Collapse: 2,570 psi, Tensile: 630 kips

Cement:
Lead Cmt – 12.0 ppg, Surface—1,780'
Tail Cmt – 15.0 ppg, 1,700'—2,183'

BE PP: 8.52ppg, BE FG: 12.85ppg BHST: 104°F

U-tube (2,466') + Perfs gun: Fluid sampling in permeable formation above UCZ – from 2491' to 2501'
Complete with Weatherford fiber optic P/T gauge

5-1/2", 20 ppf, L80, BTC from surface to 2,873'
0.361" WT, 4.778" ID, 4.653" Drift
Burst: 9,190 psi, Collapse: 8,830 psi, 466 kips
5-1/2", 23ppf, 22Cr125, VAM TOP from 2,873' to 3,472'
0.415" WT, 4.670" ID, 4.545" Drift
Burst: 16,980 psi, Collapse: 16,070 psi, 829 kips
5-1/2", 20 ppf, 13Cr-80, VAM21 from 3,472' to 8,234"
0.361" WT, 4.778" ID, 4.653" Drift
Burst: 9,190 psi, Collapse: 8,830 psi, 466 kips
5-1/2", 20 ppf, L80, BTC from 8,234' to 8,367'
0.361" WT, 4.778" ID, 4.653" Drift
Burst: 9,190 psi, Collapse: 8,830 psi, 466 kips

Cement:
Lead 12.5 ppg, from surface to 1,893'
Tail 13.5 ppg CO2 compatible cement, from 1,893' to 8,383'

Fiber Optic to 8,234'

TEC: P/T 17 sensors spread across 4 injection zones and permeable formation below UCZ:

Top: 3,427' 3,530' 3,692' 3,829' 4,145' 4,186' 4,696' 5,002' 5,309' 5,501' 5,795' 6,660' 6,857' 7,047' 7,267' 7,657' 7,787' MD (0.6' thickness)

BE PP: 8.62ppg, BE FG: 14.16ppg BHST: 194°F

CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32914

Drilling Permit # 901180

SWR Exception

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256

2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC

3. Operator Address (include street, city, state, zip): ATTN EDWARD E GRAHAM, 22777 SPRINGWOODS VILLAGE PKWY, SPRING, TX 77389-0000

4. Lease Name: BEAD FARM COMPANY

5. Well No.: 4

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 10000

9. Do you have the right to develop the minerals under any right-of-way ? [ ] Yes [X] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03

12. County: JEFFERSON

13. Surface Location [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 3 miles in a SE direction from China, TX which is the nearest town in the county of the well site.

15. Section: 7

16. Block:

17. Survey: HT&B RR CO

18. Abstract No.: A-150

19. Distance to nearest lease line: ft.

20. Number of contiguous acres in lease, pooled unit, or unitized tract: 454

21. Lease Perpendiculars: 522 ft from the SOUTH line and 1434 ft from the EAST line.

22. Survey Perpendiculars: 522 ft from the SOUTH line and 1434 ft from the EAST line.

23. Is this a pooled unit? [ ] Yes [X] No

24. Unitization Docket No:

25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION — List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	10000	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks

Certificate:

I certify that information stated in this application is true and complete, to the best of my knowledge.

Josh Calkin — Name of filer

Jul 10, 2024 — Date submitted

(281)702-5537 — Phone

Josh.Calkin@erm.com — E-mail Address (OPTIONAL)

RRC Use Only Data Validation Time Stamp: Mar 27, 2025 2:00 PM(Current Version)

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

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***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
901180	Jul 11, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32914	Jul 10, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	454

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM COMPANY	4
LOCATION	**TOTAL DEPTH**
3 miles SE direction from CHINA, TX	10000

Section, Block and/or Survey

SECTION 7 BLOCK ABSTRACT 150

SURVEY HT&B RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
522 ft. SOUTH 1434 ft. EAST	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
522 ft. SOUTH 1434 ft. EAST	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	454.00	10,000	4	03
BEAD FARM COMPANY			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

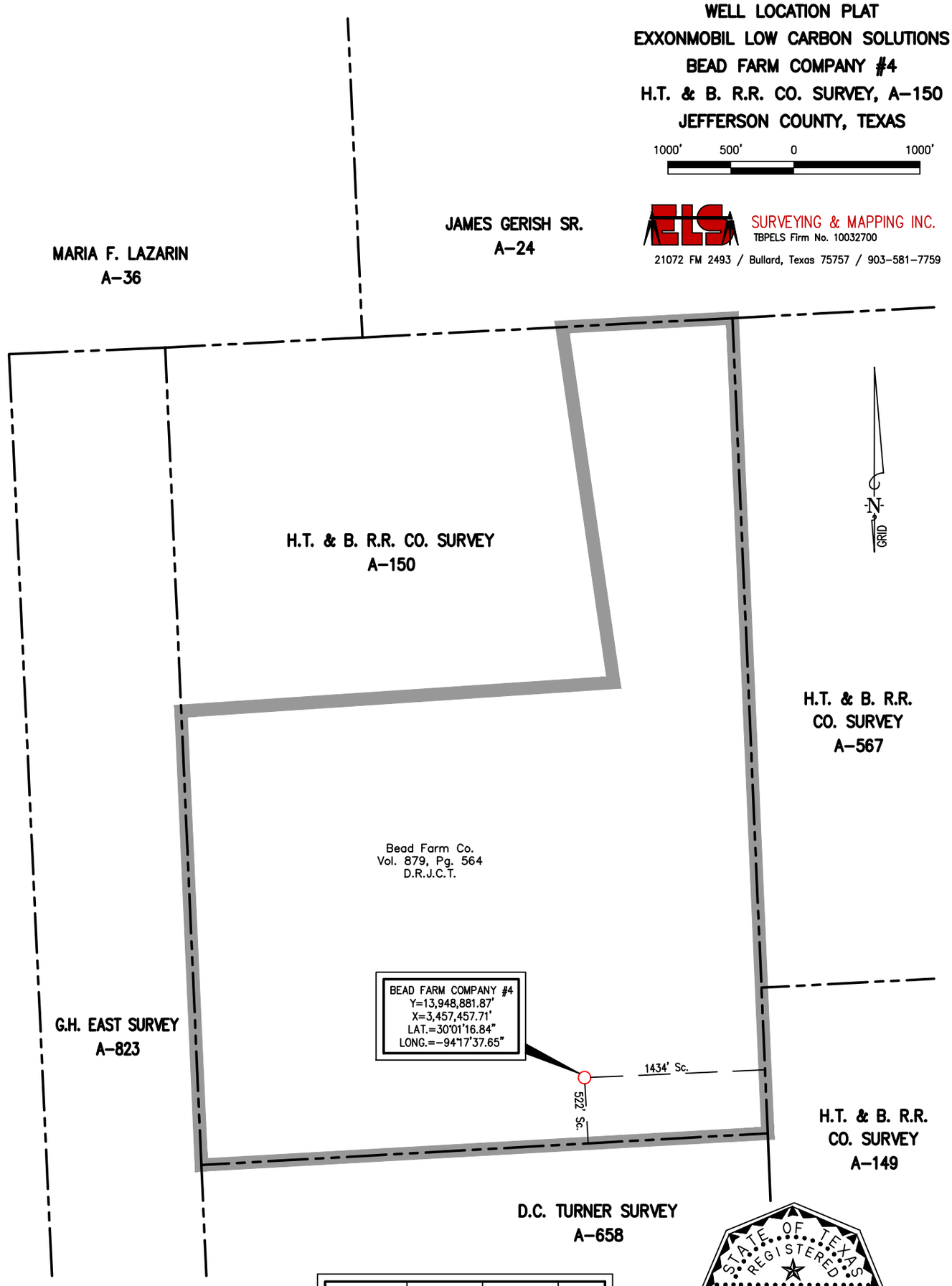
The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
BEAD FARM COMPANY #4
H.T. & B. R.R. CO. SURVEY, A-150
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

ELS SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759



SHL	TRACT CALLS	SURVEY CALLS	ELEV.
BEAD FARM COMPANY #4	522' Sc. FSL 1434' Sc. FEL	522' Sc. FSL 1434' Sc. FEL	24.0'

Location is approximately
12.3 miles SW of Beaumont, Tx.
"CHINA" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 2.8 miles turn right (North) on Green Pond Gully Road Go 1.5 miles. Turn Left (Northwest). Drive on location.

DATE SURVEYED: 5/20/2024

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data shown hereon was furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

STATE OF TEXAS REGISTERED
JIM G. GLASS
5262
PROFESSIONAL LAND SURVEYOR

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS – – – COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: May 30, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: BWT/ECJ FB 2747/36-37 Job No. 430923 Map No. J-0923-LOC-MON2

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	27 June 2024	**GAU Number:**	382934

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	
		County:	JEFFERSON
		Lease Name:	Bead Farm Company
		Lease Number:	
Operator No.:	101256	**Well Number:**	
		Total Vertical	10000
		Latitude:	30.021130
		Longitude:	-94.293605
		Datum:	NAD27

Purpose: Test Well

Location: Survey-HT&B RR CO; Abstract-150; Section-7

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

Usable-quality water occurs from the land surface to a depth of 1,100 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

This recommendation is applicable to all wells within a radius of 2,000 feet of this location.

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 06/27/2024. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 01/30/2025
Tracking No.: 326182

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-0000

WELL INFORMATION

API 42-245-32914 **County:** JEFFERSON
Well No.: 4 **RRC District** 03
Lease BEAD FARM COMPANY **Field** WILDCAT
RRC Lease 28194 **Field No.:** 00006001
Location Section: 7, Block: , Survey: HT&B RR CO, Abstract: 150

Latitude 30 **Longitud** -94
This well is 3 **miles in a** SE
direction from CHINA, TX,
which is the nearest town in the

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 10/07/2024

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	07/11/2024	901180
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 09/01/2024 **Date of first production after rig** 10/07/2024
Date plug back, deepening, drilling operation 09/01/2024 **Date plug back, deepening, recompletion, drilling operation** 10/07/2024
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 454.00 **Elevation** 24 GL
Total depth TVD 8383 **Total depth MD**
Plug back depth TVD 8283 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing Is Cementing Affidavit (Form W-15)** 25.8 Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:
Location of well, relative to nearest lease of lease on which this well is 522.0 **Feet from the** South **Line and** 1434.0 **Feet from the** East **Line of the** BEAD FARM COMPANY **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1100.0	**Date**	06/27/2024
SWR 13 Exception		**Depth**	2350.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
1	Surface	9 5/8	12 1/4	2184			H	548	1108.0	0	Circulated to Surface
2	Conventional Production	5 1/2	8 1/2	8367			H	1360	2573.5	0	Circulated to Surface

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
			/

N/A

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
1	No	L 2491	2501.0

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG)

Actual maximum pressure (PSIG) during hydraulic fracturing

fracturin

Has the hydraulic fracturing fluid disclosure been No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)

N/A

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	
CAPROCK - DISPOSAL	No			No	
SPINDLETOP SALT DOME - DISPOSAL	No			No	
FANNETT SALT DOME - DISPOSAL	No			No	
BIG HILL SALT DOME - DISPOSAL	No			No	
PLEISTOCENE-LISSIE - DISPOSAL	No			No	
MIOCENE - DISPOSAL	Yes	3436.0	3437.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6331.0	6332.0	Yes	LOGGED
MARINULINA - DISPOSAL	No			No	
HETEROSTEGINA - DISPOSAL	Yes	6030.0	6091.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS SHUT-IN. THIS WELL HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

CASING RECORD :

CEMENT PUMPING WAS NOT REQUIRED TO SET THE CONDUCTOR CASING, AS THE CONDUCTOR WAS SUCCESSFULLY SET WITHOUT THE USE OF MUD. THE WELL WAS COMPLETED WITHOUT PUMPING OR MUD CIRCULATION. CLASS A 4000 PSI CEMENT, COMBINED WITH 5/8-INCH PEA GRAVEL AND MANUFACTURED SAND, WAS POURED DOWN THE BACKSIDE TO SECURE THE CONDUCTOR.

TUBING RECORD:

PURPOSE OF WELL TO MONITOR PRESSURE AND FLUID TRENDS. U-TUBE SAMPLER, FIBER AND TEC LINE MOUNTED ON BACKSIDE OF CASING.

PRODUCING/INJECTION/DISPOSAL INTERVAL :

U-TUBE FLUID SAMPLER WITH CASING MOUNTED GUNS ON THE BACKSIDE OF THE CASING. FLUID SAMPLING INTERVAL IS FROM 2,491 FEET MD TO 2,501 FEET MD.

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION

Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	01/09/2025

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: ExxonMobil Low Carbon Solutions	**Operator P-5 No.:** 101256
Cementer Name: Halliburton	**Cementer P-5 No.:** 347151

WELL INFORMATION

District No.: 3	**County:** Jefferson	
Well No.: Bead Farm Company #4	**API No.:** 42-245-32914	**Drilling Permit No.:** 901180
Lease Name: Bead Farm Company #4	**Lease No.:**	
Field Name: Wildcat	**Field No.:**	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☒ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 12-1/4"	**Depth of drilled hole (ft.):** 2,199'	**Est. % wash-out or hole enlargement:** 10%
Size of casing in O.D. (in.): 9-5/8"	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☒ NO **If no for surface casing, explain in Remarks.**	**Setting depth shoe (ft.):** 2,184'	**Top of liner (ft.):** / **Setting depth liner (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:** September 2, 2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	372.02	A	See Remarks	883.74	~~484~~ 1,780
2	175.85	~~X~~ H	See Remarks	224.30	1,~~780~~ 404
3					
Total	547.87			1,108.04	2,184

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	**Depth of drilled hole (ft.):**	**Est. % wash-out or hole enlargement:**
Size of casing in O.D. (in.):	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Tapered string drilled hole size (in.) Upper: Lower:	**Tapered string depth of drilled hole (ft.)** Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	**Tapered string casing weight(lbs/ft) and grade** Upper: Lower:	**Tapered string no. of centralizers used** Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		**Setting depth shoe (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:**

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	**Depth of drilled hole (ft.):**	**Est. % wash-out or hole enlargement:**
Size of casing in O.D. (in.):	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Tapered string drilled hole size (in.) Upper: Lower:	**Tapered string depth of drilled hole (ft.)** Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	**Tapered string casing weight(lbs/ft) and grade** Upper: Lower:	**Tapered string no. of centralizers used** Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		**Setting depth tool (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:**

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

Primary surface cement job confirmed TOC @ 120' (via temp log and CBL conducted within 24 hrs). Top-off job perfomed with cement returns to surface. (DP 901180)

EXXONMOBIL LOW CARBON-EBUS, Bead Farm Company #4, Surface: SLURRY 1: ExtendaCem , SLURRY 2: HALCem

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

Name and title of cementer's representative	Cementing Company	Signature
Cole Folsom SERVICE Leader	Halliburton	

Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.
4920 Industrial Dr	Bossier City LA 71111	701-421-3299	9/2/24

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

Typed or printed name of operator's representative	Title	Signature
James Harvey	Operations Supervisor	James Harvey

Address	City,	State,	Zip Code	Tel: Area Code	Number	Date: mo. day yr.
22777 Springwoods Village Parkway	Spring	TX	77389	9189164340		9/2/2024

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.texas.gov/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Form W-15
Rev. 08/2014

CEMENTING REPORT

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: Exxon Mobil low Carbon Solutions	Operator P-5 No.:
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 03	County: Jefferson
Well No.: B 4	API No.: 42-245-32914 Drilling Permit No.: 901180
Lease Name: Bead Farm Company	Lease No.:
Field Name: Wildcat	Field No.:

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☑ Production

Drilled hole size (in.): 8 1/2	Depth of drilled hole (ft.): 8383	Est. % wash-out or hole enlargement: 10%
Size of casing in O.D. (in.): 5 1/2	Casing weight (lbs/ft) and grade: ~~23~~ 20, 13CR	No. of centralizers used: 188
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 8367	Top of liner (ft.):
		Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date: 9/8/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	505	H	SEE RAMARKS	921.62	1323
2	855	H	SEE REMARKS	1651.86	7047
3					
Total	1360			2573.48	8370

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXONMOBIL CORPORATION-EBUS,BEAD FARM CO,4,PRODUCTION:
SLURRY 1:CorossaCem , SLURRY 2:CorossaLOCK

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

ZOUHIR ROUBACHE	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	9/8/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James Harvey	Operations Supervisor		
Typed or printed name of operator's representative	Title	Signature	
22777 Springwood Village	Spring, TX 77389	512 949 8272	9/10/24
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON | Sperry Drilling

DGR / DIR

Powered by INSITE™

1 : 500

MD Detail Log

Country : USA
Field : WILDCAT
Location : Lat: 30° 1' 16.85" North Long: 94° 17' 37.65" West
Well : BEAD FARM COMPANY 4
Company : EXXONMOBIL LOW C SOL ON STOR LL
Rig : NABORS X33

Company	:	EXXONMOBIL LOW C SOL ON STOR LL
Rig	:	NABORS X33
Well	:	BEAD FARM COMPANY 4
Field	:	WILDCAT
Country	:	USA
API Number	:	4224532914

LOCATION

Latitude : 30° 1' 16.85" North
Longitude : 94° 17' 37.65" West

UTM X = 3,457,457.710 usft
UTM Y = 13,948,881.870 usft

Other Services

Permanent Datum : Ground Level
Elevation : 27.90 ft
Log Measured From : Drill Floor
32.52 ft Above Permanent Datum
Drilling Measured From : Drill Floor

MD LOG

Elev. KB
DF 60.42 ft
GL 27.90 ft
WD

Depth Logged : 152.50 ft To 8,383.00 ft
Date Logged : 01-Sep-24 To 05-Sep-24
Total Depth MD : 8,383.00 ft TVD : 8,381.10 ft
Spud Date : 01-Sep-24

Unit No. : N/A
Job No. : LF-XX-0909035812
Plot Type : Final
Plot Date : 20-Sep-24

Run No.	Borehole Record (MD)			Size	Casing Record (MD)		
	Size	From	To		Weight	From	To
100	12.250 in	152.50 ft	2,199.00 ft	20.000 in	78.60 lbpf	SURFACE	152.50 ft
200	8.500 in	2,199.00 ft	8,383.00 ft	9.625 in	40.00 lbpf	SURFACE	2,183.00 ft

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	01-Sep-24	05-Sep-24			
Rig Bit Number	100	200			
Bit Size (in)	12.250	8.500			
Tool Nominal OD (in)	8.150	6.750			
Log Start Depth (MD, ft)	152.50	2,199.00			
Log End Depth (MD, ft)	2,199.00	8,383.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	01-Sep-24 02:40	04-Sep-24 01:10			
Drill/Wipe End Date and Time	01-Sep-24 13:26	05-Sep-24 05:17			
Min Inc (deg) @ Depth (MD, ft)	0.18 @ 1,432.00	0.62 @ 2,928.00			
Max Inc (deg) @ Depth (MD, ft)	1.28 @ 1,717.00	2.38 @ 7,271.00			
Bit TFA(in2) / Bit Type	1.23 / HD65s	1.05 / HD65s			
Flow Rate (gpm)	700.00	600.00			
Max AV (fpm) / CV (fpm) @ MWD	80.0 / 46.0	171.0 / 350.0			
Fluid Type	Diesel Mud Base	Diesel Mud Base			
Density (ppg) / Viscosity (spqt)	9.30 / 32.00	10.25 / 67.00			
Filtrate CL (ppm)	1,300.00	57,000.00			
pH / API Filtrate (mptm)	8.10 / 8	N/A / 2			
PV (cP) / YP (lhf2)	4 / 4.00	22 / 29.00			
% Solids / % Sand	5.9 / 0	10.7 / 0			
% Oil / Oil:Water Ratio	0 / 0:100	56 / 65:35			
Rm @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A			
Rmf @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A			
Rmc @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A			
Max Tool Temp (degF) / Source	113.18 / HCIM	173.18 / HCIM			
Rm @ Max Tool Temp (degF)	N/A @ 113.18	N/A @ 173.18			
Lead MWD Engineer	Daniel Nalin	Daniel Nalin			
Customer Representative	N/A	N/A			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM			
Software Version	98.43	98.43			
Sub Serial Number	11432374	13172015			
Insert Serial Number	11753209	250429			
Date and Time Initialized	31-Aug-24 18:21	03-Sep-24 17:42			
Date and Time Read	01-Sep-24 19:40	05-Sep-24 18:56			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	19.63	58.07			
Software Version	6.43	6.43			
Sub Serial Number	11233637	11112526			
Sonde Serial Number	11902241	11902011			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	0.00	310.00			

Gamma Ray Sensor Information

Tool Type	DGR	DGR			
Distance From Bit (ft)	9.58	46.35			
Recorded Sample Period (sec)	4	4			
Software Version	N/A	N/A			
Sub Serial Number	11654485	12444096			
Insert/Sonde Serial Number	11671533	263646			

REMARKS

All depths are referenced to the driller's pipe tally.

DGXT - Gamma Ray formation exposure time

Default 1:500 Log Smoothing:
Interval Resolution: 0.5ft
Window Interval:(+/-) 0.6ft
Gap Fill: 3.0ft

Archive Name: BEAD_FARM_COMPANY_4_500MD_DETAIL_152_8383

Plot Width: 8.25 in

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division

ELECTRIC LOG STATUS REPORT

FORM L-1

Tracking No.: 326182

This facsimile L-1 was generated electronically from data submitted to the RRC.

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 10/07/2024
Field Name WILDCAT	Drilling Permit No. 901180	
Lease Name BEAD FARM COMPANY	Lease/ID No. 28194	Well No. 4
County JEFFERSON	API No. 42- 245-32914	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

Lease or ID No(s). _____

Well No(s). _____

Josh Calkin
Signature

Title

EXXONMOBIL LOW C SOL ON STOR LLC
Name (print)

(281) 702-5537
Phone

12/18/2024
Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Kristen Killen,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **September 1, 2024 to September 5, 2024** conduct or supervise the taking of Directional Surveys as follow:

- **306' to a depth of 8320' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8383'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **BEAD FARM COMPANY 4** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Kristen Killen, Log Analyst

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON
4607 HWY 90 EAST • BROUSSARD, LA 70518
PHONE 337 837 3061 • FAX 337 837 4400

September 20, 2024

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
BEAD FARM COMPANY 4
Permit No. 901180
Jefferson County, TX
API # 42-245-32914

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Kristen Killen, Log Analyst
Drainhole Number	-	Original
Surveyed Depths	-	306' – 8320' MWD Surveys performed by Sperry Drilling
Dates Performed	-	September 1, 2024 to September 5, 2024
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,

Kristen Killen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 909035812

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx_NAD83
Rose Prospect CCS
Bead Farm Company 4
4224532914
004 ST00BP00 Monitor

Design: 004 ST00BP00

Sperry Drilling Services

Geodetic Report

16 September, 2024

Well Coordinates: 4,251,627.70 N, 1,053,835.22 E (30° 01' 16.84" N, 094° 17' 37.65" W)
Ground Level: 27.90 ft

Local Coordinate Origin:	Centered on Well Bead Farm Company 4
Viewing Datum:	(32.52') Nabors X-33 @ 60.4ft (Spud)
TVDs to System:	N
North Reference:	Grid
Unit System:	API

Version: 5000.17 Build: 04

HALLIBURTON

Design Report for Bead Farm Company 4 - 004 ST00BP00

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Geographic Coordinates Latitude (ft)	Geographic Coordinates Longitude (ft)	UTM Coordinates Northing (m)	UTM Coordinates Easting (m)
0.0	0.00	0.00	0.0	0.0	0.0	30° 1' 16.845 N	94° 17' 37.650 W	4,251,627.70	1,053,835.22
306.0	0.32	198.12	306.0	-0.8	-0.3	30° 1' 16.837 N	94° 17' 37.654 W	4,251,627.45	1,053,835.14
414.0	0.47	222.63	414.0	-1.4	-0.7	30° 1' 16.831 N	94° 17' 37.658 W	4,251,627.26	1,053,835.02
502.0	0.50	238.67	502.0	-1.9	-1.2	30° 1' 16.827 N	94° 17' 37.665 W	4,251,627.12	1,053,834.84
610.0	0.56	223.44	610.0	-2.5	-2.0	30° 1' 16.821 N	94° 17' 37.674 W	4,251,626.93	1,053,834.61
684.0	0.73	217.70	684.0	-3.2	-2.5	30° 1' 16.815 N	94° 17' 37.681 W	4,251,626.74	1,053,834.45
774.0	0.71	220.18	774.0	-4.0	-3.2	30° 1' 16.806 N	94° 17' 37.689 W	4,251,626.47	1,053,834.23
862.0	0.57	228.82	862.0	-4.7	-3.9	30° 1' 16.800 N	94° 17' 37.697 W	4,251,626.25	1,053,834.02
956.0	0.64	221.03	956.0	-5.4	-4.6	30° 1' 16.793 N	94° 17' 37.705 W	4,251,626.04	1,053,833.81
1,053.0	0.68	235.33	1,053.0	-6.2	-5.5	30° 1' 16.786 N	94° 17' 37.715 W	4,251,625.81	1,053,833.56
1,149.0	0.43	209.78	1,149.0	-6.8	-6.1	30° 1' 16.780 N	94° 17' 37.723 W	4,251,625.62	1,053,833.36
1,243.0	0.31	224.36	1,243.0	-7.3	-6.5	30° 1' 16.775 N	94° 17' 37.727 W	4,251,625.47	1,053,833.25
1,335.0	0.37	83.65	1,335.0	-7.4	-6.3	30° 1' 16.774 N	94° 17' 37.726 W	4,251,625.43	1,053,833.29
1,432.0	0.18	65.07	1,432.0	-7.3	-5.9	30° 1' 16.775 N	94° 17' 37.720 W	4,251,625.46	1,053,833.43
1,527.0	0.25	159.60	1,527.0	-7.5	-5.7	30° 1' 16.773 N	94° 17' 37.718 W	4,251,625.42	1,053,833.49
1,620.0	0.57	127.86	1,620.0	-8.0	-5.2	30° 1' 16.768 N	94° 17' 37.713 W	4,251,625.27	1,053,833.62
1,717.0	1.28	135.35	1,716.9	-9.0	-4.1	30° 1' 16.757 N	94° 17' 37.701 W	4,251,624.95	1,053,833.97
1,815.0	1.23	141.72	1,814.9	-10.6	-2.7	30° 1' 16.741 N	94° 17' 37.686 W	4,251,624.46	1,053,834.40
1,907.0	1.11	133.32	1,906.9	-12.0	-1.4	30° 1' 16.727 N	94° 17' 37.672 W	4,251,624.04	1,053,834.79
1,998.0	0.78	120.21	1,997.9	-12.9	-0.2	30° 1' 16.717 N	94° 17' 37.659 W	4,251,623.76	1,053,835.15
2,092.0	0.75	133.29	2,091.9	-13.7	0.8	30° 1' 16.709 N	94° 17' 37.648 W	4,251,623.53	1,053,835.45
2,178.0	0.91	127.05	2,177.9	-14.5	1.7	30° 1' 16.701 N	94° 17' 37.637 W	4,251,623.29	1,053,835.74
2,264.0	0.88	125.11	2,263.9	-15.3	2.8	30° 1' 16.693 N	94° 17' 37.625 W	4,251,623.05	1,053,836.07
2,361.0	0.86	135.03	2,360.8	-16.2	3.9	30° 1' 16.683 N	94° 17' 37.613 W	4,251,622.76	1,053,836.41
2,451.0	0.96	152.98	2,450.8	-17.4	4.7	30° 1' 16.671 N	94° 17' 37.604 W	4,251,622.41	1,053,836.66
2,545.0	1.05	155.00	2,544.8	-18.8	5.5	30° 1' 16.656 N	94° 17' 37.597 W	4,251,621.96	1,053,836.88
2,642.0	0.89	152.80	2,641.8	-20.3	6.2	30° 1' 16.642 N	94° 17' 37.589 W	4,251,621.51	1,053,837.10
2,733.0	0.81	161.95	2,732.8	-21.6	6.7	30° 1' 16.629 N	94° 17' 37.584 W	4,251,621.13	1,053,837.26
2,830.0	0.75	164.25	2,829.8	-22.8	7.1	30° 1' 16.616 N	94° 17' 37.580 W	4,251,620.74	1,053,837.38
2,928.0	0.62	164.53	2,927.8	-23.9	7.4	30° 1' 16.605 N	94° 17' 37.577 W	4,251,620.40	1,053,837.48
3,019.0	0.63	154.06	3,018.8	-24.9	7.8	30° 1' 16.596 N	94° 17' 37.573 W	4,251,620.12	1,053,837.58
3,115.0	0.65	156.66	3,114.8	-25.8	8.2	30° 1' 16.586 N	94° 17' 37.569 W	4,251,619.82	1,053,837.72
3,207.0	0.75	162.03	3,206.8	-26.9	8.6	30° 1' 16.576 N	94° 17' 37.565 W	4,251,619.50	1,053,837.84
3,302.0	0.82	170.76	3,301.8	-28.2	8.9	30° 1' 16.563 N	94° 17' 37.562 W	4,251,619.12	1,053,837.93
3,396.0	0.81	168.40	3,395.7	-29.5	9.1	30° 1' 16.550 N	94° 17' 37.560 W	4,251,618.71	1,053,838.00
3,415.8	0.81	169.63	3,415.6	-29.7	9.2	30° 1' 16.547 N	94° 17' 37.559 W	4,251,618.63	1,053,838.02
3,490.0	0.83	174.11	3,489.7	-30.8	9.3	30° 1' 16.537 N	94° 17' 37.558 W	4,251,618.31	1,053,838.07
3,585.0	0.76	182.72	3,584.7	-32.1	9.4	30° 1' 16.524 N	94° 17' 37.558 W	4,251,617.91	1,053,838.08
3,679.0	0.75	176.68	3,678.7	-33.3	9.4	30° 1' 16.511 N	94° 17' 37.559 W	4,251,617.53	1,053,838.08
3,774.0	0.69	165.36	3,773.7	-34.5	9.6	30° 1' 16.500 N	94° 17' 37.557 W	4,251,617.17	1,053,838.14
3,867.0	0.63	187.14	3,866.7	-35.6	9.7	30° 1' 16.489 N	94° 17' 37.557 W	4,251,616.85	1,053,838.16
3,961.0	0.69	183.27	3,960.7	-36.7	9.6	30° 1' 16.479 N	94° 17' 37.558 W	4,251,616.53	1,053,838.13

Design Report for Bead Farm Company 4 - 004 ST00BP00

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	UTM Coordinates Northing (m)	UTM Coordinates Easting (m)
4,056.0	1.00	37.32	4,055.7	-36.6	10.0	30° 1' 16.479 N	94° 17' 37.553 W	4,251,616.55	1,053,838.27
4,150.0	1.12	45.72	4,149.7	-35.3	11.2	30° 1' 16.492 N	94° 17' 37.539 W	4,251,616.95	1,053,838.63
4,245.0	0.86	49.51	4,244.7	-34.2	12.4	30° 1' 16.502 N	94° 17' 37.525 W	4,251,617.29	1,053,838.99
4,434.0	0.63	55.87	4,433.7	-32.7	14.3	30° 1' 16.516 N	94° 17' 37.502 W	4,251,617.74	1,053,839.58
4,523.0	0.81	47.37	4,522.6	-32.0	15.2	30° 1' 16.523 N	94° 17' 37.492 W	4,251,617.96	1,053,839.85
4,600.0	0.93	49.95	4,599.6	-31.2	16.1	30° 1' 16.530 N	94° 17' 37.482 W	4,251,618.19	1,053,840.12
4,717.0	1.10	44.11	4,716.6	-29.8	17.6	30° 1' 16.544 N	94° 17' 37.464 W	4,251,618.62	1,053,840.58
4,813.0	1.20	50.22	4,812.6	-28.5	19.0	30° 1' 16.556 N	94° 17' 37.447 W	4,251,619.02	1,053,841.01
4,907.0	1.14	56.10	4,906.6	-27.3	20.5	30° 1' 16.567 N	94° 17' 37.429 W	4,251,619.37	1,053,841.47
5,002.0	1.30	54.06	5,001.6	-26.1	22.2	30° 1' 16.577 N	94° 17' 37.410 W	4,251,619.73	1,053,841.98
5,098.0	1.30	48.08	5,097.5	-24.8	23.9	30° 1' 16.590 N	94° 17' 37.390 W	4,251,620.14	1,053,842.50
5,192.0	1.27	65.27	5,191.5	-23.6	25.6	30° 1' 16.601 N	94° 17' 37.370 W	4,251,620.49	1,053,843.03
5,287.0	1.44	67.44	5,286.5	-22.7	27.7	30° 1' 16.609 N	94° 17' 37.346 W	4,251,620.77	1,053,843.65
5,380.0	1.58	61.93	5,379.5	-21.7	29.9	30° 1' 16.619 N	94° 17' 37.321 W	4,251,621.09	1,053,844.33
5,475.0	1.41	332.54	5,474.4	-20.0	30.5	30° 1' 16.635 N	94° 17' 37.313 W	4,251,621.59	1,053,844.51
5,570.0	1.54	324.88	5,569.4	-17.9	29.2	30° 1' 16.656 N	94° 17' 37.326 W	4,251,622.23	1,053,844.13
5,664.0	1.65	324.88	5,663.4	-15.8	27.7	30° 1' 16.678 N	94° 17' 37.342 W	4,251,622.88	1,053,843.67
5,758.0	1.72	324.00	5,757.3	-13.6	26.1	30° 1' 16.700 N	94° 17' 37.360 W	4,251,623.56	1,053,843.18
5,852.0	1.59	327.25	5,851.3	-11.3	24.6	30° 1' 16.723 N	94° 17' 37.376 W	4,251,624.25	1,053,842.71
5,947.0	1.76	326.45	5,946.2	-9.0	23.1	30° 1' 16.747 N	94° 17' 37.392 W	4,251,624.95	1,053,842.25
6,042.0	1.83	325.28	6,041.2	-6.5	21.4	30° 1' 16.772 N	94° 17' 37.410 W	4,251,625.70	1,053,841.74
6,136.0	1.55	320.67	6,135.2	-4.3	19.7	30° 1' 16.794 N	94° 17' 37.428 W	4,251,626.38	1,053,841.23
6,230.0	1.74	328.51	6,229.1	-2.1	18.2	30° 1' 16.817 N	94° 17' 37.445 W	4,251,627.05	1,053,840.76
6,325.0	1.67	328.65	6,324.1	0.3	16.7	30° 1' 16.841 N	94° 17' 37.460 W	4,251,627.79	1,053,840.31
6,419.0	1.61	334.63	6,418.0	2.7	15.4	30° 1' 16.865 N	94° 17' 37.474 W	4,251,628.51	1,053,839.92
6,514.0	1.72	331.62	6,513.0	5.1	14.2	30° 1' 16.890 N	94° 17' 37.487 W	4,251,629.26	1,053,839.54
6,609.0	1.67	330.10	6,608.0	7.6	12.8	30° 1' 16.915 N	94° 17' 37.501 W	4,251,630.00	1,053,839.12
6,703.0	1.84	340.46	6,701.9	10.2	11.6	30° 1' 16.941 N	94° 17' 37.514 W	4,251,630.80	1,053,838.76
6,797.0	1.98	336.67	6,795.9	13.1	10.5	30° 1' 16.970 N	94° 17' 37.525 W	4,251,631.69	1,053,838.41
6,893.0	2.28	321.94	6,891.8	16.1	8.6	30° 1' 17.001 N	94° 17' 37.545 W	4,251,632.61	1,053,837.85
6,987.0	2.20	322.22	6,985.7	19.0	6.4	30° 1' 17.031 N	94° 17' 37.569 W	4,251,633.49	1,053,837.16
7,081.0	2.13	327.85	7,079.7	21.9	4.3	30° 1' 17.060 N	94° 17' 37.591 W	4,251,634.38	1,053,836.54
7,176.0	2.19	330.29	7,174.6	25.0	2.5	30° 1' 17.091 N	94° 17' 37.610 W	4,251,635.32	1,053,835.98
7,271.0	2.38	329.87	7,269.5	28.3	0.6	30° 1' 17.124 N	94° 17' 37.630 W	4,251,636.32	1,053,835.41
7,365.0	2.32	329.24	7,363.4	31.6	-1.3	30° 1' 17.158 N	94° 17' 37.651 W	4,251,637.33	1,053,834.81
7,459.0	2.04	328.07	7,457.4	34.7	-3.2	30° 1' 17.189 N	94° 17' 37.671 W	4,251,638.26	1,053,834.24
7,554.0	1.11	302.87	7,552.3	36.6	-4.9	30° 1' 17.209 N	94° 17' 37.689 W	4,251,638.85	1,053,833.74
7,648.0	1.06	286.01	7,646.3	37.3	-6.5	30° 1' 17.217 N	94° 17' 37.707 W	4,251,639.07	1,053,833.25
7,743.0	1.05	266.73	7,741.3	37.5	-8.2	30° 1' 17.219 N	94° 17' 37.726 W	4,251,639.13	1,053,832.73
7,838.0	0.93	267.08	7,836.3	37.4	-9.8	30° 1' 17.219 N	94° 17' 37.745 W	4,251,639.11	1,053,832.23
7,933.0	1.31	273.72	7,931.3	37.5	-11.7	30° 1' 17.220 N	94° 17' 37.766 W	4,251,639.11	1,053,831.66
8,028.0	1.54	274.02	8,026.2	37.6	-14.0	30° 1' 17.223 N	94° 17' 37.792 W	4,251,639.16	1,053,830.94

Design Report for Bead Farm Company 4 - 004 ST00BP00

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	UTM Coordinates Northing (m)	UTM Coordinates Easting (m)
8,122.0	1.54	272.79	8,120.2	37.8	-16.5	30° 1' 17.225 N	94° 17' 37.821 W	4,251,639.21	1,053,830.17
8,216.0	1.42	278.74	8,214.2	38.0	-19.0	30° 1' 17.228 N	94° 17' 37.848 W	4,251,639.28	1,053,829.44
8,320.0	1.48	303.75	8,318.1	38.9	-21.3	30° 1' 17.239 N	94° 17' 37.875 W	4,251,639.57	1,053,828.71
8,383.0	1.48	303.75	8,381.1	39.9	-22.7	30° 1' 17.248 N	94° 17' 37.890 W	4,251,639.84	1,053,828.30

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
8,383.0	8,381.1	39.9	-22.7	Proj. to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	0.00	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
306.0	2,178.0	01 HAL MWD (MagVarMS) 12 1/4" Hole 306' - 2178'	3_MWD+HRGM+MS
2,264.0	8,320.0	02 HAL MWD (MagVarMS) 8 1/2" Hole 2264' - 8320'	3_MWD+HRGM+MS

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
152.5	152.5	20" Conductor Casing	20.000	20.000
2,184.0	2,183.9	9-5/8" Surface Casing	9.625	12.250
8,367.5	8,365.6	5-1/2" Production Casing	5.500	8.500

Design Report for Bead Farm Company 4 - 004 ST00BP00

Targets for 004 ST00BP00 Monitor

Shape	Target Name	TVD (ft)	Northing (m)	Easting (m)	+N/-S ft	+E/-W ft	Created	Updated
Polygon	Rose2 T. Fleming SD Rect. 400'	3,562.0	4,248,251.97	1,053,561.35	-11,075.2	-898.5	5/13/2024	7/5/2024
Polygon	Rose1 T. Fleming SD Rect. 400'	3,508.3	4,249,261.67	1,054,768.97	-7,762.6	3,063.5	5/13/2024	6/17/2024
Polygon	Rose BF4 T. Fleming SD Rect. 150'	3,416.0	4,251,627.70	1,053,835.22	0.0	0.0	7/30/2024	8/29/2024

North Reference Sheet for Rose Prospect CCS - Bead Farm Company 4 - 004 ST00BP00 Monitor

All data is in Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 60.4ft (Spud). Northing and Easting are relative to Bead Farm Company 4

Coordinate System is US State Plane 1983, Texas South Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 600,000.00m, False Northing: 4,000,000.00m, Scale Reduction: 0.99993482

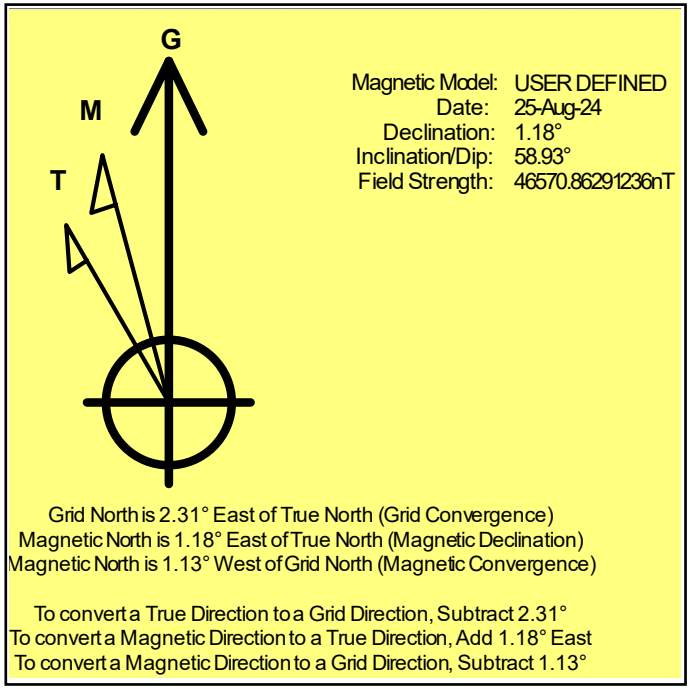
Grid Coordinates of Well: 4,251,627.70 m N, 1,053,835.22 m E

Geographical Coordinates of Well: 30° 01' 16.84" N, 094° 17' 37.65" W

Grid Convergence at Surface is: 2.31°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,383.02ft

the Bottom Hole Displacement is 45.86ft in the Direction of 330.33° (Grid).
Magnetic Convergence at surface is: 1.13° (25 August 2024, , User Defined)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
901180	Jul 11, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32914	Jul 10, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	454

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM COMPANY	4
LOCATION	**TOTAL DEPTH**
3 miles SE direction from CHINA, TX	10000

Section, Block and/or Survey

SECTION 7 BLOCK ABSTRACT 150

SURVEY HT&B RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
522 ft. SOUTH 1434 ft. EAST	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
522 ft. SOUTH 1434 ft. EAST	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	454.00	10,000	4	03
BEAD FARM COMPANY			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
BEAD FARM COMPANY #4
H.T. & B. R.R. CO. SURVEY, A-150
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

ELS SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759

MARIA F. LAZARIN
A-36

JAMES GERISH SR.
A-24

BHL: ST00
MD: 8320.00
TVD: 8318.10
From Surf Location:
17.239 N
37.890 W

H.T. & B. R.R. CO. SURVEY
A-150

GRID N

H.T. & B. R.R.
CO. SURVEY
A-567

SPERRY DRILLING JOB NO. 909035812
DATE SURVEYED September 5, 2024
SURVEYED FROM 306' TO 8320'
TIE-ON COORDINATES FROM Surface
BHL AT 8383.00 FT. (MD) = 45.86 FT.
AT 330.33° * Grid
FROM SURFACE LOCATION NW
BHL ____ = TO NW LEASE LINE

Bead Farm Co.
Vol. 879, Pg. 564
D.R.J.C.T.

BEAD FARM COMPANY #4
Y=13,948,881.87'
X=3,457,457.71'
LAT.=30°01'16.84"
LONG.=-94°17'37.65"

1434' Sc.

522' Sc.

G.H. EAST SURVEY
A-823

H.T. & B. R.R.
CO. SURVEY
A-149

D.C. TURNER SURVEY
A-658

SHL	TRACT CALLS	SURVEY CALLS	ELEV.
BEAD FARM COMPANY #4	522' Sc. FSL 1434' Sc. FEL	522' Sc. FSL 1434' Sc. FEL	24.0'

STATE OF TEXAS REGISTERED
JIM G. GLASS
5262
PROFESSIONAL LAND SURVEYOR

Location is approximately
12.3 miles SW of Beaumont, Tx.
"CHINA" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 2.8 miles turn right (North) on Green Pond Gully Road Go 1.5 miles. Turn Left (Northwest). Drive on location.

DATE SURVEYED: 5/20/2024

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data shown hereon was furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS – – – COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: May 30, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: BWT/ECJ FB 2747/36-37 Job No. 430923 Map No. J-0923-LOC-MON2

CONFIDENTIAL BUSINESS INFORMATION

CHRISTI CRADDICK, CHAIRMAN
WAYNE CHRISTIAN, COMMISSIONER
JIM WRIGHT, COMMISSIONER

DANNY SORRELLS
DIRECTOR, OIL AND GAS DIVISION
PETER FISHER, P.G.
DISTRICT DIRECTOR

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

OPERATOR Name:	EXXONMOBIL LOW C SOL ON	**RE:**	**Lease:**	BEAD FARM COMPANY
Address1:	ATTN EDWARD E GRAHAM			
Address2:	22777 SPRINGWOODS VILLAGE PKWY	**Well No:**	4	
City:	SPRING	**Sec:**	7	**Block:**
State:	TX	**County:**	JEFFERSON	
		Survey Name:	HT&B RR CO	

SWR13EX Application Number: 132309 **Drilling Permit No:** 901180

SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for **LEASE** BEAD FARM COMPANY ; **WELL** 4 has been approved by the Railroad Commission of Texas District Office.

a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.

b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.

c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.

d. The casing and cement program shall adhere to the following specifications:

Set 2350 feet of surface casing and circulate cement from the shoe to the ground surface.

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted 07/18/2024 .
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: AUDREY KUKLENZ DATE: 07/22/2024

PETER FISHER, P.G.

DISTRICT DIRECTOR

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

22777 Springwoods Parkway
Spring, Texas 77389

To whom it may concern,

This notice is to inform that the Bead Farm Company #4 well (API# 42-245-32914), located in Jefferson County, Texas, will be converted into a monitoring well. The well has been equipped with the with the following instrumentation:

- Electric line (TEC) from surface to a well depth of 7,787 feet MD with pressure and temperature sensors installed intermittently from 3,347 feet MD to 7,787 feet MD.
- Fiber optic pressure and temperature gauge sensor at 2,475 feet MD.
- U-tube fluid sampler with casing mounted guns. The perforation interval for fluid sampling is from 2,491 feet MD to 2,501 feet MD.
- Fiber optic cable from the surface to a well depth of 8,234 feet MD.

All the above equipment was installed on the exterior of the production casing and cemented in place. There are no perforations through the casing.

Regards,

DocuSigned by:
Jonathan Rodriguez
D38AA01693BB4EE...

Jonathan Rodriguez
Completion Advisor
ExxonMobil

CONFIDENTIAL BUSINESS INFORMATION

docusign

Certificate Of Completion

Envelope Id: 28E2F290-FB72-40D0-AA8F-30274455EBC0
Status: Completed
Subject: Complete with Docusign: W2 Monitor Well Statement V2.pdf
Source Envelope:
Document Pages: 1
Signatures: 1
Envelope Originator:
Certificate Pages: 2
Initials: 0
WILLIAM Carr
AutoNav: Enabled
Address Redacted
EnvelopeId Stamping: Disabled
william.j.carr@exxonmobil.com
Time Zone: (UTC-06:00) Central Time (US & Canada)
IP Address: 136.228.238.182

Record Tracking

Status: Original
12/23/2024 2:53:49 PM
Holder: WILLIAM Carr
william.j.carr@exxonmobil.com
Location: DocuSign
Security Appliance Status: Connected
Pool: Main SecApp 1

Signer Events	Signature	Timestamp
Jonathan Rodriguez jonathan.a.rodriguez@exxonmobil.com ExxonMobil General Security Level: Email, Account Authentication (None)	DocuSigned by: Jonathan Rodriguez D38AA01693BB4EE... Signature Adoption: Pre-selected Style Using IP Address: 136.228.238.73	Sent: 12/23/2024 2:54:34 PM Viewed: 12/23/2024 2:55:37 PM Signed: 12/23/2024 2:55:47 PM

Electronic Record and Signature Disclosure:
Accepted: 7/12/2022 6:18:31 AM
ID: 24c3aed4-aea4-42d2-a30a-2d53609eb06c
Company Name: Exxon Mobil Corporation

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	12/23/2024 2:54:34 PM
Certified Delivered	Security Checked	12/23/2024 2:55:37 PM
Signing Complete	Security Checked	12/23/2024 2:55:47 PM
Completed	Security Checked	12/23/2024 2:55:47 PM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

Electronic Record and Signature Disclosure created on: 2/24/2022 12:08:30 AM
Parties agreed to: Jonathan Rodriguez

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- I am authorized to do the specific type of work (approve, endorse, etc.) in the country where I am physically located when using DocuSign

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CONFIDENTIAL BUSINESS INFORMATION

4224502193 Broussard JE Jr-1

CONFIDENTIAL BUSINESS INFORMATION

Scout Ticket

Wed May 07, 2025

42245021930000

General Information

1 BROUSSARD J E JR

Data Source:	PI	**Country:**	UNITED STATES
API/UWI:	42245021930000	**IC:**	
State/Prov:	TEXAS	**County:**	JEFFERSON
Field:	WILDCAT	**Operator:**	GROUP OIL CO THE
Current Status:		**Current Operator:**	GROUP OIL CO THE
Reg. Well Status/Date:			
Initial Class:	NEW FIELD WILDCAT (WF)	**Final Well Class:**	NEW FIELD WILDCAT-DRY (INCLUDING TEMPORARILY ABANDONED WELL) (WF)
Final Status:	DRY & ABANDONED	**Target Objective:**	O&G
Permit:	on Jan 31, 1958 APPROVED	**Hole Direction:**	VERTICAL
First Report Date:	Feb 15, 1958	**Abandonment Date:**	
Projected TD:	9,200 FT	**Projected Formation:**	FRIO
Basin:	GULF COAST BASIN	**Formation at TD:**	UNKNOWN
		PRODFit Form at TD:	
Play Name:	SOUTH TEXAS CONVENTIONAL	**Play Type:**	CONVENTIONAL ONSHORE (CONV ONSHR)

Location

Footage NS EW Origin:	1665 FN 1063 FW TX SUR/POR/GRANT			**Data Source:**	PI
Dist, Abs, Survey:	RR DISTRICT 03 874	T&NO RR CO			
Blk, Lge, Lot, Labor:					
Township, Section:	42				
Surface Co-ord:	+3491224.9 FT +816342.61 FT			**Data Source:**	PI
Lat/Long:	+29.9960500 -94.2861200	**Lat/Long Source:**	TS	**Datum:**	NAD27

Location Narrative

Data Source	Type	Remark
PI	LEASE_UNIT	1665 FN 1063 FW
PI	DST_TOWN	4 MI SW CHINA, TX
PI	LOCATION	RESURVEYED: FTG CHGD FROM 1650 FNL 1320 FWL OF SUR
PI	SCALED_FOOT	REGULATORY
PI	LOCATION	ALTERNATE SURVEY NAME: STARK W L
PI	LOCATION	SPOTTED WITH PLAT PROPOSED LAT/LONG

Dates and Depths

Data Source:	PI		
Spud:	Feb 10, 1958	**Spud Date Code:**	A
TD:	9,050 FT	**TD Date:**	
TVD:		**PlugBack Depth:**	
Formation Code TD:	000UNKWN	**Formation Name TD:**	UNKNOWN
PRODFit Form Code TD:		**PRODFit Form Name TD:**	
Ref. Elevation:	35 FT DF	**KB. Elevation:**	
Ground Elevation:	25 FT GR	**LTD:**	9,048 FT
Contractor:			
Completed:	Feb 26, 1958	**Final Drilling:**	
Rig Release Date:		**Rig #:**	
Tool:			

Casing, Liner, Tubing

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Scout Ticket

Wed May 07, 2025

Casing	Data Source	Size	Base Depth		Cement	PRODFit Top Formation Code	PRODFit Base Formation Code
CASING	PI	10 3/4 IN	1,019	FT			

Drilling Journal

Lease Acres

Lease Acres: 600 ACRE

Participating Interests Journal

Nbr	Data Source	Remark
1	PI	PART INTERESTS- SUN F/O
2	PI	WEAVER CARNES W

Logs

Log	Data Source	Type	Top Depth	Base Depth	Logging Co.	BHT	since circ.
1	PI	EL	0	8,911	153789		
2	PI	EL	0	9,048	153789		

Dwights Energydata Narrative

Accumulated through 1997

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CONFIDENTIAL BUSINESS INFORMATION

245-02193

Please Refer to
File No

RAILROAD COMMISSION OF TEXAS
OIL AND GAS DIVISION

Form 4
Plugging Rec

FILE IN DUPLICATE WITH DEPUTY SUPERVISOR OF DISTRICT IN WHICH WELL IS LOCATED

The Company Group Oil Company - Carnes W. Weaver Address 326 Gulf Building, Houston 2, Texas

Sec No. 42 A-874 Block No. Survey W. L. Stark County Jefferson Co., Texas

Well No. 1 Name of Lease Broussard et al No. of Acres 581

Name of Field in which well is located S. China Date well was plugged Feb. 26, 1958

Form 1 (Notice of Intention to Drill) Was Filed in Name of The Group Oil Company - Carnes W. Weaver

Character of well at the time of completion Oil (Initial Production) bbls; Gas (Initial Production) Cu. Ft., Dry XXX

Amount well producing when plugged Oil bbls. Gas Cu. Ft., Water bbls

Has this well ever produced oil or gas? No

Total Depth 9050 feet. Top of each producing sand None feet

Was the well filled with mud laden fluid according to regulations of the Railroad Commission? Yes

How was mud applied? Hole was filled with 11# mud

Were plugs used? Yes If so show all shoulders left for casing, depth of each, and size of casing size and kind of plugs used and depth placed Also amount of cement and rock Was well shot? A cement plug of 150' was placed at the bottom of the surface casing 90' in the casing, 60' in the 8-3/4" open hole

SIZE PIPE	PUT IN WELL Ft	In	PULLED OUT Ft	In	LEFT IN WELL Ft	In	PACKERS AND SHOES
10-3/4	1011		-		1011		Baker Shoe

Show depth found and thickness of all water, oil and gas formations None

Have all abandoned wells on this lease been plugged according to Commissions rules? X Yes

Manner of confining all oil gas or water to strata Water sands have been cased off with 10-3/4" surface casing

The names of adjacent lease, royalty and landowners with their addresses in each instance as follows:

Sun Oil Company - San Jacinto Building - Beaumont, Texas

Was notice given before plugging to all available adjacent lease owners as required by Rule 10? Yes

I, Carnes W. Weaver being first duly sworn on oath, state that I have knowledge of the facts and the matters [illegible] the same are true and correct.

Carnes W. Weaver Title Owner

Subscribed and sworn to before me this 27th day of February, 1958

Notary Public MARY JANE CARVEL Jefferson County, Texas

RECEIVED
MAR -4
Railroad Commission of Texas
OIL & GAS DIVISION
HOUSTON, TEXAS

Correspondence regarding this well should be addressed to:

Name Carnes W. Weaver Address 326 Gulf Building, Houston 2, Texas

DR

CONFIDENTIAL BUSINESS INFORMATION

Please Refer to File No.

RAILROAD COMMISSION OF TEXAS
OIL AND GAS DIVISION

Form 24
Application To Plug and Well Record

FILE IN DUPLICATE WITH DEPUTY SUPERVISOR OF DISTRICT IN WHICH WELL IS LOCATED FIVE FULL DAYS PRIOR TO PLUGGING

Company The Group Oil Company - Carnes W. Weaver Address 326 Gulf Building, Houston 2, Texas

Rec. No. 42 A-874 Block No. ___ Survey W. L. Stark County Jefferson Co., Texas

Well No. 1 Name of Lease Broussard et al No. of Acres 581 Elev. 35 DF 25 GR

Name of Field in which well is located S. China

Located 6-1/10 Miles East Direction from None (Nearest P. O. or Town)

Form 1, "Notice of Intention to Drill," was filed in name of The Group Oil Company - Carnes W. Weaver

Drilling Commenced February 10, 1958 Drilling Completed February 26, 1958

Has this well ever produced Oil? No or Gas? No

Character of Well (Oil, Gas or Dry) - Total Depth 9050

Date you wish to Plug February 26, 1958.

Name of Party Plugging Well HOWCO Address Beaumont, Texas

Correspondence regarding this well should be sent to: Name Carnes W. Weaver

Address 326 Gulf Building, Houston 2, Texas

Initial Production of Gas: Volume (MCF) - 24 hrs. Pressure - lbs. per square inch

Initial Production of Oil: Barrels -

Give notice before Plugging to all available Lease Owners, as required by Rule (10).

When Plugging completed, file final Plugging Report, duly signed and sworn to. All necessary forms will be furnished by the Deputy Supervisor of district in which well is located.

NOTE: If no log available, so state and give all information that can be obtained to as total depth, whether or not cemented, productive formation, water sands, and as near as possible date well was drilled.

General Remarks:

RECEIVED
MAR - 4
Railroad Commission of Texas
OIL & GAS DIVISION
HOUSTON, TEXAS

...TION AND AFFIDAVIT ON REVERSE SIDE

CONFIDENTIAL BUSINESS INFORMATION

FORMATION RECORD

Show All Formations Especially All Sands and Character and Contents Thereof

Formation	From	To
Sand interbedded with sh.	1011	2700
Shale	2700	2850
Sand	2850	2900
Shale	2900	2970
Sand	2970	3000
Shale	3000	3320
Sand with shale streaks	3320	4000
Shale	4000	4200
Sand	4200	4230
Shale	4230	4310
Sand with shale streaks	4310	6100
Shale	6100	6700
Sand with shale streaks	6700	7700
Shale	7700	7870
Sand	7870	7950
Shale	7950	8030
Sand	8030	8080
Shale	8080	8290
Sand interbedded with sh.	8290	8470
Shale	8470	9050

RECEIVED
MAR - 6 1958
Railroad Commission of Texas
OIL & GAS DIVISION
AUSTIN, TEXAS

Method of shutting off water: Surface casing

Amount of water with oil: None

Is water completely shut off? Yes

per cent

I, Carnes W. Weaver being first duly sworn on oath state that I have knowledge of the facts and matter hereinabove set forth and that the same are true and correct.

Representative of Company.

Subscribed and sworn to before me this 26th day of February, 1958.

MARY JANE CAR...

Notary Public ... County, Texas.

CONFIDENTIAL BUSINESS INFORMATION

Please refer to File No.

Form 1

RAILROAD COMMISSION OF TEXAS
OIL AND GAS DIVISION

APPLICATION TO DRILL, DEEPEN OR PLUG BACK

IS THIS AN APPLICATION TO DRILL, DEEPEN OR PLUG BACK

FILE IN DUPLICATE WITH DEPUTY SUPERVISOR OF DISTRICT IN WHICH WELL IS LOCATED

READ CAREFULLY AND COMPLY FULLY

In order that it may be ascertained whether or not the proposed location covered by this notice conforms to the applicable spacing regulations set down by the Railroad Commission, there are two important footages that must be shown, that is, THE NEAREST DISTANCE OF PROPOSED LOCATION FROM LEASE OR PROPERTY LINE AND DISTANCE OF PROPOSED LOCATION FROM THE NEAREST WELL ON THE SAME LEASE. Do not begin drilling operations on any location prior to filing Form 1 and until permit granted by the Commission has been received and waiting clause period has terminated.

For the purpose of this determination draw on the back of this sheet a neat accurate sketch, made to scale of the lease, block or lot including thereon the proposed well for this location with reference to the two nearest lease lines. Also show the nearest wells on all sides of this location and the distance from the proposed location to these wells. In addition to the foregoing, the following designations must be shown for each producing well on the lease and shall include producing wells on the location herein applied for showing the name of the well assigned this well. Give names and addresses of adjoining lease or property owners and designate all property by lease and company name. You may attach a blue print showing this information if you so desire.

DO NOT CONFUSE SURVEY LINES WITH LEASE LINES. IF THE SKETCH OR BLUE PRINT SHOWS ONLY A SECTION, BLOCK, OR LOT PART OF YOUR LEASE, DESIGNATE SAME AS BEING ONLY THAT PART OF THE LEASE.

Where the size of the plat will permit, use scale of one inch equaling 1000 feet. If less than 2 acres use scale of one inch equaling 100 feet. DESIGNATE SCALE TO WHICH PLAT OR SKETCH IS DRAWN. ALSO DESIGNATE NORTHERLY DIRECTION ON THE SKETCH OR PLAT.

FILL IN BELOW IN THE SPACES RESERVED FOR THIS PURPOSE THE FOOTAGES ASKED FOR.

Nearest distance from proposed location to property or lease line: 1320 feet

Distance from proposed location to nearest drilling, completed, or applied for well on same lease: ... feet

Date: JANUARY 29 58

Name of company or operator:

Name: THE GROUP OIL CO.-CARNES W. WEAVER

Address: 326 GULF BLDG.

City: HOUSTON, TEXAS

Description of farm or lease:

Name of lease: J. R. BROUSSARD, JR. ET AL

Number of acres: 581 Well No.: 1

Number of wells on lease: NONE

Survey: W. L. STARK

Elevation: ... feet (above sea level)

Section No.: 42, AB. 874 Block No.: ...

Located in: WILDCAT (Field)

(If Wildcat state above)

JEFFERSON County

6-1/10 Miles EAST Direction from

NONE nearest postoffice of town

Rotary or Cable Tools: ROTARY

Date work will start drilling: IMMEDIATELY

Depth to which you propose to drill: 9200 feet

Date work will start deepening: ...

IF LEASE PURCHASED WITH ONE OR MORE WELLS DRILLED, FROM WHOM PURCHASED?

Name: ...

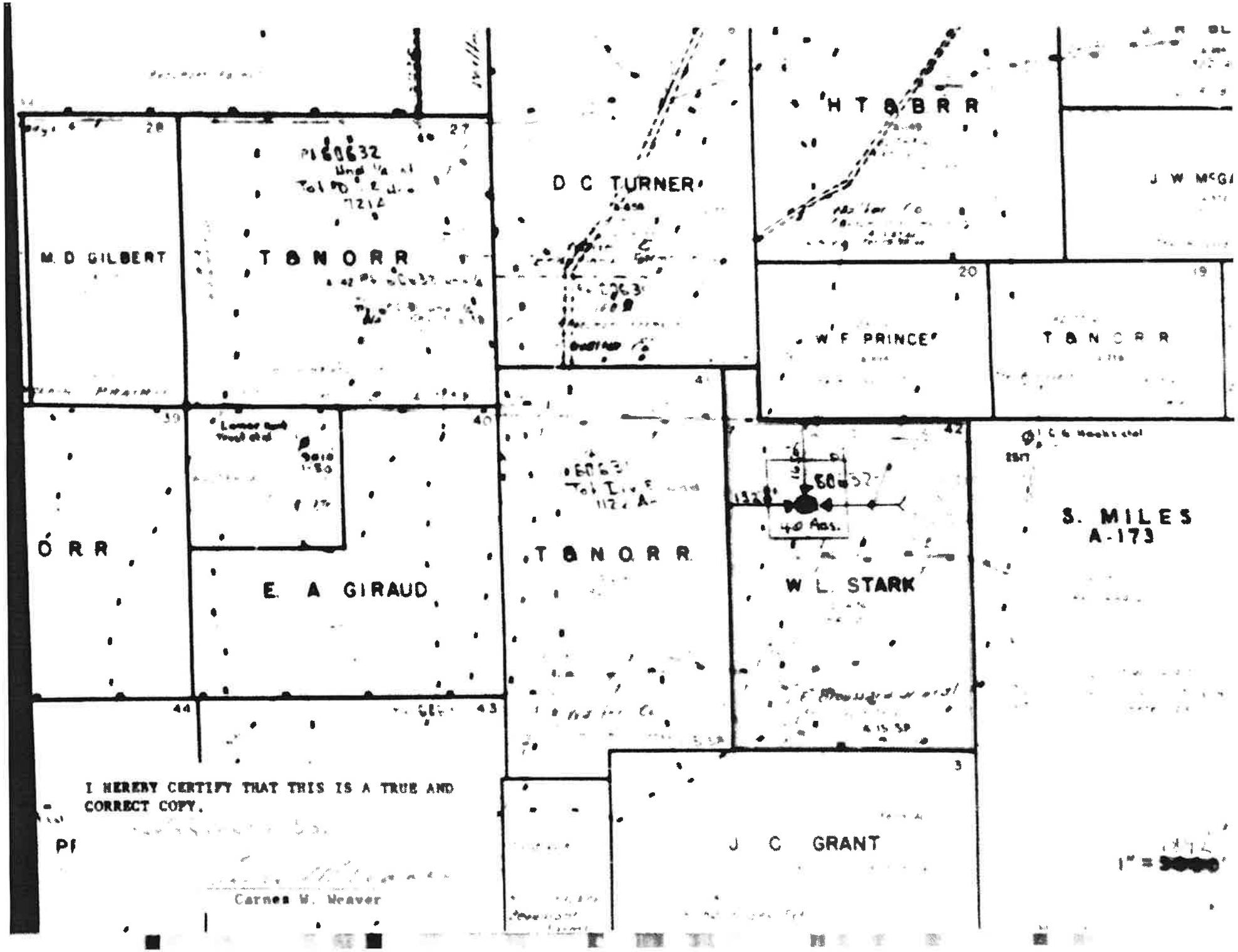
Address: ...

NOTICE: Before sending in this form be sure that you have given all information required. Much unnecessary correspondence will thus be avoided.

DRAW SKETCH AND MAKE AFFIDAVIT ON REVERSE SIDE

RECEIVED
[illegible]
Railroad Commission of Texas
OIL & GAS DIVISION
HOUSTON, TEXAS

DR



CONFIDENTIAL BUSINESS INFORMATION

CONFIDENTIAL BUSINESS INFORMATION

4224502194 Broussard J. E. Etal-1

Scout Ticket

Tue Apr 04, 2023

42245021940000

General Information

1 BROUSSARD J E

Data Source:	PI	**Country:**	UNITED STATES
API/UWI:	42245021940000	**IC:**	
State/Prov:	TEXAS	**County:**	JEFFERSON
Field:	WILDCAT	**Operator:**	HOOK CHAS ETAL
Current Status:		**Current Operator:**	HOOK CHAS ETAL
Reg. Well Status/Date:			
Initial Class:	NEW FIELD WILDCAT (WF)	**Final Well Class:**	NEW FIELD WILDCAT-DRY (INCLUDING TEMPORARILY ABANDONED WELL) (WF)
Final Status:	DRY & ABANDONED	**Target Objective:**	
Permit:	on Jan 01, 1801	**Hole Direction:**	VERTICAL
First Report Date:	Nov 15, 1910	**Abandonment Date:**	
Projected TD:		**Projected Formation:**	
Basin:	GULF COAST BASIN	**Formation at TD:**	UNKNOWN
		PRODFit Form at TD:	
Play Name:	MISC GULF COAST BASIN	**Play Type:**	CONVENTIONAL ONSHORE (CONV ONSHR)

Location

Footage NS EW Origin: **Data Source:** PI

Dist, Abs, Survey: RR DISTRICT 03 173 MILES SARAH

Blk, Lge, Lot, Labor:

Township, Section:

Lat/Long: +29.9997346 -94.2777770 **Lat/Long Source:** IH **Datum:** NAD27

Location Narrative

Data Source	Type	Remark
PI	LOCATION	350 VRS E WL 300 S NL SUR

Dates and Depths

Data Source:	PI		
Spud:	Jan 01, 1801	**Spud Date Code:**	E
TD:	2,518 FT	**TD Date:**	
TVD:		**PlugBack Depth:**	
Formation Code TD:	000UNKWN	**Formation Name TD:**	UNKNOWN
PRODFit Form Code TD:		**PRODFit Form Name TD:**	

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CONFIDENTIAL BUSINESS INFORMATION

Scout Ticket

Tue Apr 04, 2023

Ref. Elevation:		**KB. Elevation:**	
Ground Elevation:	21 FT EG	**LTD:**	
Contractor:			
Completed:	Jan 01, 1801	**Final Drilling:**	
Rig Release Date:		**Rig #:**	
Tool:			

Casing, Liner, Tubing

Narrative	Data Source	Type	Remark
	PI	CASING	NO CSG RPTD

Drilling Journal

Show

Obs	Data Source	Top Depth	Base Depth	Type	Top Form	Base Form	Sample
1	PI	2,518	2,518	WET			

Logs

Log	Data Source	Type	Top Depth	Base Depth	Logging Co.	BHT	since circ.
1	PI	EL					

Dwights Energydata Narrative

Accumulated through 1997

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CONFIDENTIAL BUSINESS INFORMATION

4224532914 Bead Farm Company 4 (In-Zone Monitoring Well)

CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32914
Drilling Permit # 901180
SWR Exception

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256

2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC

3. Operator Address (include street, city, state, zip):
ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

4. Lease Name: BEAD FARM COMPANY

5. Well No.: 4

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 10000

9. Do you have the right to develop the minerals under any right-of-way ? [ ] Yes [X] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03

12. County: JEFFERSON

13. Surface Location [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 3 miles in a SE direction from China, TX which is the nearest town in the county of the well site.

15. Section: 7

16. Block:

17. Survey: HT&B RR CO

18. Abstract No.: A-150

19. Distance to nearest lease line: ft.

20. Number of contiguous acres in lease, pooled unit, or unitized tract: 454

21. Lease Perpendiculars: 522 ft from the SOUTH line and 1434 ft from the EAST line.

22. Survey Perpendiculars: 522 ft from the SOUTH line and 1434 ft from the EAST line.

23. Is this a pooled unit? [ ] Yes [X] No

24. Unitization Docket No:

25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	10000	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks

Certificate:

I certify that information stated in this application is true and complete, to the best of my knowledge.

Josh Calkin — Name of filer
Jul 10, 2024 — Date submitted

(281)702-5537 — Phone
Josh.Calkin@erm.com — E-mail Address (OPTIONAL)

RRC Use Only Data Validation Time Stamp: Mar 26, 2025 1:05 PM(Current Version)

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
901180	Jul 11, 2024	* 03
API NUMBER	FORM W-1 RECEIVED	COUNTY
42-245-32914	Jul 10, 2024	JEFFERSON
TYPE OF OPERATION	WELLBORE PROFILE(S)	ACRES
NEW DRILL	Vertical	454

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

NOTICE
This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.
District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM COMPANY	4
LOCATION	TOTAL DEPTH
3 miles SE direction from CHINA, TX	10000

Section, Block and/or Survey

SECTION 7 BLOCK ABSTRACT 150

SURVEY HT&B RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
522 ft. SOUTH 1434 ft. EAST	ft.
DISTANCE TO LEASE LINES	DISTANCE TO NEAREST WELL ON LEASE
522 ft. SOUTH 1434 ft. EAST	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	454.00	10,000	4	03
BEAD FARM COMPANY			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	27 June 2024	**GAU Number:**	382934

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	
		County:	JEFFERSON
		Lease Name:	Bead Farm Company
		Lease Number:	
Operator No.:	101256	**Well Number:**	
		Total Vertical	10000
		Latitude:	30.021130
		Longitude:	-94.293605
		Datum:	NAD27

Purpose: Test Well

Location: Survey-HT&B RR CO; Abstract-150; Section-7

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

Usable-quality water occurs from the land surface to a depth of 1,100 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

This recommendation is applicable to all wells within a radius of 2,000 feet of this location.

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 06/27/2024. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

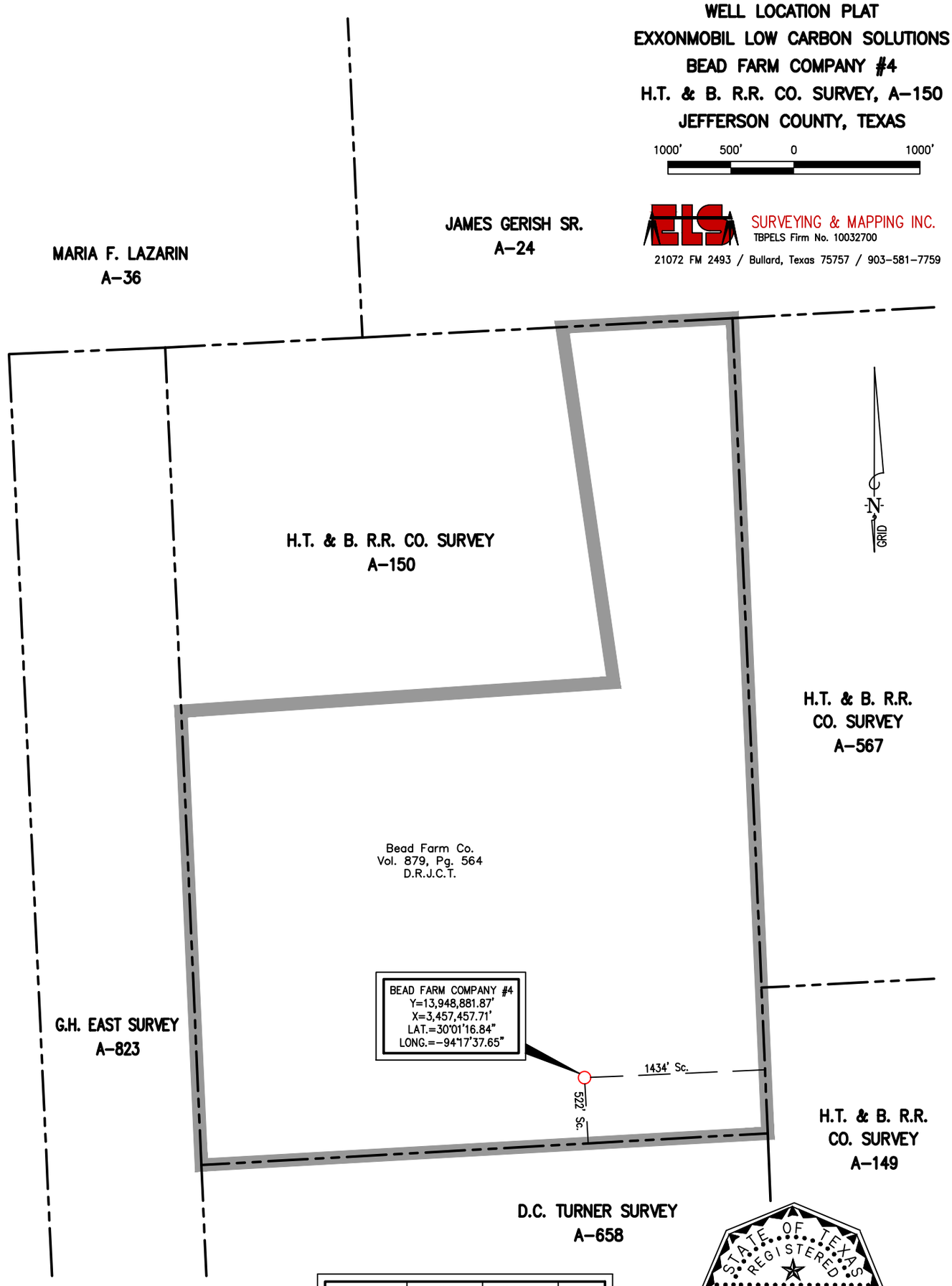
Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
BEAD FARM COMPANY #4
H.T. & B. R.R. CO. SURVEY, A-150
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

ELS SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759



SHL	TRACT CALLS	SURVEY CALLS	ELEV.
BEAD FARM COMPANY #4	522' Sc. FSL 1434' Sc. FEL	522' Sc. FSL 1434' Sc. FEL	24.0'

Location is approximately
12.3 miles SW of Beaumont, Tx.
"CHINA" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 2.8 miles turn right (North) on Green Pond Gully Road Go 1.5 miles. Turn Left (Northwest). Drive on location.

DATE SURVEYED: 5/20/2024

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data shown hereon was furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

STATE OF TEXAS REGISTERED
JIM G. GLASS
5262
PROFESSIONAL LAND SURVEYOR

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS – – – COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: May 30, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: BWT/ECJ FB 2747/36-37 Job No. 430923 Map No. J-0923-LOC-MON2

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 01/30/2025
Tracking No.: 326182

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-0000

WELL INFORMATION

API 42-245-32914 **County:** JEFFERSON
Well No.: 4 **RRC District** 03
Lease BEAD FARM COMPANY **Field** WILDCAT
RRC Lease 28194 **Field No.:** 00006001
Location Section: 7, Block: , Survey: HT&B RR CO, Abstract: 150

Latitude 30 **Longitud** -94
This well is 3 **miles in a** SE
direction from CHINA, TX,
which is the nearest town in the

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 10/07/2024

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	07/11/2024	901180
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 09/01/2024 **Date of first production after rig** 10/07/2024
Date plug back, deepening, drilling operation 09/01/2024 **Date plug back, deepening, recompletion, drilling operation** 10/07/2024
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 454.00 **Elevation** 24 GL
Total depth TVD 8383 **Total depth MD**
Plug back depth TVD 8283 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing Is Cementing Affidavit (Form W-15)** 25.8 Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:
Location of well, relative to nearest lease of lease on which this well is 522.0 **Feet from the** South **Line and** 1434.0 **Feet from the** East **Line of the** BEAD FARM COMPANY **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1100.0	**Date**	06/27/2024
SWR 13 Exception		**Depth**	2350.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
1	Surface	9 5/8	12 1/4	2184			H	548	1108.0	0	Circulated to Surface
2	Conventional Production	5 1/2	8 1/2	8367			H	1360	2573.5	0	Circulated to Surface

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
			/

N/A

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
1	No	L 2491	2501.0

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG)

Actual maximum pressure (PSIG) during hydraulic fracturing

fracturin

Has the hydraulic fracturing fluid disclosure been No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)

N/A

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	
CAPROCK - DISPOSAL	No			No	
SPINDLETOP SALT DOME - DISPOSAL	No			No	
FANNETT SALT DOME - DISPOSAL	No			No	
BIG HILL SALT DOME - DISPOSAL	No			No	
PLEISTOCENE-LISSIE - DISPOSAL	No			No	
MIOCENE - DISPOSAL	Yes	3436.0	3437.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6331.0	6332.0	Yes	LOGGED
MARINULINA - DISPOSAL	No			No	
HETEROSTEGINA - DISPOSAL	Yes	6030.0	6091.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS SHUT-IN. THIS WELL HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

CASING RECORD :

CEMENT PUMPING WAS NOT REQUIRED TO SET THE CONDUCTOR CASING, AS THE CONDUCTOR WAS SUCCESSFULLY SET WITHOUT THE USE OF MUD. THE WELL WAS COMPLETED WITHOUT PUMPING OR MUD CIRCULATION. CLASS A 4000 PSI CEMENT, COMBINED WITH 5/8-INCH PEA GRAVEL AND MANUFACTURED SAND, WAS POURED DOWN THE BACKSIDE TO SECURE THE CONDUCTOR.

TUBING RECORD:

PURPOSE OF WELL TO MONITOR PRESSURE AND FLUID TRENDS. U-TUBE SAMPLER, FIBER AND TEC LINE MOUNTED ON BACKSIDE OF CASING.

PRODUCING/INJECTION/DISPOSAL INTERVAL :

U-TUBE FLUID SAMPLER WITH CASING MOUNTED GUNS ON THE BACKSIDE OF THE CASING. FLUID SAMPLING INTERVAL IS FROM 2,491 FEET MD TO 2,501 FEET MD.

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION

Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	01/09/2025

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: ExxonMobil Low Carbon Solutions	**Operator P-5 No.:** 101256
Cementer Name: Halliburton	**Cementer P-5 No.:** 347151

WELL INFORMATION

District No.: 3	**County:** Jefferson	
Well No.: Bead Farm Company #4	**API No.:** 42-245-32914	**Drilling Permit No.:** 901180
Lease Name: Bead Farm Company #4	**Lease No.:**	
Field Name: Wildcat	**Field No.:**	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☒ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 12-1/4"	**Depth of drilled hole (ft.):** 2,199'	**Est. % wash-out or hole enlargement:** 10%
Size of casing in O.D. (in.): 9-5/8"	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☒ NO **If no for surface casing, explain in Remarks.**	**Setting depth shoe (ft.):** 2,184'	**Top of liner (ft.):** / **Setting depth liner (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:** September 2, 2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	372.02	A	See Remarks	883.74	~~484~~ 1,780
2	175.85	~~X~~ H	See Remarks	224.30	1,~~780~~ 404
3					
Total	547.87			1,108.04	2,184

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	**Depth of drilled hole (ft.):**	**Est. % wash-out or hole enlargement:**
Size of casing in O.D. (in.):	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Tapered string drilled hole size (in.) Upper: Lower:	**Tapered string depth of drilled hole (ft.)** Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	**Tapered string casing weight(lbs/ft) and grade** Upper: Lower:	**Tapered string no. of centralizers used** Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		**Setting depth shoe (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:**

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	**Depth of drilled hole (ft.):**	**Est. % wash-out or hole enlargement:**
Size of casing in O.D. (in.):	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Tapered string drilled hole size (in.) Upper: Lower:	**Tapered string depth of drilled hole (ft.)** Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	**Tapered string casing weight(lbs/ft) and grade** Upper: Lower:	**Tapered string no. of centralizers used** Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		**Setting depth tool (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:**

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

Primary surface cement job confirmed TOC @ 120' (via temp log and CBL conducted within 24 hrs). Top-off job perfomed with cement returns to surface. (DP 901180)

EXXONMOBIL LOW CARBON-EBUS, Bead Farm Company #4, Surface: SLURRY 1: ExtendaCem , SLURRY 2: HALCem

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

Name and title of cementer's representative	Cementing Company	Signature
Cole Folsom SERVICE Leader	Halliburton	

Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.
4920 Industrial Dr	Bossier City LA 71111	701-421-3299	9/2/24

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

Typed or printed name of operator's representative	Title	Signature
James Harvey	Operations Supervisor	James Harvey

Address	City,	State,	Zip Code	Tel: Area Code	Number	Date: mo. day yr.
22777 Springwoods Village Parkway	Spring	TX	77389	9189164340		9/2/2024

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.texas.gov/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Form W-15
Rev. 08/2014

CEMENTING REPORT

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: Exxon Mobil low Carbon Solutions	Operator P-5 No.:
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 03	County: Jefferson
Well No.: B 4	API No.: 42-245-32914 Drilling Permit No.: 901180
Lease Name: Bead Farm Company	Lease No.:
Field Name: Wildcat	Field No.:

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☑ Production

Drilled hole size (in.): 8 1/2	Depth of drilled hole (ft.): 8383	Est. % wash-out or hole enlargement: 10%
Size of casing in O.D. (in.): 5 1/2	Casing weight (lbs/ft) and grade: ~~23~~ 20, 13CR	No. of centralizers used: 188
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 8367	Top of liner (ft.):
		Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date: 9/8/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	505	H	SEE RAMARKS	921.62	1323
2	855	H	SEE REMARKS	1651.86	7047
3					
Total	1360			2573.48	8370

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXONMOBIL CORPORATION-EBUS,BEAD FARM CO,4,PRODUCTION:
SLURRY 1:CorossaCem , SLURRY 2:CorossaLOCK

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

ZOUHIR ROUBACHE	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	9/8/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James Harvey	Operations Supervisor		
Typed or printed name of operator's representative	Title	Signature	
22777 Springwood Village	Spring, TX 77389	512 949 8272	9/10/24
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

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D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON | Sperry Drilling

DGR / DIR

Powered by INSITE™

1 : 500

MD Detail Log

Country : USA
Field : WILDCAT
Location : Lat: 30° 1' 16.85" North Long: 94° 17' 37.65" West
Well : BEAD FARM COMPANY 4
Company : EXXONMOBIL LOW C SOL ON STOR LL
Rig : NABORS X33

Company	:	EXXONMOBIL LOW C SOL ON STOR LL
Rig	:	NABORS X33
Well	:	BEAD FARM COMPANY 4
Field	:	WILDCAT
Country	:	USA
API Number	:	4224532914

LOCATION

Latitude : 30° 1' 16.85" North
Longitude : 94° 17' 37.65" West

UTM X = 3,457,457.710 usft
UTM Y = 13,948,881.870 usft

Other Services

Permanent Datum : Ground Level
Elevation : 27.90 ft
Log Measured From : Drill Floor
32.52 ft Above Permanent Datum
Drilling Measured From : Drill Floor

MD LOG

Elev. KB
DF 60.42 ft
GL 27.90 ft
WD

Depth Logged : 152.50 ft To 8,383.00 ft
Date Logged : 01-Sep-24 To 05-Sep-24
Total Depth MD : 8,383.00 ft TVD : 8,381.10 ft
Spud Date : 01-Sep-24

Unit No. : N/A
Job No. : LF-XX-0909035812
Plot Type : Final
Plot Date : 20-Sep-24

Run No.	Borehole Record (MD)			Size	Casing Record (MD)		
	Size	From	To		Weight	From	To
100	12.250 in	152.50 ft	2,199.00 ft	20.000 in	78.60 lbpf	SURFACE	152.50 ft
200	8.500 in	2,199.00 ft	8,383.00 ft	9.625 in	40.00 lbpf	SURFACE	2,183.00 ft

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	01-Sep-24	05-Sep-24			
Rig Bit Number	100	200			
Bit Size (in)	12.250	8.500			
Tool Nominal OD (in)	8.150	6.750			
Log Start Depth (MD, ft)	152.50	2,199.00			
Log End Depth (MD, ft)	2,199.00	8,383.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	01-Sep-24 02:40	04-Sep-24 01:10			
Drill/Wipe End Date and Time	01-Sep-24 13:26	05-Sep-24 05:17			
Min Inc (deg) @ Depth (MD, ft)	0.18 @ 1,432.00	0.62 @ 2,928.00			
Max Inc (deg) @ Depth (MD, ft)	1.28 @ 1,717.00	2.38 @ 7,271.00			
Bit TFA(in2) / Bit Type	1.23 / HD65s	1.05 / HD65s			
Flow Rate (gpm)	700.00	600.00			
Max AV (fpm) / CV (fpm) @ MWD	80.0 / 46.0	171.0 / 350.0			
Fluid Type	Diesel Mud Base	Diesel Mud Base			
Density (ppg) / Viscosity (spqt)	9.30 / 32.00	10.25 / 67.00			
Filtrate CL (ppm)	1,300.00	57,000.00			
pH / API Filtrate (mptm)	8.10 / 8	N/A / 2			
PV (cP) / YP (lhf2)	4 / 4.00	22 / 29.00			
% Solids / % Sand	5.9 / 0	10.7 / 0			
% Oil / Oil:Water Ratio	0 / 0:100	56 / 65:35			
Rm @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A			
Rmf @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A			
Rmc @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A			
Max Tool Temp (degF) / Source	113.18 / HCIM	173.18 / HCIM			
Rm @ Max Tool Temp (degF)	N/A @ 113.18	N/A @ 173.18			
Lead MWD Engineer	Daniel Nalin	Daniel Nalin			
Customer Representative	N/A	N/A			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM			
Software Version	98.43	98.43			
Sub Serial Number	11432374	13172015			
Insert Serial Number	11753209	250429			
Date and Time Initialized	31-Aug-24 18:21	03-Sep-24 17:42			
Date and Time Read	01-Sep-24 19:40	05-Sep-24 18:56			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	19.63	58.07			
Software Version	6.43	6.43			
Sub Serial Number	11233637	11112526			
Sonde Serial Number	11902241	11902011			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	0.00	310.00			

Gamma Ray Sensor Information

Tool Type	DGR	DGR			
Distance From Bit (ft)	9.58	46.35			
Recorded Sample Period (sec)	4	4			
Software Version	N/A	N/A			
Sub Serial Number	11654485	12444096			
Insert/Sonde Serial Number	11671533	263646			

REMARKS

All depths are referenced to the driller's pipe tally.

DGXT - Gamma Ray formation exposure time

Default 1:500 Log Smoothing:
Interval Resolution: 0.5ft
Window Interval:(+/-) 0.6ft
Gap Fill: 3.0ft

Archive Name: BEAD_FARM_COMPANY_4_500MD_DETAIL_152_8383

Plot Width: 8.25 in

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division

ELECTRIC LOG STATUS REPORT

FORM L-1

Tracking No.: 326182

This facsimile L-1 was generated electronically from data submitted to the RRC.

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 10/07/2024
Field Name WILDCAT	Drilling Permit No. 901180	
Lease Name BEAD FARM COMPANY	Lease/ID No. 28194	Well No. 4
County JEFFERSON	API No. 42- 245-32914	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

Lease or ID No(s). _____

Well No(s). _____

Josh Calkin
Signature

Title

EXXONMOBIL LOW C SOL ON STOR LLC
Name (print)

(281) 702-5537
Phone

12/18/2024
Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Kristen Killen,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **September 1, 2024 to September 5, 2024** conduct or supervise the taking of Directional Surveys as follow:

- **306' to a depth of 8320' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8383'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **BEAD FARM COMPANY 4** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Kristen Killen, Log Analyst

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON
4607 HWY 90 EAST • BROUSSARD, LA 70518
PHONE 337 837 3061 • FAX 337 837 4400

September 20, 2024

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
BEAD FARM COMPANY 4
Permit No. 901180
Jefferson County, TX
API # 42-245-32914

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Kristen Killen, Log Analyst
Drainhole Number	-	Original
Surveyed Depths	-	306' – 8320' MWD Surveys performed by Sperry Drilling
Dates Performed	-	September 1, 2024 to September 5, 2024
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,

Kristen Killen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 909035812

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx_NAD83
Rose Prospect CCS
Bead Farm Company 4
4224532914
004 ST00BP00 Monitor

Design: 004 ST00BP00

Sperry Drilling Services

Geodetic Report

16 September, 2024

Well Coordinates: 4,251,627.70 N, 1,053,835.22 E (30° 01' 16.84" N, 094° 17' 37.65" W)
Ground Level: 27.90 ft

Local Coordinate Origin:	Centered on Well Bead Farm Company 4
Viewing Datum:	(32.52') Nabors X-33 @ 60.4ft (Spud)
TVDs to System:	N
North Reference:	Grid
Unit System:	API

Version: 5000.17 Build: 04

HALLIBURTON

Design Report for Bead Farm Company 4 - 004 ST00BP00

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Geographic Coordinates Latitude (ft)	Geographic Coordinates Longitude (ft)	UTM Coordinates Northing (m)	UTM Coordinates Easting (m)
0.0	0.00	0.00	0.0	0.0	0.0	30° 1' 16.845 N	94° 17' 37.650 W	4,251,627.70	1,053,835.22
306.0	0.32	198.12	306.0	-0.8	-0.3	30° 1' 16.837 N	94° 17' 37.654 W	4,251,627.45	1,053,835.14
414.0	0.47	222.63	414.0	-1.4	-0.7	30° 1' 16.831 N	94° 17' 37.658 W	4,251,627.26	1,053,835.02
502.0	0.50	238.67	502.0	-1.9	-1.2	30° 1' 16.827 N	94° 17' 37.665 W	4,251,627.12	1,053,834.84
610.0	0.56	223.44	610.0	-2.5	-2.0	30° 1' 16.821 N	94° 17' 37.674 W	4,251,626.93	1,053,834.61
684.0	0.73	217.70	684.0	-3.2	-2.5	30° 1' 16.815 N	94° 17' 37.681 W	4,251,626.74	1,053,834.45
774.0	0.71	220.18	774.0	-4.0	-3.2	30° 1' 16.806 N	94° 17' 37.689 W	4,251,626.47	1,053,834.23
862.0	0.57	228.82	862.0	-4.7	-3.9	30° 1' 16.800 N	94° 17' 37.697 W	4,251,626.25	1,053,834.02
956.0	0.64	221.03	956.0	-5.4	-4.6	30° 1' 16.793 N	94° 17' 37.705 W	4,251,626.04	1,053,833.81
1,053.0	0.68	235.33	1,053.0	-6.2	-5.5	30° 1' 16.786 N	94° 17' 37.715 W	4,251,625.81	1,053,833.56
1,149.0	0.43	209.78	1,149.0	-6.8	-6.1	30° 1' 16.780 N	94° 17' 37.723 W	4,251,625.62	1,053,833.36
1,243.0	0.31	224.36	1,243.0	-7.3	-6.5	30° 1' 16.775 N	94° 17' 37.727 W	4,251,625.47	1,053,833.25
1,335.0	0.37	83.65	1,335.0	-7.4	-6.3	30° 1' 16.774 N	94° 17' 37.726 W	4,251,625.43	1,053,833.29
1,432.0	0.18	65.07	1,432.0	-7.3	-5.9	30° 1' 16.775 N	94° 17' 37.720 W	4,251,625.46	1,053,833.43
1,527.0	0.25	159.60	1,527.0	-7.5	-5.7	30° 1' 16.773 N	94° 17' 37.718 W	4,251,625.42	1,053,833.49
1,620.0	0.57	127.86	1,620.0	-8.0	-5.2	30° 1' 16.768 N	94° 17' 37.713 W	4,251,625.27	1,053,833.62
1,717.0	1.28	135.35	1,716.9	-9.0	-4.1	30° 1' 16.757 N	94° 17' 37.701 W	4,251,624.95	1,053,833.97
1,815.0	1.23	141.72	1,814.9	-10.6	-2.7	30° 1' 16.741 N	94° 17' 37.686 W	4,251,624.46	1,053,834.40
1,907.0	1.11	133.32	1,906.9	-12.0	-1.4	30° 1' 16.727 N	94° 17' 37.672 W	4,251,624.04	1,053,834.79
1,998.0	0.78	120.21	1,997.9	-12.9	-0.2	30° 1' 16.717 N	94° 17' 37.659 W	4,251,623.76	1,053,835.15
2,092.0	0.75	133.29	2,091.9	-13.7	0.8	30° 1' 16.709 N	94° 17' 37.648 W	4,251,623.53	1,053,835.45
2,178.0	0.91	127.05	2,177.9	-14.5	1.7	30° 1' 16.701 N	94° 17' 37.637 W	4,251,623.29	1,053,835.74
2,264.0	0.88	125.11	2,263.9	-15.3	2.8	30° 1' 16.693 N	94° 17' 37.625 W	4,251,623.05	1,053,836.07
2,361.0	0.86	135.03	2,360.8	-16.2	3.9	30° 1' 16.683 N	94° 17' 37.613 W	4,251,622.76	1,053,836.41
2,451.0	0.96	152.98	2,450.8	-17.4	4.7	30° 1' 16.671 N	94° 17' 37.604 W	4,251,622.41	1,053,836.66
2,545.0	1.05	155.00	2,544.8	-18.8	5.5	30° 1' 16.656 N	94° 17' 37.597 W	4,251,621.96	1,053,836.88
2,642.0	0.89	152.80	2,641.8	-20.3	6.2	30° 1' 16.642 N	94° 17' 37.589 W	4,251,621.51	1,053,837.10
2,733.0	0.81	161.95	2,732.8	-21.6	6.7	30° 1' 16.629 N	94° 17' 37.584 W	4,251,621.13	1,053,837.26
2,830.0	0.75	164.25	2,829.8	-22.8	7.1	30° 1' 16.616 N	94° 17' 37.580 W	4,251,620.74	1,053,837.38
2,928.0	0.62	164.53	2,927.8	-23.9	7.4	30° 1' 16.605 N	94° 17' 37.577 W	4,251,620.40	1,053,837.48
3,019.0	0.63	154.06	3,018.8	-24.9	7.8	30° 1' 16.596 N	94° 17' 37.573 W	4,251,620.12	1,053,837.58
3,115.0	0.65	156.66	3,114.8	-25.8	8.2	30° 1' 16.586 N	94° 17' 37.569 W	4,251,619.82	1,053,837.72
3,207.0	0.75	162.03	3,206.8	-26.9	8.6	30° 1' 16.576 N	94° 17' 37.565 W	4,251,619.50	1,053,837.84
3,302.0	0.82	170.76	3,301.8	-28.2	8.9	30° 1' 16.563 N	94° 17' 37.562 W	4,251,619.12	1,053,837.93
3,396.0	0.81	168.40	3,395.7	-29.5	9.1	30° 1' 16.550 N	94° 17' 37.560 W	4,251,618.71	1,053,838.00
3,415.8	0.81	169.63	3,415.6	-29.7	9.2	30° 1' 16.547 N	94° 17' 37.559 W	4,251,618.63	1,053,838.02
3,490.0	0.83	174.11	3,489.7	-30.8	9.3	30° 1' 16.537 N	94° 17' 37.558 W	4,251,618.31	1,053,838.07
3,585.0	0.76	182.72	3,584.7	-32.1	9.4	30° 1' 16.524 N	94° 17' 37.558 W	4,251,617.91	1,053,838.08
3,679.0	0.75	176.68	3,678.7	-33.3	9.4	30° 1' 16.511 N	94° 17' 37.559 W	4,251,617.53	1,053,838.08
3,774.0	0.69	165.36	3,773.7	-34.5	9.6	30° 1' 16.500 N	94° 17' 37.557 W	4,251,617.17	1,053,838.14
3,867.0	0.63	187.14	3,866.7	-35.6	9.7	30° 1' 16.489 N	94° 17' 37.557 W	4,251,616.85	1,053,838.16
3,961.0	0.69	183.27	3,960.7	-36.7	9.6	30° 1' 16.479 N	94° 17' 37.558 W	4,251,616.53	1,053,838.13

Design Report for Bead Farm Company 4 - 004 ST00BP00

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	UTM Coordinates Northing (m)	UTM Coordinates Easting (m)
4,056.0	1.00	37.32	4,055.7	-36.6	10.0	30° 1' 16.479 N	94° 17' 37.553 W	4,251,616.55	1,053,838.27
4,150.0	1.12	45.72	4,149.7	-35.3	11.2	30° 1' 16.492 N	94° 17' 37.539 W	4,251,616.95	1,053,838.63
4,245.0	0.86	49.51	4,244.7	-34.2	12.4	30° 1' 16.502 N	94° 17' 37.525 W	4,251,617.29	1,053,838.99
4,434.0	0.63	55.87	4,433.7	-32.7	14.3	30° 1' 16.516 N	94° 17' 37.502 W	4,251,617.74	1,053,839.58
4,523.0	0.81	47.37	4,522.6	-32.0	15.2	30° 1' 16.523 N	94° 17' 37.492 W	4,251,617.96	1,053,839.85
4,600.0	0.93	49.95	4,599.6	-31.2	16.1	30° 1' 16.530 N	94° 17' 37.482 W	4,251,618.19	1,053,840.12
4,717.0	1.10	44.11	4,716.6	-29.8	17.6	30° 1' 16.544 N	94° 17' 37.464 W	4,251,618.62	1,053,840.58
4,813.0	1.20	50.22	4,812.6	-28.5	19.0	30° 1' 16.556 N	94° 17' 37.447 W	4,251,619.02	1,053,841.01
4,907.0	1.14	56.10	4,906.6	-27.3	20.5	30° 1' 16.567 N	94° 17' 37.429 W	4,251,619.37	1,053,841.47
5,002.0	1.30	54.06	5,001.6	-26.1	22.2	30° 1' 16.577 N	94° 17' 37.410 W	4,251,619.73	1,053,841.98
5,098.0	1.30	48.08	5,097.5	-24.8	23.9	30° 1' 16.590 N	94° 17' 37.390 W	4,251,620.14	1,053,842.50
5,192.0	1.27	65.27	5,191.5	-23.6	25.6	30° 1' 16.601 N	94° 17' 37.370 W	4,251,620.49	1,053,843.03
5,287.0	1.44	67.44	5,286.5	-22.7	27.7	30° 1' 16.609 N	94° 17' 37.346 W	4,251,620.77	1,053,843.65
5,380.0	1.58	61.93	5,379.5	-21.7	29.9	30° 1' 16.619 N	94° 17' 37.321 W	4,251,621.09	1,053,844.33
5,475.0	1.41	332.54	5,474.4	-20.0	30.5	30° 1' 16.635 N	94° 17' 37.313 W	4,251,621.59	1,053,844.51
5,570.0	1.54	324.88	5,569.4	-17.9	29.2	30° 1' 16.656 N	94° 17' 37.326 W	4,251,622.23	1,053,844.13
5,664.0	1.65	324.88	5,663.4	-15.8	27.7	30° 1' 16.678 N	94° 17' 37.342 W	4,251,622.88	1,053,843.67
5,758.0	1.72	324.00	5,757.3	-13.6	26.1	30° 1' 16.700 N	94° 17' 37.360 W	4,251,623.56	1,053,843.18
5,852.0	1.59	327.25	5,851.3	-11.3	24.6	30° 1' 16.723 N	94° 17' 37.376 W	4,251,624.25	1,053,842.71
5,947.0	1.76	326.45	5,946.2	-9.0	23.1	30° 1' 16.747 N	94° 17' 37.392 W	4,251,624.95	1,053,842.25
6,042.0	1.83	325.28	6,041.2	-6.5	21.4	30° 1' 16.772 N	94° 17' 37.410 W	4,251,625.70	1,053,841.74
6,136.0	1.55	320.67	6,135.2	-4.3	19.7	30° 1' 16.794 N	94° 17' 37.428 W	4,251,626.38	1,053,841.23
6,230.0	1.74	328.51	6,229.1	-2.1	18.2	30° 1' 16.817 N	94° 17' 37.445 W	4,251,627.05	1,053,840.76
6,325.0	1.67	328.65	6,324.1	0.3	16.7	30° 1' 16.841 N	94° 17' 37.460 W	4,251,627.79	1,053,840.31
6,419.0	1.61	334.63	6,418.0	2.7	15.4	30° 1' 16.865 N	94° 17' 37.474 W	4,251,628.51	1,053,839.92
6,514.0	1.72	331.62	6,513.0	5.1	14.2	30° 1' 16.890 N	94° 17' 37.487 W	4,251,629.26	1,053,839.54
6,609.0	1.67	330.10	6,608.0	7.6	12.8	30° 1' 16.915 N	94° 17' 37.501 W	4,251,630.00	1,053,839.12
6,703.0	1.84	340.46	6,701.9	10.2	11.6	30° 1' 16.941 N	94° 17' 37.514 W	4,251,630.80	1,053,838.76
6,797.0	1.98	336.67	6,795.9	13.1	10.5	30° 1' 16.970 N	94° 17' 37.525 W	4,251,631.69	1,053,838.41
6,893.0	2.28	321.94	6,891.8	16.1	8.6	30° 1' 17.001 N	94° 17' 37.545 W	4,251,632.61	1,053,837.85
6,987.0	2.20	322.22	6,985.7	19.0	6.4	30° 1' 17.031 N	94° 17' 37.569 W	4,251,633.49	1,053,837.16
7,081.0	2.13	327.85	7,079.7	21.9	4.3	30° 1' 17.060 N	94° 17' 37.591 W	4,251,634.38	1,053,836.54
7,176.0	2.19	330.29	7,174.6	25.0	2.5	30° 1' 17.091 N	94° 17' 37.610 W	4,251,635.32	1,053,835.98
7,271.0	2.38	329.87	7,269.5	28.3	0.6	30° 1' 17.124 N	94° 17' 37.630 W	4,251,636.32	1,053,835.41
7,365.0	2.32	329.24	7,363.4	31.6	-1.3	30° 1' 17.158 N	94° 17' 37.651 W	4,251,637.33	1,053,834.81
7,459.0	2.04	328.07	7,457.4	34.7	-3.2	30° 1' 17.189 N	94° 17' 37.671 W	4,251,638.26	1,053,834.24
7,554.0	1.11	302.87	7,552.3	36.6	-4.9	30° 1' 17.209 N	94° 17' 37.689 W	4,251,638.85	1,053,833.74
7,648.0	1.06	286.01	7,646.3	37.3	-6.5	30° 1' 17.217 N	94° 17' 37.707 W	4,251,639.07	1,053,833.25
7,743.0	1.05	266.73	7,741.3	37.5	-8.2	30° 1' 17.219 N	94° 17' 37.726 W	4,251,639.13	1,053,832.73
7,838.0	0.93	267.08	7,836.3	37.4	-9.8	30° 1' 17.219 N	94° 17' 37.745 W	4,251,639.11	1,053,832.23
7,933.0	1.31	273.72	7,931.3	37.5	-11.7	30° 1' 17.220 N	94° 17' 37.766 W	4,251,639.11	1,053,831.66
8,028.0	1.54	274.02	8,026.2	37.6	-14.0	30° 1' 17.223 N	94° 17' 37.792 W	4,251,639.16	1,053,830.94

Design Report for Bead Farm Company 4 - 004 ST00BP00

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	UTM Coordinates Northing (m)	UTM Coordinates Easting (m)
8,122.0	1.54	272.79	8,120.2	37.8	-16.5	30° 1' 17.225 N	94° 17' 37.821 W	4,251,639.21	1,053,830.17
8,216.0	1.42	278.74	8,214.2	38.0	-19.0	30° 1' 17.228 N	94° 17' 37.848 W	4,251,639.28	1,053,829.44
8,320.0	1.48	303.75	8,318.1	38.9	-21.3	30° 1' 17.239 N	94° 17' 37.875 W	4,251,639.57	1,053,828.71
8,383.0	1.48	303.75	8,381.1	39.9	-22.7	30° 1' 17.248 N	94° 17' 37.890 W	4,251,639.84	1,053,828.30

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
8,383.0	8,381.1	39.9	-22.7	Proj. to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	0.00	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
306.0	2,178.0	01 HAL MWD (MagVarMS) 12 1/4" Hole 306' - 2178'	3_MWD+HRGM+MS
2,264.0	8,320.0	02 HAL MWD (MagVarMS) 8 1/2" Hole 2264' - 8320'	3_MWD+HRGM+MS

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
152.5	152.5	20" Conductor Casing	20.000	20.000
2,184.0	2,183.9	9-5/8" Surface Casing	9.625	12.250
8,367.5	8,365.6	5-1/2" Production Casing	5.500	8.500

Design Report for Bead Farm Company 4 - 004 ST00BP00

Targets for 004 ST00BP00 Monitor

Shape	Target Name	TVD (ft)	Northing (m)	Easting (m)	+N/-S ft	+E/-W ft	Created	Updated
Polygon	Rose2 T. Fleming SD Rect. 400'	3,562.0	4,248,251.97	1,053,561.35	-11,075.2	-898.5	5/13/2024	7/5/2024
Polygon	Rose1 T. Fleming SD Rect. 400'	3,508.3	4,249,261.67	1,054,768.97	-7,762.6	3,063.5	5/13/2024	6/17/2024
Polygon	Rose BF4 T. Fleming SD Rect. 150'	3,416.0	4,251,627.70	1,053,835.22	0.0	0.0	7/30/2024	8/29/2024

North Reference Sheet for Rose Prospect CCS - Bead Farm Company 4 - 004 ST00BP00 Monitor

All data is in Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 60.4ft (Spud). Northing and Easting are relative to Bead Farm Company 4

Coordinate System is US State Plane 1983, Texas South Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 600,000.00m, False Northing: 4,000,000.00m, Scale Reduction: 0.99993482

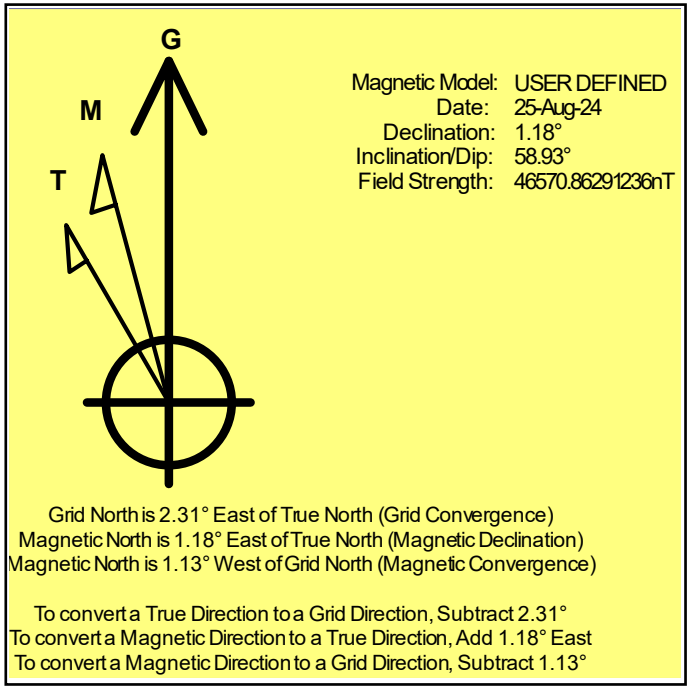
Grid Coordinates of Well: 4,251,627.70 m N, 1,053,835.22 m E

Geographical Coordinates of Well: 30° 01' 16.84" N, 094° 17' 37.65" W

Grid Convergence at Surface is: 2.31°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,383.02ft

the Bottom Hole Displacement is 45.86ft in the Direction of 330.33° (Grid).
Magnetic Convergence at surface is: 1.13° (25 August 2024, , User Defined)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
901180	Jul 11, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32914	Jul 10, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	454

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM COMPANY	4
LOCATION	**TOTAL DEPTH**
3 miles SE direction from CHINA, TX	10000

Section, Block and/or Survey

SECTION 7 BLOCK ABSTRACT 150

SURVEY HT&B RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
522 ft. SOUTH 1434 ft. EAST	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
522 ft. SOUTH 1434 ft. EAST	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	454.00	10,000	4	03
BEAD FARM COMPANY			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
BEAD FARM COMPANY #4
H.T. & B. R.R. CO. SURVEY, A-150
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

ELS SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759

MARIA F. LAZARIN
A-36

JAMES GERISH SR.
A-24

BHL: ST00
MD: 8320.00
TVD: 8318.10
From Surf Location:
17.239 N
37.890 W

H.T. & B. R.R. CO. SURVEY
A-150

GRID N

H.T. & B. R.R.
CO. SURVEY
A-567

SPERRY DRILLING JOB NO. 909035812
DATE SURVEYED September 5, 2024
SURVEYED FROM 306' TO 8320'
TIE-ON COORDINATES FROM Surface
BHL AT 8383.00 FT. (MD) = 45.86 FT.
AT 330.33° * Grid
FROM SURFACE LOCATION NW
BHL ____ = TO NW LEASE LINE

Bead Farm Co.
Vol. 879, Pg. 564
D.R.J.C.T.

BEAD FARM COMPANY #4
Y=13,948,881.87'
X=3,457,457.71'
LAT.=30°01'16.84"
LONG.=-94°17'37.65"

1434' Sc.

522' Sc.

G.H. EAST SURVEY
A-823

H.T. & B. R.R.
CO. SURVEY
A-149

D.C. TURNER SURVEY
A-658

SHL	TRACT CALLS	SURVEY CALLS	ELEV.
BEAD FARM COMPANY #4	522' Sc. FSL 1434' Sc. FEL	522' Sc. FSL 1434' Sc. FEL	24.0'

STATE OF TEXAS REGISTERED
JIM G. GLASS
5262
PROFESSIONAL LAND SURVEYOR

Location is approximately
12.3 miles SW of Beaumont, Tx.
"CHINA" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 2.8 miles turn right (North) on Green Pond Gully Road Go 1.5 miles. Turn Left (Northwest). Drive on location.

DATE SURVEYED: 5/20/2024

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data shown hereon was furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS – – – COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: May 30, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: BWT/ECJ FB 2747/36-37 Job No. 430923 Map No. J-0923-LOC-MON2

CONFIDENTIAL BUSINESS INFORMATION

CHRISTI CRADDICK, CHAIRMAN
WAYNE CHRISTIAN, COMMISSIONER
JIM WRIGHT, COMMISSIONER

DANNY SORRELLS
DIRECTOR, OIL AND GAS DIVISION
PETER FISHER, P.G.
DISTRICT DIRECTOR

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

OPERATOR Name:	EXXONMOBIL LOW C SOL ON	**RE:**	**Lease:**	BEAD FARM COMPANY
Address1:	ATTN EDWARD E GRAHAM			
Address2:	22777 SPRINGWOODS VILLAGE PKWY	**Well No:**	4	
City:	SPRING	**Sec:**	7	**Block:**
State:	TX	**County:**	JEFFERSON	
		Survey Name:	HT&B RR CO	

SWR13EX Application Number: 132309 **Drilling Permit No:** 901180

SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for **LEASE** BEAD FARM COMPANY ; **WELL** 4 has been approved by the Railroad Commission of Texas District Office.

a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.

b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.

c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.

d. The casing and cement program shall adhere to the following specifications:

Set 2350 feet of surface casing and circulate cement from the shoe to the ground surface.

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted 07/18/2024 .
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: AUDREY KUKLENZ DATE: 07/22/2024

PETER FISHER, P.G.

DISTRICT DIRECTOR

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

22777 Springwoods Parkway
Spring, Texas 77389

To whom it may concern,

This notice is to inform that the Bead Farm Company #4 well (API# 42-245-32914), located in Jefferson County, Texas, will be converted into a monitoring well. The well has been equipped with the with the following instrumentation:

- Electric line (TEC) from surface to a well depth of 7,787 feet MD with pressure and temperature sensors installed intermittently from 3,347 feet MD to 7,787 feet MD.
- Fiber optic pressure and temperature gauge sensor at 2,475 feet MD.
- U-tube fluid sampler with casing mounted guns. The perforation interval for fluid sampling is from 2,491 feet MD to 2,501 feet MD.
- Fiber optic cable from the surface to a well depth of 8,234 feet MD.

All the above equipment was installed on the exterior of the production casing and cemented in place. There are no perforations through the casing.

Regards,

DocuSigned by:
Jonathan Rodriguez
D38AA01693BB4EE...

Jonathan Rodriguez
Completion Advisor
ExxonMobil

CONFIDENTIAL BUSINESS INFORMATION

docusign

Certificate Of Completion

Envelope Id: 28E2F290-FB72-40D0-AA8F-30274455EBC0
Status: Completed
Subject: Complete with Docusign: W2 Monitor Well Statement V2.pdf
Source Envelope:
Document Pages: 1
Signatures: 1
Envelope Originator:
Certificate Pages: 2
Initials: 0
WILLIAM Carr
AutoNav: Enabled
Address Redacted
EnvelopeId Stamping: Disabled
william.j.carr@exxonmobil.com
Time Zone: (UTC-06:00) Central Time (US & Canada)
IP Address: 136.228.238.182

Record Tracking

Status: Original
12/23/2024 2:53:49 PM
Holder: WILLIAM Carr
william.j.carr@exxonmobil.com
Location: DocuSign
Security Appliance Status: Connected
Pool: Main SecApp 1

Signer Events	Signature	Timestamp
Jonathan Rodriguez jonathan.a.rodriguez@exxonmobil.com ExxonMobil General Security Level: Email, Account Authentication (None)	DocuSigned by: Jonathan Rodriguez D38AA01693BB4EE... Signature Adoption: Pre-selected Style Using IP Address: 136.228.238.73	Sent: 12/23/2024 2:54:34 PM Viewed: 12/23/2024 2:55:37 PM Signed: 12/23/2024 2:55:47 PM

Electronic Record and Signature Disclosure:
Accepted: 7/12/2022 6:18:31 AM
ID: 24c3aed4-aea4-42d2-a30a-2d53609eb06c
Company Name: Exxon Mobil Corporation

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	12/23/2024 2:54:34 PM
Certified Delivered	Security Checked	12/23/2024 2:55:37 PM
Signing Complete	Security Checked	12/23/2024 2:55:47 PM
Completed	Security Checked	12/23/2024 2:55:47 PM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

Electronic Record and Signature Disclosure created on: 2/24/2022 12:08:30 AM
Parties agreed to: Jonathan Rodriguez

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- I am authorized to do the specific type of work (approve, endorse, etc.) in the country where I am physically located when using DocuSign

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CONFIDENTIAL BUSINESS INFORMATION

678487 (USDW Monitoring Well No. 1)

CONFIDENTIAL BUSINESS INFORMATION

STATE OF TEXAS WELL REPORT for Tracking #678487

Owner: **ExxonMobil Low Carbon Solutions Onshore Storage LLC**

Address: **22777 Springwoods Village Parkway Spring, TX 77389**

Well Location: **Theriot Rd China, TX**

~1.5 miles south East of China. Well is located on south side of road in agriculture field

Well County: **Jefferson**

Owner Well #: **Bead USDW MW 1**

Grid #: **61-62-8**

Latitude: **30° 01' 51" N**

Longitude: **094° 18' 38" W**

Elevation: **No Data**

Type of Work: **New Well**

Proposed Use: **Monitor**

Drilling Start Date: **6/27/2024** Drilling End Date: **8/20/2024**

Borehole:

Diameter (in.)	Top Depth (ft.)	Bottom Depth (ft.)
8	0	330

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	Bottom Depth (ft.)	Filter Material	Size
295	330	Sand	20/40

Annular Seal Data:

Top Depth (ft.)	Bottom Depth (ft.)	Description (number of sacks & material)
0	290	Cement 68 Bags/Sacks
290	295	Bentonite 2 Bags/Sacks

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Walker-Hill Environmental, Inc.**

PO 1147
Foxworth, MS 39483

Driller Name: **Gary P Hill** License Number: **58141**

Apprentice Name: **Eric Meitzler**

Comments: **No Data**

Report Amended on 12/5/2024 by Request #43900

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**20**	**Clay, sand, trace gravel**
20	**60**	**Clay**
60	**120**	**Sandy Clay**
120	**180**	**Clay with sand**
180	**280**	**Clay**
280	**300**	**Clay, sand**
300	**330**	**Sand**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4	**Riser**	**New Plastic (PVC)**	**40**	**-3**	**300**
4	**Screen**	**New Plastic (PVC)**	**40 0.010**	**300**	**320**
4	**Riser**	**New Plastic (PVC)**	**40**	**320**	**330**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

CONFIDENTIAL BUSINESS INFORMATION

683826 USDW Monitoring Well No. 2

STATE OF TEXAS WELL REPORT for Tracking #683826

Owner:	**ExxonMobil Low Carbon Solutions Onshore Storage LLC**	Owner Well #:	**LaBelle USDW MW 2R**
Address:	**22777 Springwoods Village Parkway Spring, TX 77389**	Grid #:	**61-62-9**
		Latitude:	**30° 00' 09" N**
Well Location:	**Theriot Rd China, TX**	Longitude:	**094° 16' 28" W**
		Elevation:	**No Data**
Well County:	**Jefferson**		

Type of Work: **New Well** Proposed Use: **Monitor**

Drilling Start Date: **11/5/2024** Drilling End Date: **11/9/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8	**0**	**320**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
285	**320**	**Sand**	**20/40**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**279**	**Cement 45 Bags/Sacks**
279	**285**	**Bentonite 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Walker-Hill Environmental, Inc.**

PO 1147
Foxworth, MS 39483

Driller Name: **Gary P Hill** License Number: **58141**

Apprentice Name: **Eric Meitzler**

Comments: **This well replaced damaged well USDW-2 that was plugged**

Report Amended on 12/5/2024 by Request #43897

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**20**	**Clay, sand, trace gravel**
20	**60**	**Clay**
60	**120**	**Sandy Clay**
120	**180**	**Clay with sand**
180	**270**	**Clay**
270	**320**	**Clay, sand**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4	**Riser**	**New Plastic (PVC)**	**80**	**-3**	**290**
4	**Screen**	**New Plastic (PVC)**	**80 0.010**	**290**	**310**
4	**Riser**	**New Plastic (PVC)**	**80**	**310**	**320**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

CONFIDENTIAL BUSINESS INFORMATION

678491 USDW Monitoring Well No. 3

CONFIDENTIAL BUSINESS INFORMATION

STATE OF TEXAS WELL REPORT for Tracking #678491

Owner:	**ExxonMobil Low Carbon Solutions Onshore Storage LLC**	Owner Well #:	**Bead USDW MW 3**
Address:	**22777 Springwoods Village Parkway Spring, TX 77389**	Grid #:	**64-06-2**
Well Location:	**Lawhorn Rd China, TX**	Latitude:	**29° 59' 15" N**
Well County:	**Jefferson**	Longitude:	**094° 17' 56" W**
		Elevation:	**No Data**

Type of Work: **New Well** Proposed Use: **Monitor**

Drilling Start Date: **6/25/2024** Drilling End Date: **8/20/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8	**0**	**330**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
298	**330**	**Sand**	**20/40**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**295**	**Cement 65 Bags/Sacks**
295	**298**	**Bentonite 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Walker-Hill Environmental, Inc.**

PO 1147
Foxworth, MS 39483

Driller Name: **Gary P Hill** License Number: **58141**

Apprentice Name: **Eric Meitzler**

Comments: **No Data**

Report Amended on 12/5/2024 by Request #43898

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**20**	**Clay, sand, trace gravel**
20	**60**	**Clay**
60	**120**	**Sandy Clay**
120	**180**	**Clay with sand**
180	**280**	**Clay**
280	**300**	**Clay, sand**
300	**330**	**Sand**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4	**Riser**	**New Plastic (PVC)**	**40**	**-3**	**300**
4	**Screen**	**New Plastic (PVC)**	**40 0.010**	**300**	**320**
4	**Riser**	**New Plastic (PVC)**	**40**	**320**	**330**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

CONFIDENTIAL BUSINESS INFORMATION

678489

STATE OF TEXAS WELL REPORT for Tracking #678489

Owner: **ExxonMobil Low Carbon Solutions Onshore Storage LLC**

Address: **22777 Springwoods Village Parkway Spring, TX 77389**

Well Location: **Theriot Rd China, TX**

Well County: **Jefferson**

Owner Well #: **LaBelle USDW MW 2**

Grid #: **61-62-9**

Latitude: **30° 00' 09" N**

Longitude: **094° 16' 28" W**

Elevation: **No Data**

****This well has been plugged**** **Plugging Report Tracking #241952**

Type of Work: **New Well**

Proposed Use: **Monitor**

Drilling Start Date: **6/21/2024** Drilling End Date: **8/20/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
8	**0**	**440**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
314	**350**	**Sand**	**20/40**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**310**	**Cement 72 Bags/Sacks**
310	**314**	**Bentonite 2 Bags/Sacks**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Surface Slab Installed** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	Top Depth (ft.)	Bottom Depth (ft.)
Cement	**350**	**440**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Walker-Hill Environmental, Inc.**

PO 1147
Foxworth, MS 39483

Driller Name: **Gary P Hill** License Number: **58141**

Apprentice Name: **Eric Meitzler**

Comments: **No Data**

Report Amended on 12/5/2024 by Request #43899

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**20**	**Clay, sand, trace gravel**
20	**60**	**Clay**
60	**120**	**Sandy Clay**
120	**180**	**Clay with sand**
180	**280**	**Clay**
280	**300**	**Clay, sand**
300	**330**	**Sand**
330	**440**	**Clay**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4	**Riser**	**New Plastic (PVC)**	**40**	**-3**	**320**
4	**Screen**	**New Plastic (PVC)**	**40 0.010**	**320**	**340**
4	**Riser**	**New Plastic (PVC)**	**40**	**340**	**350**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Austin, TX 78711
(512) 334-5540

CONFIDENTIAL BUSINESS INFORMATION

STATE OF TEXAS PLUGGING REPORT for Tracking #241952

Owner: **ExxonMobil Low Carbon Solutions Onshore Storage LLC**

Address: **22777 Springwoods Village Parkway Spring, TX 77389**

Well Location: **Theriot Rd China, TX**

Well County: **Jefferson**

Owner Well #: **LaBelle USDW MW 2**

Grid #: **61-62-9**

Latitude: **30° 00' 09" N**

Longitude: **094° 16' 28" W**

Elevation: **No Data**

Well Type: **Monitor**

Drilling Information

Company: **Walker-Hill Environmental, Inc.**

Date Drilled: **8/20/2024**

Driller: **Gary P Hill**

License Number: **58141**

Well Report Tracking #678489

	Diameter (in.)	Top Depth (ft.)	Bottom Depth (ft.)
Borehole:	8	0	440

Plugging Information

Date Plugged: **11/5/2024**

Plugger:

Plug Method: **Tremmie pipe cement from bottom to top**

Casing Left in Well:

Dia (in.)	Top (ft.)	Bottom (ft.)
4	0	350

Plug(s) Placed in Well:

Top (ft.)	Bottom (ft.)	Description (number of sacks & material)
0	350	Cement 21 Bags/Sacks

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information: **Walker-Hill Environmental, Inc.**

PO 1147
Foxworth, MS 39483

Driller Name: **Gary P Hill**

License Number: **58141**

Apprentice Name: **Eric Meitzler**

Comments: **No Data**

Report Amended on 12/5/2024 by Request #21385

CONFIDENTIAL BUSINESS INFORMATION

645970 (Bead Farm Co. #1 Water Rig Supply Well)

STATE OF TEXAS WELL REPORT for Tracking #645970

Owner:	**Exxon Mobil**	Owner Well #:	**Bead Farm #1**
Address:	**22777 Springwoods Village Pkwy Spring, TX 77389**	Grid #:	**64-06-2**
Well Location:	**From the intersection of Pignut Rd and Green Pond Gully Rd, travel east on Pignut Rd and turn south on lease rd. Follow lease rd to location Beaumont, TX 77713**	Latitude:	**29° 59' 56.5" N**
		Longitude:	**094° 17' 53" W**
		Elevation:	**24 ft. above sea level**
Well County:	**Jefferson**		
Type of Work:	**New Well**	Proposed Use:	**Rig Supply**

Drilling Start Date: **8/10/2023** Drilling End Date: **8/11/2023**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
7.875	**0**	**290**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
250	**290**	**Gravel**	**16/30**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**15**	**Cement 4 Bags/Sacks**

Seal Method: **Pumped**

Sealed By: **Driller**

Distance to Property Line (ft.): **> 100ft**

Distance to Septic Field or other concentrated contamination (ft.): **>150 ft**

Distance to Septic Tank (ft.): **> 150ft**

Method of Verification: **wheel/gis**

Surface Completion: **Surface Sleeve Installed** **Surface Completion by Driller**

Water Level: **70 ft.** below land surface on **2023-08-11** Measurement Method: **Electric Line**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **HYDROLINE DRILLING LLC**

706 GLADNEY ST
MINDEN, LA 71055

Driller Name: **Spencer White**

License Number: **60321**

Apprentice Name: **Derrick Wyatt**

Apprentice Number: **61365**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**20**	**clay**
20	**40**	**sand**
40	**60**	**stripping**
60	**120**	**shale**
120	**140**	**stripping**
140	**180**	**sand**
180	**200**	**shale**
200	**240**	**stripping**
240	**290**	**sand**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4	**Blank**	**New Plastic (PVC)**	**40**	**0**	**270**
4	**Screen**	**New Stainless Steel**	**40 0.018**	**270**	**290**

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Austin, TX 78711
(512) 334-5540

CONFIDENTIAL BUSINESS INFORMATION

616901 D. S. Wier

CONFIDENTIAL BUSINESS INFORMATION

Texas Water Development Board (TWDB) Groundwater Database (GWDB) Well Information Report for State Well Number 61-62-901

GWDB Reports and Downloads

Well Basic Details

Scanned Documents

State Well Number	6162901
County	Jefferson
River Basin	Neches-Trinity
Groundwater Management Area	14
Regional Water Planning Area	I - East Texas
Groundwater Conservation District	GCD Does Not Exist
Latitude (decimal degrees)	30.001389
Latitude (degrees minutes seconds)	30° 00' 05" N
Longitude (decimal degrees)	-94.270833
Longitude (degrees minutes seconds)	094° 16' 15" W
Coordinate Source	+/- 5 Seconds
Aquifer Code	112CHCTU - Chicot Aquifer, Upper
Aquifer	Gulf Coast
Aquifer Pick Method	
Land Surface Elevation (feet above sea level)	25
Land Surface Elevation Method	Interpolated From Topo Map
Well Depth (feet below land surface)	7
Well Depth Source	Another Government Agency
Drilling Start Date	
Drilling End Date	
Drilling Method	Dug
Borehole Completion	

Well Type	Withdrawal of Water
Well Use	Plugged or Destroyed
Water Level Observation	Miscellaneous Measurements
Water Quality Available	Yes
Pump	None
Pump Depth (feet below land surface)	
Power Type	
Annular Seal Method	
Surface Completion	
Owner	D. S. Wier
Driller	
Other Data Available	
Well Report Tracking Number	
Plugging Report Tracking Number	
U.S. Geological Survey Site Number	
Texas Commission on Environmental Quality Source Id	
Groundwater Conservation District Well Number	
Owner Well Number	
Other Well Number	
Previous State Well Number	
Reporting Agency	U.S. Geological Survey
Created Date	
Last Update Date	3/4/2020

Remarks	Dug well. Wood casing. Destroyed.

Casing - No Data

Well Tests - No Data

Lithology - No Data

Annular Seal Range - No Data

Borehole - No Data

Plugged Back - No Data

Filter Pack - No Data

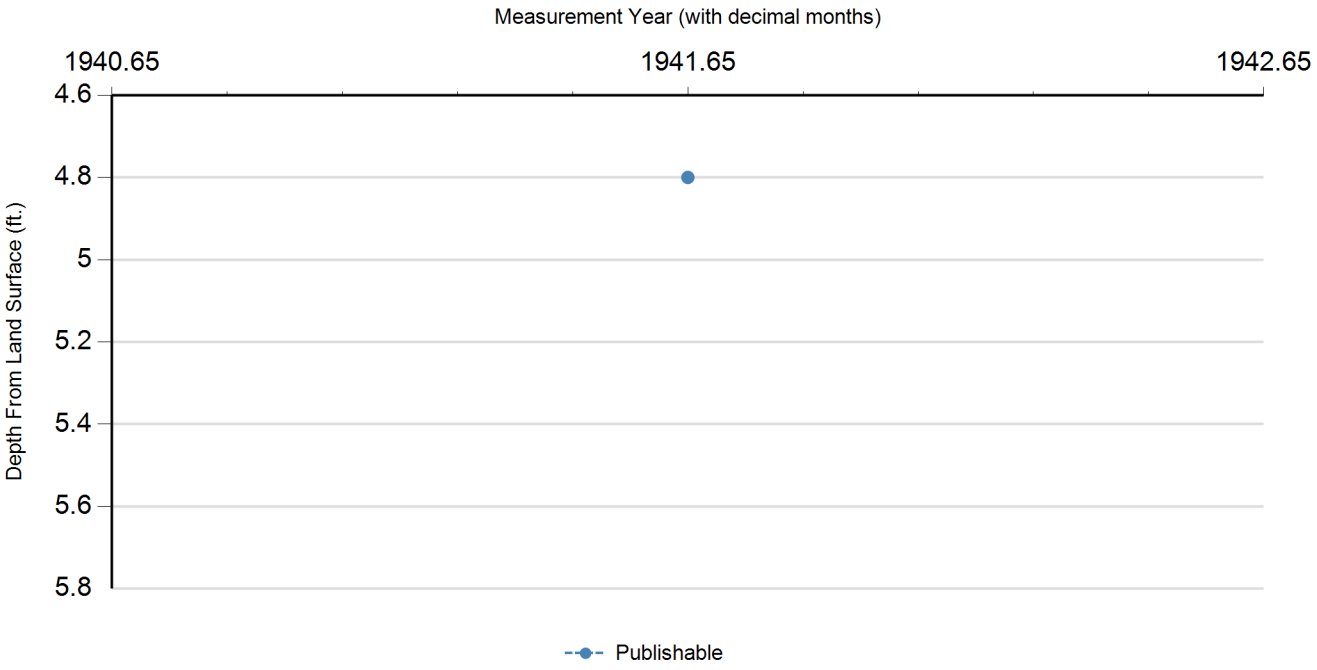
Packers - No Data

Texas Water Development Board

Texas Water Development Board (TWDB) Groundwater Database (GWDB) Well Information Report for State Well Number 61-62-901

groundwater division

Water Level Measurements



Status Code	Date	Time	Water Level (ft. below land surface)	Change value in ( ) indicates rise in level	Water Elevation (ft. above sea level)	Meas #	Measuring Agency	Method	Remark ID	Comments
P	8/27/1941		4.8		20.2	1	Other or Source of Measurement Unknown	Unknown		

Code Descriptions

Status Code	Status Description
P	Publishable

Texas Water Development Board (TWDB) Groundwater Database (GWDB) Well Information Report for State Well Number 61-62-901

Water Quality Analysis

Sample Date: 8/27/1941 **Sample Time:** 0000 **Sample Number:** 1 **Collection Entity:** Texas Department of Health

Sampled Aquifer: Chicot Aquifer, Upper

Analyzed Lab: University of Texas **Reliability:** Reliability unknown or not available

Collection Remarks: Analytical results from M-146

Parameter Code	Parameter Description	Flag	Value*	Units	Plus/Minus
00415	ALKALINITY, PHENOLPHTHALEIN (MG/L)		0	mg/L	
00410	ALKALINITY, TOTAL (MG/L AS CACO3)		125.41	mg/L as CACO3	
00440	BICARBONATE ION, CALCULATED (MG/L AS HCO3)		153.04	mg/L	
00910	CALCIUM (MG/L)		97	mg/L	
00445	CARBONATE ION, CALCULATED (MG/L AS CO3)		0	mg/L	
00940	CHLORIDE, TOTAL (MG/L AS CL)		94	mg/L	
00900	HARDNESS, TOTAL, CALCULATED (MG/L AS CACO3)		262	mg/L as CACO3	
00920	MAGNESIUM (MG/L)		5.1	mg/L	
71851	NITRATE NITROGEN, DISSOLVED, CALCULATED (MG/L AS NO3)		45	mg/L as NO3	
71860	RESIDUAL SODIUM CARBONATE, CALCULATED		0		
00931	SODIUM ADSORPTION RATIO, CALCULATED (SAR)		0.67		
00932	SODIUM, CALCULATED, PERCENT		17	PCT	
00929	SODIUM, TOTAL (MG/L AS NA)	calculated	25	mg/L	
00945	SULFATE, TOTAL (MG/L AS SO4)		23	mg/L as SO4	
70301	TOTAL DISSOLVED SOLIDS , SUM OF CONSTITUENTS (MG/L)		364	mg/L	

** Value may not display all significant digits for parameter in results, check Scanned Documents for laboratory paperwork..*

GWDB DISCLAIMER: Except where noted, all of the information provided in the Texas Water Development Board (TWDB) Groundwater Database (https://www.twdb.texas.gov/groundwater/data/gwdbrpt.asp) is believed to be accurate and reliable; however, the TWDB assumes no responsibility for any errors appearing in rules or otherwise. Further, TWDB assumes no responsibility for the use of the information provided. PLEASE NOTE that users of these data are responsible for checking the accuracy, completeness, currency and/or suitability of all information themselves. TWDB makes no guarantees or warranties as to the accuracy, completeness, currency, or suitability of the information provided via the Groundwater Database (GWDB). TWDB specifically disclaims any and all liability for any claims or damages that may result from providing GWDB data or the information it contains. For additional information or answers to questions concerning the TWDB GWDB, contact the Groundwater Data Team at GroundwaterData@twdb.texas.gov.

670175 (Rose Injector #1 Water Rig Supply Well)

CONFIDENTIAL BUSINESS INFORMATION

STATE OF TEXAS WELL REPORT for Tracking #670175

Owner: **ExxonMobil**

Address: **22777 Springwoods Village Pkwy**
Spring, TX 77389

Well Location: **Lawhon Rd**
China, TX 77613

FROM THE INTER HYW 90 AND GREEN POND GUILLY RD GO S ON GREEN POND GULLY RD FOR 3.75 MI THEN TURN E ON LAWHON RD THEN GO 1.0MI TO LOCATION ENTRANCE THEN GO S TO THE WELL AT GPS 29.999857, -94.283210

Well County: **Jefferson**

Owner Well #: **Rose Injector #1**

Grid #: **64-06-3**

Latitude: **29° 59' 59.49" N**

Longitude: **094° 16' 59.56" W**

Elevation: **24 ft. above sea level**

Type of Work: **New Well**

Proposed Use: **Rig Supply**

Drilling Start Date: **6/14/2024** Drilling End Date: **6/14/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
7.875	**0**	**300**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
220	**300**	**Gravel**	**1**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**12**	**Cement 5 Bags/Sacks**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **>150**

Distance to Septic Field or other concentrated contamination (ft.): **>150**

Distance to Septic Tank (ft.): **>150**

Method of Verification: **Measuring Wheel**

Surface Completion: **Surface Sleeve Installed**

Surface Completion by Driller

Water Level: **80 ft.** below land surface on **2024-06-14** Measurement Method: **Electric Line**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **HYDROLINE DRILLING LLC**

706 GLADNEY ST
MINDEN, LA 71055

Driller Name: **Spencer White** License Number: **60321**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**130**	**Shale**
130	**160**	**Sand**
160	**200**	**Shale**
200	**220**	**Stripping**
220	**300**	**Sand**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4	**Blank**	**New Plastic (PVC)**	**40**	**0**	**220**
4	**Screen**	**New Plastic (PVC)**	**40 0.032**	**220**	**300**

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670177 (Rose Injector #2 Water Rig Supply Well)

STATE OF TEXAS WELL REPORT for Tracking #670177

Owner:	**ExxonMobil**	Owner Well #:	**Rose Injector #2**
Address:	**22777 Springwoods Village Pkwy Spring, TX 77389**	Grid #:	**64-06-2**
Well Location:	**Lawhon Rd China, TX 77613**	Latitude:	**29° 59' 26.58" N**
		Longitude:	**094° 17' 55.08" W**
	FROM THE INTER OF HWY 90 AND GREEN POND GULLY RD TRAVEL S ON GREEN POND GULLY RD FOR 3.75 MI TO LAWHON RD - THEN TRAVEL E 400 FT ON LAWHON RD TO A LEASE RD ON THE S SIDE OF THE RD - THEN TRAVEL 0.63 MI S ON LEASE RD TO LOCATION	Elevation:	**24 ft. above sea level**
Well County:	**Jefferson**		

Type of Work: **New Well** Proposed Use: **Rig Supply**

Drilling Start Date: **7/2/2024** Drilling End Date: **7/2/2024**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**300**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**240**	**300**	**Gravel**	**1**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**12**	**Cement 5 Bags/Sacks**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **>150**

Distance to Septic Field or other concentrated contamination (ft.): **>150**

Distance to Septic Tank (ft.): **>150**

Method of Verification: **Measuring Wheel**

Surface Completion: **Surface Sleeve Installed** **Surface Completion by Driller**

Water Level: **80 ft.** below land surface on **2024-07-02** Measurement Method: **Electric Line**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **HYDROLINE DRILLING LLC**

706 GLADNEY ST
MINDEN, LA 71055

Driller Name: **Spencer White** License Number: **60321**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**240**	**Shale**
240	**300**	**Sand**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4	**Blank**	**New Plastic (PVC)**	**40**	**0**	**240**
4	**Screen**	**New Plastic (PVC)**	**40 0.032**	**240**	**300**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

674757 (Rose Injector #3 Water Rig Supply Well)

STATE OF TEXAS WELL REPORT for Tracking #674757

Owner:	**ExxonMobil**	Owner Well #:	**3**
Address:	**22777 Springwoods Village Pkwy Spring, TX 77389**	Grid #:	**61-62-8**
Well Location:	**Green Pond Gully Rd China, TX 77613**	Latitude:	**30° 00' 44.74" N**
		Longitude:	**094° 17' 52.47" W**
	From the intersection of Hwy 90 and Green Pond Gully Rd, travel south on Green Pond Gully Rd for 2.94 miles and turn west for 0.11 miles to well site.	Elevation:	**25 ft. above sea level**
Well County:	**Jefferson**		

Type of Work: **New Well** Proposed Use: **Rig Supply**

Drilling Start Date: **7/18/2024** Drilling End Date: **7/19/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
7.875	**0**	**300**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
220	**300**	**Gravel**	**#1**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**50**	**Cement 8 Bags/Sacks**

Seal Method: **Pumped**

Sealed By: **Driller**

Distance to Property Line (ft.): **> 150ft**

Distance to Septic Field or other concentrated contamination (ft.): **>200ft**

Distance to Septic Tank (ft.): **> 200ft**

Method of Verification: **Wheel/GIS**

Surface Completion: **Surface Sleeve Installed** **Surface Completion by Driller**

Water Level: **88 ft.** below land surface on **2024-07-19** Measurement Method: **Electric Line**

Packers: **No Data**

Type of Pump: **Submersible** Pump Depth (ft.): **180**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **HYDROLINE DRILLING LLC**

706 GLADNEY ST
MINDEN, LA 71055

Driller Name: **Spencer Wade White** License Number: **60321**

Apprentice Name: **Derrick Wyatt** Apprentice Number: **61365**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**20**	**shale**
20	**100**	**Brown Sand**
100	**220**	**Brown shale**
220	**240**	**Brown shale/Powder Sand**
240	**300**	**Sand**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4	**Blank**	**New Plastic (PVC)**	**40**	**0**	**220**
4	**Screen**	**New Plastic (PVC)**	**40 0.032**	**220**	**300**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 334-5540

675893 (Bead Farm Company 4 Water Rig Supply Well)

CONFIDENTIAL BUSINESS INFORMATION

STATE OF TEXAS WELL REPORT for Tracking #675893

Owner:	**ExxonMobil**	Owner Well #:	**Bead Farm #4**
Address:	**22777 Springwoods Village Pkwy Spring, TX 77613**	Grid #:	**61-62-8**
Well Location:	**From the intersection of HWY 90 and Green Pond Gully Rd, travel south on Green Pond Gully Rd for 2.18 miles to location entrance on west side of road. Follow location entrance 0.1 miles to location Beaumont, TX 77713**	Latitude:	**30° 01' 19.01" N**
		Longitude:	**094° 17' 39.12" W**
		Elevation:	**26 ft. above sea level**
Well County:	**Jefferson**		

Type of Work: **New Well** Proposed Use: **Rig Supply**

Drilling Start Date: **8/15/2024** Drilling End Date: **8/15/2024**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**7.875**	**0**	**300**

Drilling Method: **Mud (Hydraulic) Rotary**

Borehole Completion: **Filter Packed**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
Filter Pack Intervals:	**220**	**300**	**Gravel**	**#1**

	Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
Annular Seal Data:	**0**	**50**	**Cement 10 Bags/Sacks**

Seal Method: **Gravity**

Sealed By: **Driller**

Distance to Property Line (ft.): **> 100ft**

Distance to Septic Field or other concentrated contamination (ft.): **> 150 ft**

Distance to Septic Tank (ft.): **> 150 ft**

Method of Verification: **gis/wheel**

Surface Completion: **Surface Sleeve Installed** **Surface Completion by Driller**

Water Level: **88 ft.** below land surface on **2024-08-15** Measurement Method: **Electric Line**

Packers: **No Data**

Type of Pump: **Submersible** Pump Depth (ft.): **200**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **HYDROLINE DRILLING LLC**

706 GLADNEY ST
MINDEN, LA 71055

Driller Name: **Spencer Wade White** License Number: **60321**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**115**	**shale**
115	**120**	**Rock**
120	**200**	**shale**
200	**220**	**stripping**
220	**300**	**sand**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
4	**Blank**	**New Plastic (PVC)**	**40**	**0**	**220**
4	**Screen**	**New Plastic (PVC)**	**40 0.032**	**220**	**300**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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CONFIDENTIAL BUSINESS INFORMATION

689934

CONFIDENTIAL BUSINESS INFORMATION

STATE OF TEXAS WELL REPORT for Tracking #689934

Owner:	**ExxonMobil LCS Onshore Storage LLC**	Owner Well #:	**MW1**
Address:	**22777 Springwoods Village Pkwy Spring, TX 77389**	Grid #:	**64-06-3**
Well Location:	**Lawhon Rd China, TX 77613**	Latitude:	**29° 59' 57.37" N**
Well County:	**Jefferson**	Longitude:	**094° 17' 08.34" W**
		Elevation:	**No Data**

Type of Work: **New Well** Proposed Use: **Monitor**

Drilling Start Date: **9/19/2024** Drilling End Date: **9/19/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
6	**0**	**25**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
3	**25**	**Sand**	**20/40**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**1**	**Concrete 0.5 Bags/Sacks**
1	**3**	**Bentonite 1 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Stick-Up completion** **Surface Completion by Driller**

Water Level: **15 ft.** below land surface on **2024-09-19** Measurement Method: **Observed in soil sample**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **BEST DRILLING SERVICES, INC.**

P.O. BOX 70822
Houston, TX 77270

Driller Name: **Ali Firouzbakht** License Number: **4997**

Apprentice Name: **Calistro Campozano** Apprentice Number: **56591**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1**	**GRAVEL Pad**
1	**15**	**CLAY**
15	**19**	**Clayey SILT**
19	**25**	**Silty SAND**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**-3**	**4**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**4**	**24**

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CONFIDENTIAL BUSINESS INFORMATION

689935

CONFIDENTIAL BUSINESS INFORMATION

STATE OF TEXAS WELL REPORT for Tracking #689935

Owner:	**ExxonMobil LCS Onshore Storage LLC**	Owner Well #:	**MW2**
Address:	**22777 Springwoods Village Pkwy Sping, TX 77389**	Grid #:	**64-06-2**
Well Location:	**3rd Ave China, TX 77613**	Latitude:	**29° 59' 26.23" N**
Well County:	**Jefferson**	Longitude:	**094° 17' 54.96" W**
		Elevation:	**No Data**

Type of Work: **New Well** Proposed Use: **Monitor**

Drilling Start Date: **9/17/2024** Drilling End Date: **9/17/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
6	**0**	**25**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
3	**25**	**Sand**	**20/40**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**1**	**Concrete 0.5 Bags/Sacks**
1	**3**	**Bentonite 1 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Stick-Up completion** **Surface Completion by Driller**

Water Level: **15 ft.** below land surface on **2024-09-17** Measurement Method: **Observed in soil sample**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **BEST DRILLING SERVICES, INC.**

P.O. BOX 70822
Houston, TX 77270

Driller Name: **Ali Firouzbakht** License Number: **4997**

Apprentice Name: **Calistro Campozano** Apprentice Number: **56591**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1.5**	**GRAVEL Pad**
1.5	**14**	**CLAY**
14	**20**	**Silty CLAY**
20	**25**	**Sandy CLAY**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**-3**	**4**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**4**	**24**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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(512) 334-5540

689936

CONFIDENTIAL BUSINESS INFORMATION

STATE OF TEXAS WELL REPORT for Tracking #689936

Owner:	**ExxonMobil LCS Onshore Storage LLC**	Owner Well #:	**MW3**
Address:	**22777 Springwoods Village Pkwy Spring, TX 77389**	Grid #:	**61-62-8**
		Latitude:	**30° 00' 44.57" N**
Well Location:	**Green Pond Gully Rd China, TX 77613**	Longitude:	**094° 17' 52.69" W**
		Elevation:	**No Data**
Well County:	**Jefferson**		

Type of Work: **New Well** Proposed Use: **Monitor**

Drilling Start Date: **9/17/2024** Drilling End Date: **9/17/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
6	**0**	**25**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
3	**25**	**Sand**	**20/40**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**1**	**Concrete 0.5 Bags/Sacks**
1	**3**	**Bentonite 1 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Stick-Up completion** **Surface Completion by Driller**

Water Level: **15 ft.** below land surface on **2024-09-17** Measurement Method: **Observed in soil sample**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **BEST DRILLING SERVICES, INC.**

P.O. BOX 70822
Houston, TX 77270

Driller Name: **Ali Firouzbakht** License Number: **4997**

Apprentice Name: **Calistro Campozano** Apprentice Number: **56591**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1.5**	**GRAVEL Pad**
1.5	**15**	**CLAY**
15	**25**	**Silty SAND**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**-40**	**-3**	**4**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**4**	**24**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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P.O. Box 12157
Austin, TX 78711
(512) 334-5540

689937

STATE OF TEXAS WELL REPORT for Tracking #689937

Owner:	**ExxonMobil LCS Onshore Storage LLC**	Owner Well #:	**MW4**
Address:	**22777 Springwoods Village Pkwy Spring, TX 77389**	Grid #:	**61-62-9**
Well Location:	**Lawhon Rd China, TX 77613**	Latitude:	**30° 00' 09.65" N**
Well County:	**Jefferson**	Longitude:	**094° 16' 26.51" W**
		Elevation:	**No Data**

Type of Work: **New Well** Proposed Use: **Monitor**

Drilling Start Date: **9/18/2024** Drilling End Date: **9/18/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
6	**0**	**20**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
3	**20**	**Sand**	**20/40**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**1**	**Concrete 0.5 Bags/Sacks**
1	**3**	**Bentonite 1 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Stick-Up completion** **Surface Completion by Driller**

Water Level: **14 ft.** below land surface on **2024-09-18** Measurement Method: **Observed in soil sample**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **BEST DRILLING SERVICES, INC.**

P.O. BOX 70822
Houston, TX 77270

Driller Name: **Ali Firouzbakht** License Number: **4997**

Apprentice Name: **Calistro Campozano** Apprentice Number: **56591**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**10**	**CLAY**
10	**15**	**SILT w/CLAY**
15	**20**	**Silty SAND**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**-3**	**4**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**4**	**19**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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CONFIDENTIAL BUSINESS INFORMATION

689938

STATE OF TEXAS WELL REPORT for Tracking #689938

Owner:	**ExxonMobil LCS Onshore Storage LLC**	Owner Well #:	**TW1**
Address:	**22777 Springwoods Village Pkwy Spring, TX 77389**	Grid #:	**64-06-3**
Well Location:	**Lawhon Rd China, TX 77613**	Latitude:	**29° 59' 40.09" N**
Well County:	**Jefferson**	Longitude:	**094° 16' 10.6" W**
		Elevation:	**No Data**

Type of Work: **New Well** Proposed Use: **Monitor**

Drilling Start Date: **9/19/2024** Drilling End Date: **9/19/2024**

Borehole:

Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
6	**0**	**20**

Drilling Method: **Hollow Stem Auger**

Borehole Completion: **Filter Packed**

Filter Pack Intervals:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Filter Material*	*Size*
3	**20**	**Sand**	**20/40**

Annular Seal Data:

Top Depth (ft.)	*Bottom Depth (ft.)*	*Description (number of sacks & material)*
0	**1**	**Concrete 0.5 Bags/Sacks**
1	**3**	**Bentonite 1 Bags/Sacks**

Seal Method: **Poured**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Stick-Up completion** **Surface Completion by Driller**

Water Level: **11 ft.** below land surface on **2024-09-19** Measurement Method: **Observed in soil sample**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Water Quality:

Strata Depth (ft.)	Water Type
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **No**

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **BEST DRILLING SERVICES, INC.**

P.O. BOX 70822
Houston, TX 77270

Driller Name: **Ali Firouzbakht** License Number: **4997**

Apprentice Name: **Calistro Campozano** Apprentice Number: **56591**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	Bottom (ft.)	Description
0	**1.5**	**GRAVEL Pad**
1.5	**2**	**Road Base**
2	**11**	**CLAY**
11	**12**	**Clayey SILT**
12	**20**	**SAND w/SILT**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia (in.)	Type	Material	Sch./Gage	Top (ft.)	Bottom (ft.)
2	**Riser**	**New Plastic (PVC)**	**40**	**-3**	**4**
2	**Screen**	**New Plastic (PVC)**	**40 0.010**	**4**	**19**

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

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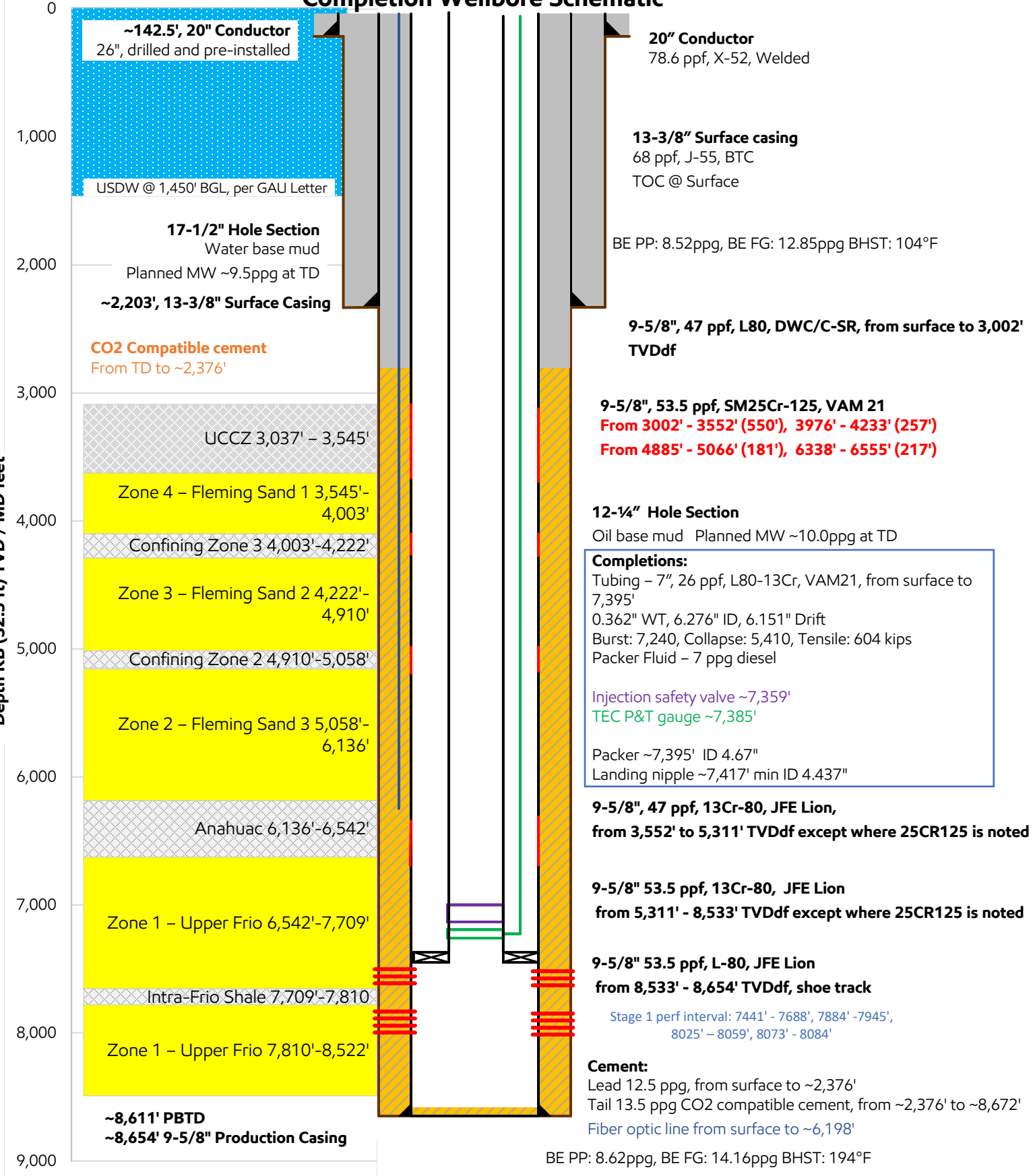
Appendix D Well Construction Schematics and Procedures

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Appendix D.1: Well Construction Design and Completion

CONFIDENTIAL BUSINESS INFORMATION

Labelle Properties Ltd No. 1
Rose CCS Project Injection Well No. 01
Completion Wellbore Schematic



CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32913
Drilling Permit # 898448
SWR Exception

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256

2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC

3. Operator Address (include street, city, state, zip):
ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

4. Lease Name: LABELLE PROPERTIES LTD

5. Well No.: 1

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 10000

9. Do you have the right to develop the minerals under any right-of-way ? [X] Yes [ ] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03

12. County: JEFFERSON

13. Surface Location [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 4.5 miles in a SE direction from China which is the nearest town in the county of the well site.

15. Section: 42

16. Block:

17. Survey: T&NO RR CO/STARK, W L

18. Abstract No.: A-874

19. Distance to nearest lease line: ft.

20. Number of contiguous acres in lease, pooled unit, or unitized tract: 569.27

21. Lease Perpendiculars: 371 ft from the NORTH line and 2016 ft from the WEST line.

22. Survey Perpendiculars: 371 ft from the NORTH line and 2016 ft from the WEST line.

23. Is this a pooled unit? [ ] Yes [X] No

24. Unitization Docket No:

25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	8700	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks
See W1 Comments attached

Certificate:
I certify that information stated in this application is true and complete, to the best of my knowledge.

Josh Calkin — Name of filer
Mar 27, 2024 — Date submitted

(281)702-5537 — Phone
Josh.Calkin@erm.com — E-mail Address (OPTIONAL)

RRC Use Only Data Validation Time Stamp: Mar 26, 2025 1:44 PM(Current Version)

CONFIDENTIAL BUSINESS INFORMATION

Permit Status: Approved

The RRC has not approved this application. Duplication or distribution of information is at the user's own risk.

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

W-1 Comments

Permit # 898448

Approved Date: Apr 05, 2024

[RRC STAFF Mar 28, 2024 4:28 PM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 4, 2024 9:05 AM]: Problems identified with this permit are resolved.; [RRC STAFF Apr 4, 2024 9:06 AM]: Per Joshua Calkin, "This well is being drilled as a stratigraphic well to gather data. At a future date, the well may be re-completed on a future date for injection."; [RRC STAFF Apr 4, 2024 9:06 AM]: Amended plat uploaded; [RRC STAFF Apr 4, 2024 9:24 AM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 5, 2024 8:06 AM]: Problems identified with this permit are resolved.; [RRC STAFF Apr 5, 2024 8:07 AM]: Per phone conversation with Josh Calkin, this is not a pooled unit.; [RRC STAFF Apr 5, 2024 8:12 AM]: Corrected acreage from 600 acres to 569.27 acres per plat and problem response from filer.

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898448	Apr 05, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32913	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	569.27

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:

(713) 869-5001

LEASE NAME	WELL NUMBER
LABELLE PROPERTIES LTD	1
LOCATION	**TOTAL DEPTH**
4.5 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 42 BLOCK ABSTRACT 874

SURVEY T&NO RR CO/STARK, W L

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
371 ft. NORTH 2016 ft. WEST	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
371 ft. NORTH 2016 ft. WEST	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	569.27	8,700	1	03
LABELLE PROPERTIES LTD			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	31 December 2024	**GAU Number:**	389625

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532913
		County:	JEFFERSON
		Lease Name:	LaBelle Properties, Ltd
		Lease Number:	
Operator No.:	101256	**Well Number:**	1
		Total Vertical	10000
		Latitude:	29.999463
		Longitude:	-94.284922
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-T&NO RR CO/STARK, W L; Abstract-874; Section-42

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Initial Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1,225 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1,450 feet at the site of the referenced well.

*(SIP Purpose Only) Water Code Section 27.046(a) requires the GAU to issue a GW-2 letter containing Non-Endangerment language prior to issuance of a class VI permit. An additional letter will be required before SIP can issue a final permit because this letter is silent on endangerment of fresh water. *

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 12/18/2024. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	28 January 2025	**GAU Number:**	390197

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532913
		County:	JEFFERSON
		Lease Name:	LaBelle Properties, Ltd
		Lease Number:	
Operator No.:	101256	**Well Number:**	1
		Total Vertical	10000
		Latitude:	29.999463
		Longitude:	-94.284922
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-T&NO RR CO/STARK, W L; Abstract-874; Section-42

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1200 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1450 feet at the site of the referenced well.

This recommendation is applicable to an area extent within a radius of 1.0 mile of this location.

The vertical geological isolation from both bases of usable quality water and underground source of drinking water is at 3,200 feet in TVD depth (for UIC Purpose Only).

Injection into the subsurface interval from 3,400 to 8,600 feet in TVD depth, as proposed in the submitted W14 (Class VI) application dated on December 18th of 2024 , WILL NOT ENDANGER the PROTECTED WATER STRATA geologically at the proposed location in this area (for UIC Purpose Only).

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 01/22/2025. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 02/12/2025
Tracking No.: 326094

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-0000

WELL INFORMATION

API 42-245-32913 **County:** JEFFERSON
Well No.: 1 **RRC District** 03
Lease LABELLE PROPERTIES LTD **Field** WILDCAT
RRC Lease 28199 **Field No.:** 00006001
Location Section: 42, Block: , Survey: T&NO RR CO/STARK, W L, Abstract: 874

Latitude 29 **Longitud** -94
This well is 4.5 **miles in a** SE
direction from CHINA,
which is the nearest town in the

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 10/03/2024

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	04/05/2024	898448
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 06/23/2024 **Date of first production after rig** 10/03/2024
Date plug back, deepening, drilling operation 06/23/2024 **Date plug back, deepening, recompletion, drilling operation** 10/03/2024
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 569.27 **Elevation** 23 GL
Total depth TVD 8672 **Total depth MD**
Plug back depth TVD 8612 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing** 42.0
Is Cementing Affidavit (Form W-15) Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:
Location of well, relative to nearest lease of lease on which this well is 371.0 **Feet from the** North **Line and** 2016.0 **Feet from the** West **Line of the** LABELLE PROPERTIES LTD **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1200.0	**Date**	03/07/2024
SWR 13 Exception		**Depth**	2230.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
1	Surface	13 3/8	17 1/2	2203			H	1204	2382.0	0	Circulated to Surface
2	Conductor	20	26	110			A	225	349.0	0	Circulated to Surface
3	Conventional Production	9 5/8	12 1/4	8654			H	2035	3829.3	0	Circulated to Surface

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
1	7	7395	7395 / WIRELINE SET, PERMANENT

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
1	No	L 7441	7688.0
2	No	L 7884	7945.0
3	No	L 8073	8084.0
4	No	L 8025	8059.0

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG)

Actual maximum pressure (PSIG) during hydraulic fracturing

fracturin

Has the hydraulic fracturing fluid disclosure been

No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)	
1	Other	PERFORATIONS	7441	8059

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
CAPROCK - DISPOSAL	No			No	NOT ENCOUNTERED
SPINDLETOP SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
FANNETT SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
BIG HILL SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
PLEISTOCENE-LISSIE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
MIOCENE - DISPOSAL	Yes	3545.0	3545.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6542.0	6542.0	Yes	LOGGED, PERFORATIONS IN THE LOWER FRIO SAND FROM 7,441'-8,084'
MARINULINA - DISPOSAL	Yes	6136.1	6136.0	Yes	LOGGED
HETEROSTEGINA - DISPOSAL	Yes	6231.0	6290.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS PERFORATED AND SHUT IN. THIS WELL HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

CASING RECORD :

NONE.

TUBING RECORD:

PRODUCING/INJECTION/DISPOSAL INTERVAL :

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION

Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	02/11/2025

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: Exxon Mobil low Carbon Solutions	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson	
Well No.: 1	API No.: 42-245-32913	Drilling Permit No.: 898448
Lease Name: Labelle Properties LTD	Lease No.:	
Field Name: Wild Cat	Field No.:	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☒ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 17 1/2"	Depth of drilled hole (ft.): 2,213	Est. % wash-out or hole enlargement: 20
Size of casing in O.D. (in.): 13 3/8"	Casing weight (lbs/ft) and grade: 68# J55	No. of centralizers used: 18
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☒ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 2,203	Top of liner (ft.): / Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): Surface	Cementing date: 6/25/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	785	XA	SEE REMARKS	1848	1486
2	419	H	SEE REMARKS	534	716
3					
Total	1204			2382	2202

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXON, LABELLE PROPERTIES, LABELLE PROPERTIES LTC #1
SLURRY 1: ECONO CEM
SKLURRY 2: HAL CEM

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

DAVID NGUYEN, SERVICE SUPERVISOR	Halliburton	Daniel Nguyen	
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	6/25/24
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James Harvey	ops. supervisor		
Typed or printed name of operator's representative	Title	Signature	
22777 Springwoods Village	Spring, TX 77389	512-949-8272	6/25/24
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	**Operator P-5 No.:**
Cementer Name: DOC ENERGY SERVICES INC	**Cementer P-5 No.:** 221887

WELL INFORMATION

District No.: 3	**County:** JEFFERSON	
Well No.: 1	**API No.:** 42-245-32913	**Drilling Permit No.:** 898448
Lease Name: LABELLE PROPERTIES LTD	**Lease No.:**	
Field Name: Wildcat	**Field No.:**	

I. CASING CEMENTING DATA

Type of casing: ☑ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 26	**Depth of drilled hole (ft.):** 110	**Est. % wash-out or hole enlargement:** 35
Size of casing in O.D. (in.): 20	**Casing weight (lbs/ft) and grade:** 78.6 ppf X-52 (Welded)	**No. of centralizers used:**
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	**Setting depth shoe (ft.):** 110	**Top of liner (ft.):** / **Setting depth liner (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):** 0	**Cementing date:** 6/14/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	225	A	4% GELL & 2% CACL2	349	167
2					
3					
Total	225			349	167

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	**Depth of drilled hole (ft.):**	**Est. % wash-out or hole enlargement:**
Size of casing in O.D. (in.):	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Tapered string drilled hole size (in.) Upper: Lower:	**Tapered string depth of drilled hole (ft.)** Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	**Tapered string casing weight(lbs/ft) and grade** Upper: Lower:	**Tapered string no. of centralizers used** Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		**Setting depth shoe (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:**

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	**Depth of drilled hole (ft.):**	**Est. % wash-out or hole enlargement:**
Size of casing in O.D. (in.):	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Tapered string drilled hole size (in.) Upper: Lower:	**Tapered string depth of drilled hole (ft.)** Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	**Tapered string casing weight(lbs/ft) and grade** Upper: Lower:	**Tapered string no. of centralizers used** Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		**Setting depth tool (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:**

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

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JERRY T MOON JR	DOC ENERGY SERVICES INC		
Name and title of cementer's representative	Cementing Company	Signature	
P.O.BOX 580	OIL CITY, LA 71061	318-995-7126	6/19/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

MICHAEL MATHIS, EXXONMOBIL	WELL OPS SUPERVISOR				
Typed or printed name of operator's representative	Title			Signature	
22777 Springwoods Village	Spring	TX	77389	512-949-8272	06/25/2024
Address	City,	State,	Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name:	Exxon Mobil Low Carbon Solution	Operator P-5 No.:	101256
Cementer Name:	Halliburton	Cementer P-5 No.:	347151

WELL INFORMATION

District No.:	03	County:	Jefferson
Well No.:	1	API No.:	42-245-32913
Drilling Permit No.:	898448		
Lease Name:	Labelle Properties LTD	Lease No.:	
Field Name:	Wildcat	Field No.:	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☑ Production

Drilled hole size (in.):	12.25"	Depth of drilled hole (ft.):	8,672'
Est. % wash-out or hole enlargement:	25%		
Size of casing in O.D. (in.):	9 5/8"	Casing weight (lbs/ft) and grade:	47/53.50 L80/CR13/CR25
No. of centralizers used:	150		
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.		Setting depth shoe (ft.):	8,654'
Top of liner (ft.):			
Setting depth liner (ft.):			
Hrs. waiting on cement before drill-out:		Calculated top of cement (ft.):	0
Cementing date:	7/11/2024		

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	775	H	SEE RAMARKS	1395	4012
2	1260	H	SEE REMARKS	2434.32	6301
3					
Total	2035			3829.32	10313

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
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CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

909436927,EXXONMOBIL LOW CARBON-EBUS,LABELLE PROPERTIES LTD,1,PRODUCTION:
SLURRY 1:CorossaCem , SLURRY 2:CorossaLock

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

ZOUHIR ROUBACHE	Halliburton			
Name and title of cementer's representative	Cementing Company		Signature	
4720 Industrial	Bossier City, LA 71112		903-986-5096	7/11/2024
Address	City, State, Zip Code		Tel: Area Code Number	Date: mo. day yr.

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James Harvey	Drlg. OPS. Supervisor			
Typed or printed name of operator's representative	Title		Signature	
22777 Spring Woods Village	Spring	Tx 77389	512-949-8272	7/13/24
Address	City,	State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON | Sperry Drilling

DGR / EWR-P4 / DIR

Powered by INSITE™

1 : 500

MD Phase Attenuation Log

Country : USA
Field : WILDCAT
Location : Lat: 29° 59' 58.84" North Long: 94° 17' 6.39" West
Well : LABELLE PROPERTIES LTD 1
Company : EXXONMOBIL LOW C SOL ON STOR LL
Rig : NABORS X33

Company	:	EXXONMOBIL LOW C SOL ON STOR LL
Rig	:	NABORS X33
Well	:	LABELLE PROPERTIES LTD 1
Field	:	WILDCAT
Country	:	USA
API Number	:	4224532913

LOCATION

Latitude : 29° 59' 58.84" North
Longitude : 94° 17' 6.39" West

StatePlane X = 3,460,521.210 usft
StatePlane Y = 13,941,119.320 usft

Other Services

Permanent Datum : Ground Level
Elevation : 26.60 ft
Log Measured From : Drill Floor
32.52 ft Above Permanent Datum
Drilling Measured From : Drill Floor

MD LOG

Elev. KB
DF 59.12 ft
GL 26.60 ft
WD

Depth Logged : 142.00 ft To 8,672.00 ft
Date Logged : 23-Jun-24 To 01-Jul-24
Total Depth MD : 8,672.00 ft TVD : 8,671.78 ft
Spud Date : 22-Jun-24

Unit No. :
Job No. :LF-XX-0909034765
Plot Type : Final
Plot Date : 24-Jul-24

Run No.	Borehole Record (MD)			Size	Casing Record (MD)		
	Size	From	To		Weight	From	To
100	17.500 in	142.00 ft	2,213.00 ft	20.000 in	94.00 lbpf	SURFACE	142.00 ft
200	12.250 in	2,213.00 ft	3,565.00 ft	13.375 in	68.00 lbpf	SURFACE	2,203.00 ft
201	12.250 in	3,565.00 ft	3,626.00 ft				
300	12.250 in	3,626.00 ft	7,481.00 ft				
301	12.250 in	7,481.00 ft	7,541.00 ft				
400	12.250 in	7,541.00 ft	8,672.00 ft				

WELL INFORMATION

MWD Run Number	100	200	300	400	
Date run completed	24-Jun-24	27-Jun-24	30-Jun-24	02-Jul-24	
Rig Bit Number	100	200	300	400	
Bit Size (in)	17.500	12.250	12.250	12.250	
Tool Nominal OD (in)	8.000	8.000	8.000	8.000	
Log Start Depth (MD, ft)	142.00	2,213.00	3,626.00	7,541.00	
Log End Depth (MD, ft)	2,213.00	3,565.00	7,481.00	8,672.00	
Drill or Wipe	Drill	Drill	Drill	Drill	
Drill/Wipe Start Date and Time	23-Jun-24 06:20	26-Jun-24 09:22	28-Jun-24 15:15	01-Jul-24 11:30	
Drill/Wipe End Date and Time	23-Jun-24 23:50	27-Jun-24 03:09	29-Jun-24 16:43	01-Jul-24 19:05	
Min Inc (deg) @ Depth (MD, ft)	0.06 @ 584.00	0.06 @ 3,400.00	0.00 @ 4,345.00	0.19 @ 8,031.00	
Max Inc (deg) @ Depth (MD, ft)	1.13 @ 1,237.00	0.67 @ 2,455.00	0.86 @ 7,189.00	0.57 @ 7,464.00	
Bit TFA(in2) / Bit Type	1.23 / GT65s	0.91 / HD65s	0.91 / HD65s	0.91 / HD65s	
Flow Rate (gpm)	700.00	650.00	650.00	750.00	
Max AV (fpm) / CV (fpm) @ MWD	84.0 / 260.0	105.9 / 105.9	182.0 / 358.0	213.0 / 540.0	
Fluid Type	Native/Spud Mud	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base	
Density (ppg) / Viscosity (spqt)	8.60 / 31.00	9.80 / 65.00	9.90 / 58.00	10.20 / 56.00	
Filtrate CL (ppm)	1,100.00	44,000.00	49,000.00	66,000.00	
pH / API Filtrate (mptm)	8.30 / 9	N/A / 7	N/A / 7	N/A / 3	
PV (cP) / YP (lhf2)	2 / 4.00	17 / 12.00	19 / 11.00	25 / 18.00	
% Solids / % Sand	4.9 / .01	9.1 / N/A	9.7 / N/A	9.8 / 0.01	
% Oil / Oil:Water Ratio	0 / 0:100	53.5 / 63:37	59 / 67:33	58 / 65:35	
Rm @ Measured Temp (degF)	0.100 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Rmf @ Measured Temp (degF)	0.100 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Rmc @ Measured Temp (degF)	0.100 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	
Max Tool Temp (degF) / Source	113.18 / HCIM	141.41 / HCIM	158.00 / PCDC	176.00 / PCDC	
Rm @ Max Tool Temp (degF)	0.0673 @ 113.18	N/A @ 141.41	N/A @ 158.00	N/A @ 176.00	
Lead MWD Engineer	Thomas Shea	Thomas Shea	Thomas Shea	Thomas Shea	
Customer Representative	James Harvey	Mike Mathis	Mike Mathis	Mike Mathis	

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM	HCIM	HCIM	
Software Version	98.43	98.43	98.43	98.43	
Sub Serial Number	11700362	11700362	11700362	11700362	
Insert Serial Number	11618726	11618726	11618726	11618726	
Date and Time Initialized	22-Jun-24 15:49	26-Jun-24 06:33	28-Jun-24 12:13	01-Jul-24 07:11	
Date and Time Read	23-Jun-24 19:41	27-Jun-24 09:17	30-Jun-24 01:03	02-Jul-24 10:40	
ECMB SW Version	N/A	N/A	N/A	N/A	

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	
Distance From Bit (ft)	39.96	70.27	70.27	70.29	
Software Version	6.43	6.43	6.43	6.43	
Sub Serial Number	10436639	10436639	10436639	10436639	
Sonde Serial Number	11902174	11902174	11902174	11902174	
Sensor ID Number	N/A	N/A	N/A	N/A	
Toolface Offset (deg)	0.00	230.30	230.30	230.30	

Gamma Ray Sensor Information

Tool Type	DGR	DGR	DGR	DGR	
Distance From Bit (ft)	24.09	59.50	59.50	59.49	
Recorded Sample Period (sec)	4	4	4	4	
Software Version	N/A	N/A	N/A	N/A	
Sub Serial Number	11618726	11618726	1161826	1161826	
Insert/Sonde Serial Number	11700362	11700362	11700362	11700362	

Resistivity Sensor Information

Tool Type	EWR-P4				
Distance From Bit (ft)	10.09				
Recorded Sample Period (sec)	4				
Software Version	1.51				
Sub Serial Number	11973885				
Receiver Insert Serial Number	11281932				
Transmitter Insert Serial Number	11193458				
Receiver Orientation	Down				

REMARKS

All depths are referenced to the driller's pipe tally.

DGXT - Gamma Ray formation exposure time
EWXT - Resistivity formation exposure time

Default 1:500 Log Smoothing:
Interval Resolution: 0.5ft
Window Interval:(+/-) 0.6ft
Gap Fill: 3.0ft

Archive Name: LABELLE_PROPERTIES_LTD_1_500MD_PHASE_ATTEN_142_8672

Plot Width: 8.25 in

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division
Tracking No.: 326094

ELECTRIC LOG STATUS REPORT

This facsimile L-1 was generated electronically from data submitted to the RRC.

FORM L-1

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 10/03/2024
Field Name WILDCAT	Drilling Permit No. 898448	
Lease Name LABELLE PROPERTIES LTD	Lease/ID No. 28199	Well No. 1
County JEFFERSON	API No. 42- 245-32913	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

Lease or ID No(s). _____

Well No(s). _____

Josh Calkin
Signature

Title

EXXONMOBIL LOW C SOL ON STOR LLC
Name (print)

(281) 702-5537
Phone

12/19/2024
Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Kristen Killen,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **June 23, 2024 to July 1, 2024** conduct or supervise the taking of Directional Surveys as follow:

- **396' to a depth of 8604' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8672'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **LABELLE PROPERTIES LTD 1** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Kristen Killen, Log Analyst

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

July 24, 2024

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
LABELLE PROPERTIES LTD 1
Permit No. 898448
Jefferson County, TX
API # 42-245-32913

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Kristen Killen, Log Analyst
Drainhole Number	-	Original
Surveyed Depths	-	396' – 8604' MWD Surveys performed by Sperry Drilling
Dates Performed	-	June 23, 2024 to July 1, 2024
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,

Kristen Killen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 909034765

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx_NAD83
Rose Prospect CCS
Labelle Properties LTD #1
42245332913
001 ST00BP00

Design: 001 ST00BP00

Sperry Drilling Services

Geodetic Report

19 July, 2024

Well Coordinates: 13,941,119.32 N, 3,460,521.21 E (29° 59' 58.84" N, 094° 17' 06.39" W)
Ground Level: 26.60 usft

Local Coordinate Origin:	Centered on Well Labelle Properties LTD #1
Viewing Datum:	(32.52') Nabors X-33 @ 59.12usft (Before Spud)
TVDs to System:	N
North Reference:	Grid
Unit System:	API US Survey Feet

Version: 5000.17 Build: 02

HALLIBURTON

Design Report for Labelle Properties LTD #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	29° 59' 58.843 N	94° 17' 6.388 W	13,941,119.32	3,460,521.21
396.00	0.31	302.42	396.00	0.57	-0.90	29° 59' 58.849 N	94° 17' 6.398 W	13,941,119.89	3,460,520.31
491.00	0.33	316.43	491.00	0.91	-1.31	29° 59' 58.852 N	94° 17' 6.403 W	13,941,120.23	3,460,519.90
584.00	0.06	160.13	584.00	1.06	-1.48	29° 59' 58.854 N	94° 17' 6.405 W	13,941,120.38	3,460,519.73
679.00	0.31	105.12	679.00	0.94	-1.21	29° 59' 58.853 N	94° 17' 6.402 W	13,941,120.26	3,460,520.00
765.00	0.25	190.83	764.99	0.70	-1.02	29° 59' 58.850 N	94° 17' 6.400 W	13,941,120.02	3,460,520.19
862.00	0.28	223.68	861.99	0.32	-1.23	29° 59' 58.846 N	94° 17' 6.402 W	13,941,119.64	3,460,519.98
956.00	0.19	251.73	955.99	0.11	-1.53	29° 59' 58.844 N	94° 17' 6.406 W	13,941,119.43	3,460,519.68
1,043.00	0.59	311.75	1,042.99	0.36	-2.00	29° 59' 58.847 N	94° 17' 6.411 W	13,941,119.68	3,460,519.21
1,139.00	0.65	324.96	1,138.99	1.13	-2.69	29° 59' 58.855 N	94° 17' 6.418 W	13,941,120.45	3,460,518.52
1,237.00	1.13	346.55	1,236.97	2.53	-3.23	29° 59' 58.869 N	94° 17' 6.424 W	13,941,121.85	3,460,517.98
1,334.00	1.02	341.03	1,333.96	4.28	-3.73	29° 59' 58.887 N	94° 17' 6.429 W	13,941,123.60	3,460,517.48
1,423.00	0.84	310.12	1,422.95	5.44	-4.49	29° 59' 58.898 N	94° 17' 6.437 W	13,941,124.76	3,460,516.72
1,519.00	0.61	306.92	1,518.94	6.21	-5.44	29° 59' 58.906 N	94° 17' 6.447 W	13,941,125.53	3,460,515.77
1,612.00	0.33	217.44	1,611.94	6.29	-5.99	29° 59' 58.907 N	94° 17' 6.454 W	13,941,125.61	3,460,515.22
1,707.00	0.42	215.22	1,706.93	5.79	-6.36	29° 59' 58.903 N	94° 17' 6.458 W	13,941,125.11	3,460,514.85
1,804.00	0.43	218.07	1,803.93	5.21	-6.79	29° 59' 58.897 N	94° 17' 6.463 W	13,941,124.53	3,460,514.42
1,894.00	0.89	271.47	1,893.93	4.96	-7.70	29° 59' 58.895 N	94° 17' 6.474 W	13,941,124.28	3,460,513.51
1,991.00	0.70	257.71	1,990.92	4.86	-9.03	29° 59' 58.894 N	94° 17' 6.489 W	13,941,124.18	3,460,512.18
2,088.00	0.31	300.25	2,087.91	4.86	-9.84	29° 59' 58.895 N	94° 17' 6.498 W	13,941,124.18	3,460,511.37
2,171.00	0.26	350.35	2,170.91	5.16	-10.06	29° 59' 58.898 N	94° 17' 6.500 W	13,941,124.48	3,460,511.15
2,267.00	0.57	26.56	2,266.91	5.80	-9.88	29° 59' 58.904 N	94° 17' 6.498 W	13,941,125.12	3,460,511.33
2,363.00	0.63	17.23	2,362.90	6.73	-9.51	29° 59' 58.913 N	94° 17' 6.494 W	13,941,126.05	3,460,511.70
2,455.00	0.67	26.51	2,454.90	7.70	-9.12	29° 59' 58.923 N	94° 17' 6.489 W	13,941,127.02	3,460,512.09
2,549.00	0.58	25.23	2,548.89	8.62	-8.68	29° 59' 58.932 N	94° 17' 6.483 W	13,941,127.94	3,460,512.53
2,645.00	0.42	12.95	2,644.89	9.40	-8.39	29° 59' 58.939 N	94° 17' 6.480 W	13,941,128.72	3,460,512.82
2,742.00	0.25	14.60	2,741.89	9.95	-8.26	29° 59' 58.945 N	94° 17' 6.478 W	13,941,129.27	3,460,512.95
2,832.00	0.32	347.80	2,831.89	10.39	-8.26	29° 59' 58.949 N	94° 17' 6.478 W	13,941,129.71	3,460,512.95
2,929.00	0.18	359.49	2,928.88	10.81	-8.32	29° 59' 58.953 N	94° 17' 6.478 W	13,941,130.13	3,460,512.89
3,025.00	0.09	307.84	3,024.88	11.00	-8.38	29° 59' 58.955 N	94° 17' 6.479 W	13,941,130.32	3,460,512.83
3,121.00	0.09	276.88	3,120.88	11.06	-8.52	29° 59' 58.956 N	94° 17' 6.480 W	13,941,130.38	3,460,512.69
3,214.00	0.13	264.11	3,213.88	11.06	-8.69	29° 59' 58.956 N	94° 17' 6.482 W	13,941,130.38	3,460,512.52
3,309.00	0.09	161.81	3,308.88	10.98	-8.78	29° 59' 58.955 N	94° 17' 6.483 W	13,941,130.30	3,460,512.43
3,400.00	0.06	225.09	3,399.88	10.87	-8.79	29° 59' 58.954 N	94° 17' 6.483 W	13,941,130.19	3,460,512.42
3,496.00	0.25	142.62	3,495.88	10.67	-8.70	29° 59' 58.952 N	94° 17' 6.482 W	13,941,129.99	3,460,512.51
3,507.17	0.25	145.70	3,507.05	10.63	-8.67	29° 59' 58.951 N	94° 17' 6.482 W	13,941,129.95	3,460,512.54
3,686.00	0.28	195.98	3,685.88	9.90	-8.57	29° 59' 58.944 N	94° 17' 6.481 W	13,941,129.22	3,460,512.64
3,782.00	0.18	201.29	3,781.88	9.53	-8.69	29° 59' 58.941 N	94° 17' 6.483 W	13,941,128.85	3,460,512.52
3,876.00	0.06	170.16	3,875.88	9.34	-8.74	29° 59' 58.939 N	94° 17' 6.483 W	13,941,128.66	3,460,512.47
3,967.00	0.22	345.14	3,966.88	9.47	-8.77	29° 59' 58.940 N	94° 17' 6.484 W	13,941,128.79	3,460,512.44
4,065.00	0.25	12.46	4,064.88	9.86	-8.78	29° 59' 58.944 N	94° 17' 6.484 W	13,941,129.18	3,460,512.43
4,161.00	0.14	3.58	4,160.88	10.18	-8.72	29° 59' 58.947 N	94° 17' 6.483 W	13,941,129.50	3,460,512.49

Design Report for Labelle Properties LTD #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
4,250.00	0.14	10.43	4,249.88	10.39	-8.70	29° 59' 58.949 N	94° 17' 6.483 W	13,941,129.71	3,460,512.51
4,345.00	0.00	91.76	4,344.88	10.51	-8.68	29° 59' 58.950 N	94° 17' 6.482 W	13,941,129.83	3,460,512.53
4,442.00	0.13	284.23	4,441.88	10.54	-8.78	29° 59' 58.951 N	94° 17' 6.483 W	13,941,129.86	3,460,512.43
4,539.00	0.28	249.99	4,538.88	10.48	-9.11	29° 59' 58.950 N	94° 17' 6.487 W	13,941,129.80	3,460,512.10
4,630.00	0.13	167.76	4,629.88	10.30	-9.30	29° 59' 58.948 N	94° 17' 6.489 W	13,941,129.62	3,460,511.91
4,725.00	0.19	159.33	4,724.88	10.05	-9.22	29° 59' 58.946 N	94° 17' 6.489 W	13,941,129.37	3,460,511.99
4,817.00	0.42	147.25	4,816.88	9.63	-8.98	29° 59' 58.942 N	94° 17' 6.486 W	13,941,128.95	3,460,512.23
4,911.00	0.25	157.32	4,910.87	9.15	-8.72	29° 59' 58.937 N	94° 17' 6.483 W	13,941,128.47	3,460,512.49
5,008.00	0.35	153.99	5,007.87	8.68	-8.51	29° 59' 58.932 N	94° 17' 6.481 W	13,941,128.00	3,460,512.70
5,099.00	0.26	82.39	5,098.87	8.46	-8.18	29° 59' 58.930 N	94° 17' 6.478 W	13,941,127.78	3,460,513.03
5,195.00	0.18	52.96	5,194.87	8.58	-7.84	29° 59' 58.931 N	94° 17' 6.474 W	13,941,127.90	3,460,513.37
5,292.00	0.42	34.84	5,291.87	8.97	-7.52	29° 59' 58.934 N	94° 17' 6.470 W	13,941,128.29	3,460,513.69
5,388.00	0.31	24.73	5,387.87	9.49	-7.21	29° 59' 58.940 N	94° 17' 6.466 W	13,941,128.81	3,460,514.00
5,482.00	0.42	342.12	5,481.87	10.05	-7.21	29° 59' 58.945 N	94° 17' 6.466 W	13,941,129.37	3,460,514.00
5,574.00	0.36	329.02	5,573.86	10.62	-7.46	29° 59' 58.951 N	94° 17' 6.468 W	13,941,129.94	3,460,513.75
5,670.00	0.53	314.29	5,669.86	11.19	-7.94	29° 59' 58.957 N	94° 17' 6.474 W	13,941,130.51	3,460,513.27
5,767.00	0.50	313.01	5,766.86	11.79	-8.57	29° 59' 58.963 N	94° 17' 6.480 W	13,941,131.11	3,460,512.64
5,858.00	0.25	295.28	5,857.86	12.14	-9.04	29° 59' 58.967 N	94° 17' 6.486 W	13,941,131.46	3,460,512.17
5,955.00	0.18	274.92	5,954.85	12.25	-9.38	29° 59' 58.968 N	94° 17' 6.489 W	13,941,131.57	3,460,511.83
6,052.00	0.25	226.53	6,051.85	12.12	-9.68	29° 59' 58.967 N	94° 17' 6.493 W	13,941,131.44	3,460,511.53
6,238.00	0.40	184.93	6,237.85	11.19	-10.03	29° 59' 58.957 N	94° 17' 6.497 W	13,941,130.51	3,460,511.18
6,428.00	0.43	142.07	6,427.85	9.97	-9.65	29° 59' 58.945 N	94° 17' 6.494 W	13,941,129.29	3,460,511.56
6,522.00	0.31	101.91	6,521.85	9.64	-9.19	29° 59' 58.942 N	94° 17' 6.488 W	13,941,128.96	3,460,512.02
6,638.00	0.35	51.62	6,637.84	9.79	-8.60	29° 59' 58.943 N	94° 17' 6.482 W	13,941,129.11	3,460,512.61
6,706.00	0.36	33.75	6,705.84	10.10	-8.32	29° 59' 58.946 N	94° 17' 6.478 W	13,941,129.42	3,460,512.89
6,803.00	0.36	13.29	6,802.84	10.65	-8.08	29° 59' 58.951 N	94° 17' 6.475 W	13,941,129.97	3,460,513.13
6,897.00	0.43	358.50	6,896.84	11.29	-8.02	29° 59' 58.958 N	94° 17' 6.474 W	13,941,130.61	3,460,513.19
6,994.00	0.44	344.45	6,993.84	12.01	-8.13	29° 59' 58.965 N	94° 17' 6.475 W	13,941,131.33	3,460,513.08
7,189.00	0.86	346.17	7,188.82	14.15	-8.68	29° 59' 58.986 N	94° 17' 6.481 W	13,941,133.47	3,460,512.53
7,284.00	0.84	340.34	7,283.81	15.50	-9.09	29° 59' 59.000 N	94° 17' 6.485 W	13,941,134.82	3,460,512.12
7,381.00	0.67	318.96	7,380.80	16.60	-9.70	29° 59' 59.011 N	94° 17' 6.491 W	13,941,135.92	3,460,511.51
7,409.00	0.45	321.74	7,408.80	16.81	-9.87	29° 59' 59.013 N	94° 17' 6.493 W	13,941,136.13	3,460,511.34
7,464.00	0.57	329.25	7,463.80	17.21	-10.15	29° 59' 59.017 N	94° 17' 6.496 W	13,941,136.53	3,460,511.06
7,653.00	0.43	306.59	7,652.79	18.44	-11.20	29° 59' 59.030 N	94° 17' 6.507 W	13,941,137.76	3,460,510.01
7,749.00	0.39	272.61	7,748.79	18.67	-11.81	29° 59' 59.032 N	94° 17' 6.514 W	13,941,137.99	3,460,509.40
7,941.00	0.31	214.26	7,940.79	18.27	-12.76	29° 59' 59.029 N	94° 17' 6.525 W	13,941,137.59	3,460,508.45
8,031.00	0.19	194.93	8,030.79	17.93	-12.93	29° 59' 59.025 N	94° 17' 6.527 W	13,941,137.25	3,460,508.28
8,123.00	0.25	138.03	8,122.79	17.63	-12.84	29° 59' 59.022 N	94° 17' 6.526 W	13,941,136.95	3,460,508.37
8,220.00	0.25	146.32	8,219.79	17.30	-12.58	29° 59' 59.019 N	94° 17' 6.524 W	13,941,136.62	3,460,508.63
8,314.00	0.36	131.85	8,313.78	16.93	-12.25	29° 59' 59.015 N	94° 17' 6.520 W	13,941,136.25	3,460,508.96
8,407.00	0.26	84.39	8,406.78	16.76	-11.82	29° 59' 59.013 N	94° 17' 6.515 W	13,941,136.08	3,460,509.39
8,501.00	0.38	54.36	8,500.78	16.96	-11.35	29° 59' 59.015 N	94° 17' 6.510 W	13,941,136.28	3,460,509.86

Design Report for Labelle Properties LTD #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
8,604.00	0.32	61.67	8,603.78	17.29	-10.82	29° 59' 59.018 N	94° 17' 6.504 W	13,941,136.61	3,460,510.39
8,672.00	0.32	61.67	8,671.78	17.47	-10.49	29° 59' 59.020 N	94° 17' 6.500 W	13,941,136.79	3,460,510.72

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,672.00	8,671.78	17.47	-10.49	Proj. to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
396.00	2,171.00	01 HAL MWD (MagVarMS) 17 1/2" Hole 396' - 2171'	3_MWD+HRGM+MS
2,267.00	8,604.00	02 HAL MWD (MagVarMS) 12 1/4" Hole 2267' - XX'	3_MWD+HRGM+MS

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
150.00	150.00	20" Conductor Casing	20	20

Design Report for Labelle Properties LTD #1 - 001 ST00BP00

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated

Directional Difficulty Index

Average Dogleg over Survey:	0.20 °/100usft	Maximum Dogleg over Survey:	0.80 °/100usft at 1,894.00 usft
Net Tortousity applicable to Plans:	0.20 °/100usft	Directional Difficulty Index:	2.984

Audit Info

North Reference Sheet for Rose Prospect CCS - Labelle Properties LTD #1 - 001 ST00BP00

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 59.12usft (Before Spud). Northing and Easting are relative to Labelle Properties LTD #1

Coordinate System is US State Plane 1983, Texas South Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 1,968,500.00usft, False Northing: 13,123,333.33usft, Scale Reduction: 0.99993037

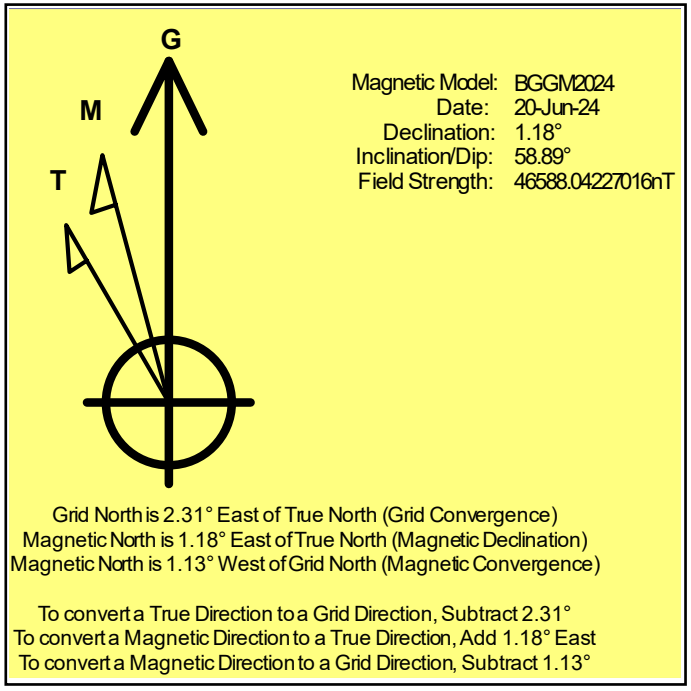
Grid Coordinates of Well: 13,941,119.32 usft N, 3,460,521.21 usft E

Geographical Coordinates of Well: 29° 59' 58.84" N, 094° 17' 06.39" W

Grid Convergence at Surface is: 2.31°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,672.00usft

the Bottom Hole Displacement is 20.38usft in the Direction of 329.02° (Grid).
Magnetic Convergence at surface is: 1.13° (20 June 2024, , BGGM2024)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898448	Apr 05, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32913	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	569.27

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:

(713) 869-5001

LEASE NAME	WELL NUMBER
LABELLE PROPERTIES LTD	1
LOCATION	**TOTAL DEPTH**
4.5 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 42 BLOCK ABSTRACT 874

SURVEY T&NO RR CO/STARK, W L

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
371 ft. NORTH 2016 ft. WEST	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
371 ft. NORTH 2016 ft. WEST	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	569.27	8,700	1	03
LABELLE PROPERTIES LTD			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

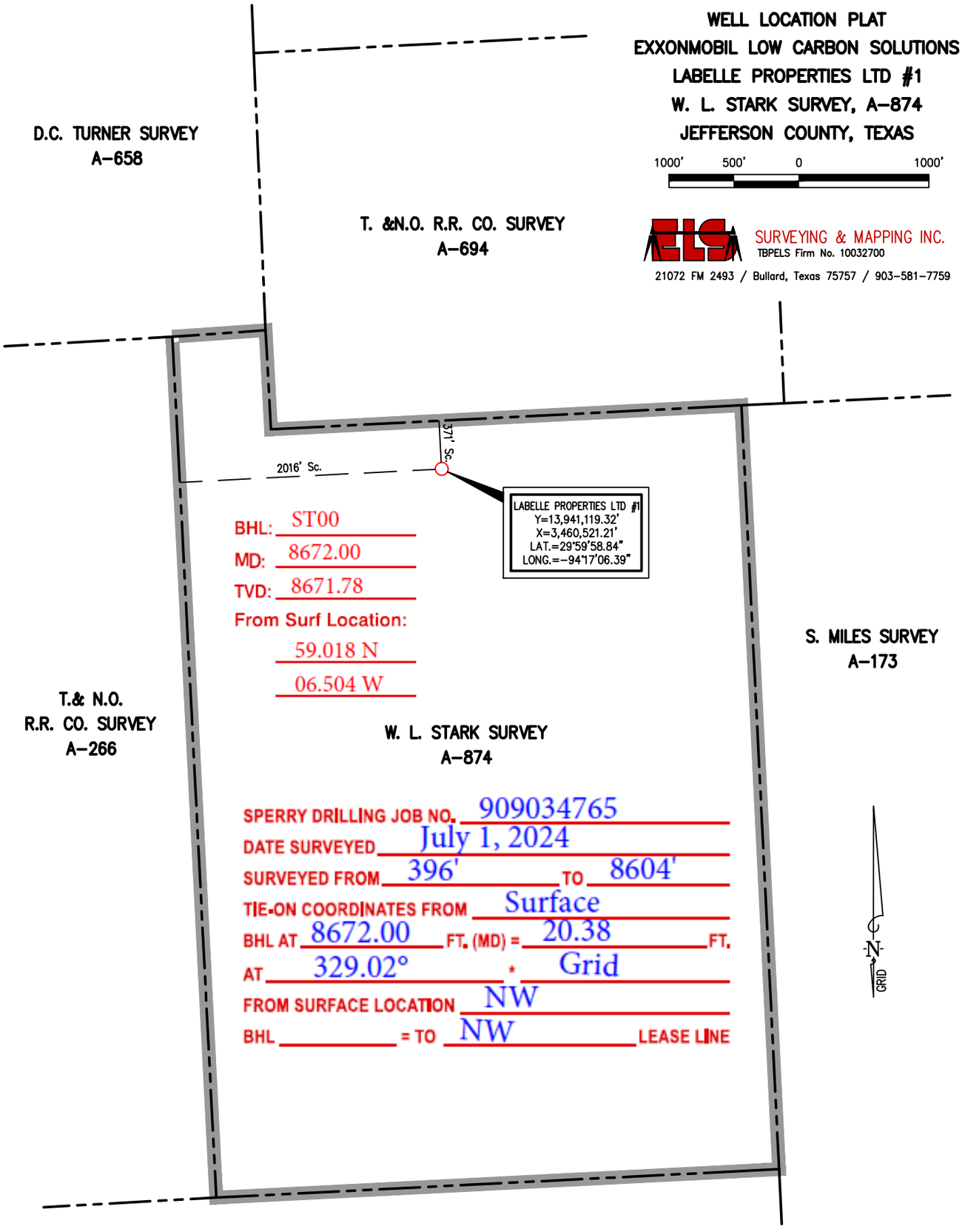
The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
LABELLE PROPERTIES LTD #1
W. L. STARK SURVEY, A-874
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759



SHL	TRACT CALLS	SURVEY CALLS	ELEV.
LABELLE PROPERTIES LTD #1	371' Sc. FNL 2016' Sc. FWL	371' Sc. FNL 2016' Sc. FWL	22.9'

Location is approximately
10.4 miles SW of Beaumont, Tx.
"FANNETT WEST" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 1.9 miles turn left (South). Drive on location.

DATE SURVEYED: 8/23/2023-8/28/2023

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data and tract acreages shown hereon were furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

STATE OF TEXAS REGISTERED
JIM G. GLASS
5262
PROFESSIONAL LAND SURVEYOR

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS - - - COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: April 2, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: ECJ FB 2744/88-97 Job No. 430923 Map No. J-0923-LOC-INJ1B

CONFIDENTIAL BUSINESS INFORMATION

CHRISTI CRADDICK, CHAIRMAN
WAYNE CHRISTIAN, COMMISSIONER
JIM WRIGHT, COMMISSIONER



DANNY SORRELLS
DIRECTOR, OIL AND GAS DIVISION

PETER FISHER, P.G.
DISTRICT DIRECTOR

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

OPERATOR Name:	EXXONMOBIL LOW C SOL ON	**RE:**	**Lease:**	LaBelle Properties, Ltd
Address1:	ATTN EDWARD E GRAHAM W1.2B.02			
Address2:	22777 SPRINGWOODS VILLAGE PKWY	**Well No:**	1	
City:	SPRING	**Sec:**	42	**Block:**
State:	TX	**County:**	JEFFERSON	
		Survey Name:	Stark, W. L.	

SWR13EX Application Number: 130360 **Drilling Permit No:**

SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for **LEASE** LaBelle Properties, Ltd ; **WELL** 1 has been approved by the Railroad Commission of Texas District Office.

a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.

b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.

c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.

d. The casing and cement program shall adhere to the following specifications:

Set 2230 feet of surface casing and circulate cement from the shoe to the ground surface.

DP 898448 - Exxonmobil, Labelle Properties Ltd Lease Well 1 (245 32913)

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

CONFIDENTIAL BUSINESS INFORMATION

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted 05/20/2024 .
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: AUDREY KUKLENZ DATE: 05/20/2024

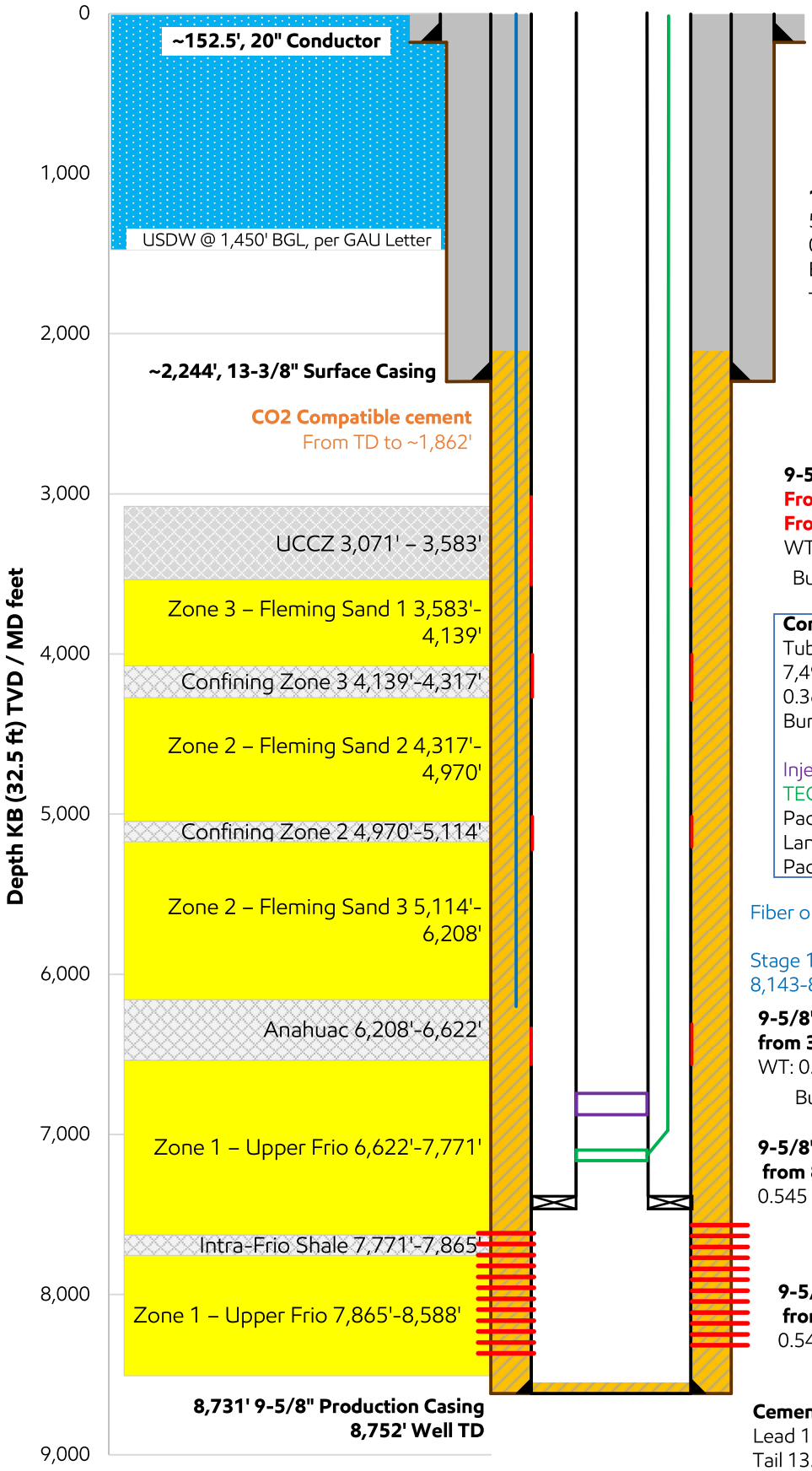
PETER FISHER, P.G.

DISTRICT DIRECTOR

CONFIDENTIAL BUSINESS INFORMATION

Rose CCS Project Bead Farm Co 2

Completion Wellbore Schematic



20" Conductor
78.6 ppf, X-52, Welded
0.375" WT, 19.25" ID
Burst: 1,950, Collapse: 320 psi, Tensile: 1,202 kips

13-3/8" Surface casing
54.5 ppf, J-55, BTC
0.380" WT, 12.615" ID, 12.459" Drift
Burst: 2,740 psi, Collapse: 1,130 psi, Tensile: 853 kips
TOC @ Surface

9-5/8", 47 ppf, L80, DWC/C-SR, from surface to 3,049' TVDdf
0.472 WT, 8.681" ID, 8.525 Drift
Burst: 6,870 psi, Collapse: 4,760 psi, 1,086 kips

9-5/8", 53.5 ppf, SM25Cr-125, VAM 21
From 3,049' – 3,597 (548'), 4,129'- 4,347' (218')
From 4,966' – 5,147' (181'), 6,428' – 6,647' (219')
WT: 0.545" 8.535" ID, 8.5" drift
Burst: 12,740 psi, Collapse: 8,440 psi, Tensile: 1,943 kips

Completions:
Tubing – 7", 26 ppf, L80-13Cr, VAM21, from surface to 7,491'
0.362" WT, 6.276" ID, 6.151" Drift
Burst: 7,240, Collapse: 5,410, Tensile: 604 kips

Injection safety valve ~7,456'
TEC P&T gauge ~7,481'
Packer ~7,491'
Landing nipple ~7,513' min ID 4.437"
Packer Fluid – 7 ppg Diesel

Fiber optic line from surface to ~6,184'

Stage 1 perf interval: 7,540'-7,769'; 7,962'-8,026'; 8,107'-8,124'; 8,143-8,160'

9-5/8", 47 ppf, 13Cr-80, JFE Lion, from 3,597' to 8,092' TVDdf except where 25CR125 is noted
WT: 0.4472" 8.681" ID, 8.525" drift
Burst: 6,870 psi, Collapse: 4,750 psi, Tensile: 1,086 kips

9-5/8" 53.5 ppf, 13Cr-80, JFE Lion from 8,092' - 8,610' TVDdf
0.545 WT, 8.535" ID, 8.50" Drift
Burst: 7,930 psi, Collapse: 6,620 psi, 1,244 kips

9-5/8" 53.5 ppf, L-80, JFE Lion from 8,610' - 8,731' TVDdf (shoe track)
0.545 WT, 8.535" ID, 8.50" Drift
Burst: 7,930 psi, Collapse: 6,620 psi, 1,244 kips

Cement:
Lead 12.5 ppg, from surface to ~1,862'
Tail 13.5 ppg CO2 compatible cement, from ~1,862' to ~8,752'

CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32911
Drilling Permit # 898449
SWR Exception

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256

2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC

3. Operator Address (include street, city, state, zip): ATTN EDWARD E GRAHAM, 22777 SPRINGWOODS VILLAGE PKWY, SPRING, TX 77389-0000

4. Lease Name: BEAD FARM CO.

5. Well No.: 2

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 10000

9. Do you have the right to develop the minerals under any right-of-way ? [X] Yes [ ] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03

12. County: JEFFERSON

13. Surface Location [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 4.5 miles in a SE direction from China which is the nearest town in the county of the well site.

15. Section: 41

16. Block:

17. Survey: T&NO RR CO

18. Abstract No.: A-266

19. Distance to nearest lease line: ft.

20. Number of contiguous acres in lease, pooled unit, or unitized tract: 470

21. Lease Perpendiculars: 692 ft from the WEST line and 2409 ft from the SOUTH line.

22. Survey Perpendiculars: 1535 ft from the WEST line and 2409 ft from the SOUTH line.

23. Is this a pooled unit? [ ] Yes [X] No

24. Unitization Docket No:

25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION — List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	8800	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks

[RRC STAFF Mar 28, 2024 4:31 PM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 4, 2024 3:00 PM]: Problems identified with this permit are resolved.; [RRC STAFF Apr 4, 2024 3:06 PM]: Changed survey line call from 692' W to 1535' W per plat.; [RRC STAFF Apr 4, 2024 3:07 PM]: Amended plat uploaded.

RRC Use Only Data Validation Time Stamp: Mar 26, 2025 1:51 PM(Current Version)

Certificate:

I certify that information stated in this application is true and complete, to the best of my knowledge.

Josh Calkin — Name of filer
Mar 27, 2024 — Date submitted

(281)702-5537 — Phone
Josh.Calkin@erm.com — E-mail Address (OPTIONAL)

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898449	Apr 04, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32911	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	470

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:

(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM CO.	2
LOCATION	**TOTAL DEPTH**
4.5 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 41 BLOCK ABSTRACT 266

SURVEY T&NO RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1535 ft. WEST 2409 ft. SOUTH	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
692 ft. WEST 2409 ft. SOUTH	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	470.00	8,800	2	03
BEAD FARM CO.			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	31 December 2024	**GAU Number:**	389717

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532911
		County:	JEFFERSON
		Lease Name:	Bead Farm Co.
		Lease Number:	
Operator No.:	101256	**Well Number:**	2
		Total Vertical	10000
		Latitude:	29.990801
		Longitude:	-94.297850
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-T&NO RR CO; Abstract-266; Section-41

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Initial Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1,200 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1,450 feet at the site of the referenced well.

*(SIP Purpose Only) Water Code Section 27.046(a) requires the GAU to issue a GW-2 letter containing Non-Endangerment language prior to issuance of a class VI permit. An additional letter will be required before SIP can issue a final permit because this letter is silent on endangerment of fresh water. *

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 12/19/2024. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	11 February 2025	**GAU Number:**	390198

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532911
		County:	JEFFERSON
		Lease Name:	Bead Farm Co.
		Lease Number:	
Operator No.:	101256	**Well Number:**	2
		Total Vertical	10000
		Latitude:	29.990801
		Longitude:	-94.297850
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-T&NO RR CO; Abstract-266; Section-41

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1,200 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1,450 feet at the site of the referenced well.

This recommendation is applicable to an area extent within a radius of 0.8 mile of this location.

The vertical geological isolation from both bases of usable quality water and underground source of drinking water is at 3,200 feet in TVD depth (for UIC Purpose Only).

Injection into the subsurface interval from 3,400 to 8,600 feet in TVD depth, as proposed in the submitted W14 (Class VI) application dated on December 18th of 2024 , WILL NOT ENDANGER the PROTECTED WATER STRATA geologically at the proposed location in this area (for UIC Purpose Only).

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 01/22/2025. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 02/20/2025
Tracking No.: 326169

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-0000

WELL INFORMATION

API 42-245-32911 **County:** JEFFERSON
Well No.: 2 **RRC District** 03
Lease BEAD FARM CO. **Field** WILDCAT
RRC Lease 28125 **Field No.:** 00006001
Location Section: 41, Block: , Survey: T&NO RR CO, Abstract: 266

Latitude 29 **Longitud** -94
This well is 4.5 **miles in a** SE
direction from CHINA,
which is the nearest town in the

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 10/09/2024

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	04/04/2024	898449
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 07/15/2024 **Date of first production after rig** 10/09/2024
Date plug back, deepening, drilling operation 07/15/2024 **Date plug back, deepening, recompletion, drilling operation** 10/09/2024
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 470.00 **Elevation** 22 GL
Total depth TVD 8752 **Total depth MD**
Plug back depth TVD 8650 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing Is Cementing Affidavit (Form W-15)** 55.5 Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:
Location of well, relative to nearest lease of lease on which this well is 692.0 **Feet from the** West **Line and** 2409.0 **Feet from the** South **Line of the** BEAD FARM CO. **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1100.0	**Date**	03/21/2024
SWR 13 Exception		**Depth**	2265.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
1	Surface	13 3/8	17 1/2	2244			H	1115	2210.4	0	Circulated to Surface
2	Conductor	20	26	120			A	230	274.0	0	Circulated to Surface
3	Conventional Production	9 5/8	12 1/4	8731			H	2010	3804.0	0	Circulated to Surface

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
1	7	7491	7491 / WIRELINE SET, PERMANENT

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
1	No	L 7540	7769.0
2	No	L 7962	8026.0
3	No	L 8107	8124.0
4	No	L 8143	8160.0

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG) hydraulic fracturing

Actual maximum pressure (PSIG) during fracturin

Has the hydraulic fracturing fluid disclosure been No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)	
1	Other	PERFORATIONS	7540	8160

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
CAPROCK - DISPOSAL	No			No	NOT ENCOUNTERED
SPINDLETOP SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
FANNETT SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
BIG HILL SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
PLEISTOCENE-LISSIE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
MIOCENE - DISPOSAL	Yes	3582.0	3583.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6621.0	6622.0	Yes	LOGGED - PERFORATIONS IN THE LOWER FRIO SAND FROM 7,540'-8,160'
MARINULINA - DISPOSAL	Yes	6208.1	6208.0	Yes	LOGGED
HETEROSTEGINA - DISPOSAL	Yes	6356.0	6357.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS PERFORATED AND SHUT IN. THIS WELL HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

CASING RECORD :

NONE.

TUBING RECORD:

PRODUCING/INJECTION/DISPOSAL INTERVAL :

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION

Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	02/10/2025

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: Exxon Mobil 100 Carbon Solutions	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson
Well No.: Bead Farm CO. #2	API No.: 42-245-32911 Drilling Permit No.: 898449
Lease Name: Bead Farm CO. #2	Lease No.:
Field Name: Wildcat	Field No.:

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☑ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 17.5"	Depth of drilled hole (ft.): 2254	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.): 13 3/8"	Casing weight (lbs/ft) and grade: 68# J55	No. of centralizers used: 19
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 2244	Top of liner (ft.): / Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date: 7/17/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	730	A	SEE RAMARKS	1719.15	2158
2	385	XH	SEE REMARKS	491.26	654
3					
Total	1115			2210.41	2812

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS
909463543,EXXONMOBIL LOW CARBON-EBUS,Bead Farm CO #2,SURFACE: SLURRY 1:EconoCem , SLURRY 2:HALCem

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

ZOUHIR ROUBACHE	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	7/17/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James Harvey	Operations Supervisor		
Typed or printed name of operator's representative	Title	Signature	
22777 Springwoods Village	Spring Tx 77389	512 949 8272	7/17/24
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name:	Bryd Oilfield	Operator P-5 No.:	
Cementer Name:	CUDD Pumping Services	Cementer P-5 No.:	191917

WELL INFORMATION

District No.:		County:	Jefferson		
Well No.:	#2	API No.:		Drilling Permit No.:	
Lease Name:	Bead Farm Co	Lease No.:			
Field Name:		Field No.:			

I. CASING CEMENTING DATA

Type of casing: [X] Conductor [ ] Surface [ ] Intermediate [ ] Liner [ ] Production

Drilled hole size (in.): 26	Depth of drilled hole (ft.): 120	Est. % wash-out or hole enlargement: 30	
Size of casing in O.D. (in.): 20	Casing weight (lbs/ft) and grade: 78.6 ppf X-52 (Welded)	No. of centralizers used:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [X] YES [ ] NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 120	Top of liner (ft.):	Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date: 7/2/2024	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	230	Class A	Plus Adds	274	182
2					
3					
Total	230			274	182

II. CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement shoe [ ] Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:	
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:	
Tapered string drilled hole size (in.) Upper: Lower:		Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] YES [ ] NO	Setting depth shoe (ft.):		
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement/DV tool [ ] Multiple parallel strings

Drilled hole size	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:	
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:	
Tapered string drilled hole size (in.) Upper: Lower:		Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] YES [ ] NO	Setting depth tool (ft.):		
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date				-	-	-	-
Size of hole of pipe (in.)	-	-	-	-	-	-	-
Depth to bottom of tubing or drill pipe (ft.)	-	-	-	-	-	-	-
Cement retainer setting depth (ft.)	-	-	-	-	-	-	-
CIBP setting depth (ft.)	-	-	-	-	-	-	-
Amount of cement on top of CIBP (ft.)	-	-	-	-	-	-	-
Sacks of cement used				-	-	-	-
Slurry volume pumped (cu. ft.)				-	-	-	-
Calculated top of plug (ft.)				-	-	-	-
Measured top of plug, if tagged (ft.)			-	-	-	-	-
Slurry weight (lbs/gal)				-	-	-	-
Class/type of cement				-	-	-	-
Perforate and squeeze (YES/NO)	-	-	-	-	-	-	-

REMARKS	
1	10 Bbls of cement to surface
2	
3	
4	

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

KELSI BARNETT	Service Supervisor	CUDD Pumping Services	Kelsi Barnett
Name and title of cementer's representative		Cementing Company	Signature

1434 CR 422	Pleasanton	TX	78064	(830)-254-4200	7/2/2024
Address	City,	State, Zip Code		Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that the data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

Michael Mathis	Rig Supervisor	
Typed or printed name of operator's representative	Title	Signature

			512	949-8272	7/2/2024
Address	City,	State, Zip Code		Tel: Area Code	Number	Date:

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on on form.

The Form W-15 should be filed with the form W-3, Plugging Record, unless the Form W-3 si signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&ptac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-outis less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: ExxonMobil Low Carbon Solution	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson	
Well No.: Bead Farm Co. #2	API No.: 42-245-32911	Drilling Permit No.: 898449
Lease Name: Bead Farm Co. #2	Lease No.:	
Field Name: Wildcat	Field No.:	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☒ Production

Drilled hole size (in.): 12-1/4"	Depth of drilled hole (ft.): 8752'	Est. % wash-out or hole enlargement: 0%
Size of casing in O.D. (in.): 9-5/8"	Casing weight (lbs/ft) and grade: 47/53.5 ppf L80/13Cr/25Cr	No. of centralizers used: 179
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 8731'	Top of liner (ft.):
		Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date: 8-1-2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	735	H	N/A	1341	1907
2	1275	H	N/A	2463	6826
3					
Total	2010			3804	8733

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXON, BEAD FARM CO, #2, PRODUCTION

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JEROD HACK, SERVICE SUPERVISOR	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	8-1-2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

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MICHAEL MATHIS	WELL OPERATIONS SUPERVISOR	
Typed or printed name of operator's representative	Title	Signature
	(512) 949-8272	08-1-2024
Address City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON | Sperry Drilling

DGR / EWR-P4 / DIR

Powered by INSITE™

1 : 500

MD Phase Attenuation Log

Country : USA
Field : WILDCAT
Location : Lat: 29° 59' 27.66" North Long: 94° 17' 52.93" West
Well : BEAD FARM CO. 2
Company : EXXONMOBIL LOW C SOL ON STOR LL
Rig : NABORS X33

Company : EXXONMOBIL LOW C SOL ON STOR LL
Rig : NABORS X33
Well : BEAD FARM CO. 2
Field : WILDCAT
Country : USA
API Number : 4224532911

LOCATION
Latitude : 29° 59' 27.66" North
Longitude : 94° 17' 52.93" West
StatePlane X = 3,456,559.210 usft
StatePlane Y = 13,937,806.680 usft

Other Services

Permanent Datum : Ground Level
Elevation : 25.90 ft
Log Measured From : Drill Floor
32.52 ft Above Permanent Datum
Drilling Measured From :

MD LOG

Elev. KB
DF 58.42 ft
GL 25.90 ft
WD

Depth Logged : 152.00 ft To 8,752.00 ft
Date Logged : 15-Jul-24 To 24-Jul-24
Total Depth MD : 8,752.00 ft TVD : 8,751.76 ft
Spud Date : 15-Jul-24

Unit No. : NA
Job No. : LF-XX-0909093079
Plot Type : Final
Plot Date : 06-Aug-24

Run No.	Borehole Record (MD)			Casing Record (MD)			
	Size	From	To	Size	Weight	From	To
100	17.500 in	152.00 ft	2,254.00 ft	20.000 in	78.60 lbpf	SURFACE	152.50 ft
200	12.250 in	2,254.00 ft	3,120.00 ft	13.375 in	68.00 lbpf	SURFACE	2,244.00 ft
201	12.250 in	3,120.00 ft	3,150.00 ft	9.625 in	47.00 lbpf	SURFACE	8,731.00 ft
300	12.250 in	3,150.00 ft	4,350.00 ft				
301	12.250 in	4,350.00 ft	4,410.00 ft				
400	12.250 in	4,410.00 ft	7,586.00 ft				
401	12.250 in	7,586.00 ft	7,647.00 ft				
500	12.250 in	7,647.00 ft	8,752.00 ft				

CONFIDENTIAL BUSINESS INFORMATION

WELL INFORMATION

MWD Run Number	100	200	300	400	500
Date run completed	16-Jul-24	18-Jul-24	20-Jul-24	22-Jul-24	25-Jul-24
Rig Bit Number	100	200	300	400	500
Bit Size (in)	17.500	12.250	12.250	12.250	12.250
Tool Nominal OD (in)	8.000	8.000	8.000	8.000	8.000
Log Start Depth (MD, ft)	152.00	2,254.00	3,150.00	4,410.00	7,647.00
Log End Depth (MD, ft)	2,254.00	3,120.00	4,350.00	7,586.00	8,752.00
Drill or Wipe	Drill	Drill	Drill	Drill	Drill
Drill/Wipe Start Date and Time	15-Jul-24 09:55	18-Jul-24 12:02	19-Jul-24 18:40	21-Jul-24 09:21	24-Jul-24 05:40
Drill/Wipe End Date and Time	15-Jul-24 21:40	18-Jul-24 17:31	20-Jul-24 03:03	22-Jul-24 15:52	24-Jul-24 19:25
Min Inc (deg) @ Depth (MD, ft)	0.06 @ 956.00	0.42 @ 2,276.00	0.09 @ 4,323.00	0.18 @ 5,208.00	0.00 @ 8,035.00
Max Inc (deg) @ Depth (MD, ft)	0.97 @ 1,621.00	0.75 @ 2,656.00	0.45 @ 3,128.00	0.56 @ 4,538.00	0.44 @ 7,753.00
Bit TFA(in2) / Bit Type	1.23 / GT65s	1.23 / HD65s	1.23 / HD65s	1.23 / HD65s	1.23 / HD65s
Flow Rate (gpm)	700.00	690.00	690.00	700.00	696.00
Max AV (fpm) / CV (fpm) @ MWD	79.0 / 46.0	61.0 / 40.0	61.5 / 43.0	43.7 / 40.0	43.7 / 40.0
Fluid Type	Native/Spud Mud	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base
Density (ppg) / Viscosity (spqt)	8.50 / 28.00	10.40 / 103.00	10.40 / 101.00	10.30 / 59.00	10.30 / 64.00
Filtrate CL (ppm)	1,100.00	46,000.00	46,000.00	67,000.00	63,000.00
pH / API Filtrate (mptm)	6.90 / 12	N/A / 12	N/A / 12	N/A / 20	N/A / 20
PV (cP) / YP (lhf2)	2 / 2.00	26 / 19.00	26 / 19.00	19 / 23.00	22 / 20.00
% Solids / % Sand	1 / .01	12.2 / 0.01	12 / .01	8.7 / 0.01	11.1 / 0.01
% Oil / Oil:Water Ratio	0 / 0:100	52 / 60:40	52 / 60:40	56 / 64:36	56 / 65:35
Rm @ Measured Temp (degF)	0.200 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmf @ Measured Temp (degF)	0.200 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	0.200 @ 74.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Max Tool Temp (degF) / Source	113.18 / HCIM	129.00 / HCIM	141.41 / HCIM	162.00 / HCIM	165.00 / HCIM
Rm @ Max Tool Temp (degF)	N/A @ 113.18	N/A @ 129.00	N/A @ 141.41	N/A @ 162.00	N/A @ 165.00
Lead MWD Engineer	Coy Lorraine	Coy Lorraine	Coy Lorraine	Coy Lorraine	Coy Lorraine
Customer Representative	James Harvey	James Harvey	James Harvey	James Harvey	James Harvey

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM	HCIM	HCIM	HCIM
Software Version	98.43	98.43	98.43	98.43	98.43
Sub Serial Number	11717163	11717163	11717163	11717163	11717163
Insert Serial Number	12522587	12522587	12522587	12522587	12522587
Date and Time Initialized	15-Jul-24 09:06	17-Jul-24 23:37	19-Jul-24 16:43	21-Jul-24 02:28	24-Jul-24 01:24
Date and Time Read	16-Jul-24 12:59	19-Jul-24 00:54	20-Jul-24 10:06	23-Jul-24 01:22	25-Jul-24 06:02
ECMB SW Version	N/A	N/A	N/A	N/A	N/A

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	PCDC
Distance From Bit (ft)	35.84	26.21	26.21	65.57	68.20
Software Version	6.43	6.43	6.43	6.43	6.43
Sub Serial Number	121840	121840	121840	121840	111
Sonde Serial Number	13008879	13008879	13008879	13008879	13008879
Sensor ID Number	N/A	N/A	N/A	N/A	N/A
Toolface Offset (deg)	0.00	0.00	0.00	282.46	271.38

Gamma Ray Sensor Information

Tool Type	DGR	DGR	DGR	DGR	DGR
Distance From Bit (ft)	25.26	15.63	15.63	54.99	57.62
Recorded Sample Period (sec)	4	4	4	4	4
Software Version	N/A	N/A	N/A	N/A	N/A
Sub Serial Number	13166196	13166196	13166196	13166196	13166196
Insert/Sonde Serial Number	11671530	11671530	11671530	11674530	11674530

Resistivity Sensor Information

Tool Type	EWR-P4				
Distance From Bit (ft)	11.03				
Recorded Sample Period (sec)	4				
Software Version	1.51				
Sub Serial Number	10673350				
Receiver Insert Serial Number	11827847				
Transmitter Insert Serial Number	11707807				
Receiver Orientation	Down				

REMARKS

All depths are referenced to the driller's pipe tally.

DGXT - Gamma Ray formation exposure time
EWXT - Resistivity formation exposure time

Default 1:500 Log Smoothing:
Interval Resolution: 0.5ft
Window Interval:(+/-) 0.6ft
Gap Fill: 3.0ft

Archive Name: BEAD_FARM_CO_2_500MD_PHASE_ATTEN_152_8752

Plot Width: 8.25 in

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division
Tracking No.: 326169

ELECTRIC LOG STATUS REPORT

This facsimile L-1 was generated electronically from data submitted to the RRC.

FORM L-1

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 10/09/2024
Field Name WILDCAT	Drilling Permit No. 898449	
Lease Name BEAD FARM CO.	Lease/ID No. 28125	Well No. 2
County JEFFERSON	API No. 42- 245-32911	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

Lease or ID No(s). _____

Well No(s). _____

Josh Calkin
Signature

Title

EXXONMOBIL LOW C SOL ON STOR LLC
Name (print)

(281) 702-5537
Phone

12/18/2024
Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Kristen Killen,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **July 15, 2024 to July 24, 2024** conduct or supervise the taking of Directional Surveys as follow:

- **204' to a depth of 8682' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8752'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **BEAD FARM CO. 2** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Kristen Killen, Log Analyst

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON
4607 HWY 90 EAST • BROUSSARD, LA 70518
PHONE 337 837 3061 • FAX 337 837 4400

July 31, 2024

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
BEAD FARM CO. 2
Permit No. 898449
Jefferson County, TX
API # 42-245-32911

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Kristen Killen, Log Analyst
Drainhole Number	-	Original
Surveyed Depths	-	204' – 8682' MWD Surveys performed by Sperry Drilling
Dates Performed	-	July 15, 2024 to July 24, 2024
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,



Kristen Killen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 908567108

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx_NAD83
Rose Prospect CCS
Bead Farm Co. #2
4224532911
002 ST00BP00

Design: 002 ST00BP00

Sperry Drilling Services

Geodetic Report

06 August, 2024

Well Coordinates: 13,937,806.68 N, 3,456,559.21 E (29° 59' 27.66" N, 094° 17' 52.93" W)
Ground Level: 25.90 usft

Local Coordinate Origin:	Centered on Well Bead Farm Co. #2
Viewing Datum:	(32.52') Nabors X-33 @ 58.42usft (Spud)
TVDs to System:	N
North Reference:	Grid
Unit System:	API US Survey Feet

Version: 5000.17 Build: 02

HALLIBURTON

Design Report for Bead Farm Co. #2 - 002 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	29° 59' 27.655 N	94° 17' 52.927 W	13,937,806.68	3,456,559.21
204.00	0.92	282.45	203.99	0.35	-1.60	29° 59' 27.659 N	94° 17' 52.945 W	13,937,807.03	3,456,557.61
317.00	0.69	283.37	316.98	0.71	-3.15	29° 59' 27.663 N	94° 17' 52.962 W	13,937,807.39	3,456,556.06
409.00	0.59	277.83	408.97	0.90	-4.16	29° 59' 27.666 N	94° 17' 52.974 W	13,937,807.58	3,456,555.05
503.00	0.55	276.15	502.97	1.01	-5.08	29° 59' 27.667 N	94° 17' 52.984 W	13,937,807.69	3,456,554.13
596.00	0.25	295.16	595.97	1.15	-5.71	29° 59' 27.669 N	94° 17' 52.991 W	13,937,807.83	3,456,553.50
689.00	0.13	286.13	688.97	1.26	-6.00	29° 59' 27.670 N	94° 17' 52.994 W	13,937,807.94	3,456,553.21
779.00	0.18	100.25	778.97	1.27	-5.95	29° 59' 27.670 N	94° 17' 52.994 W	13,937,807.95	3,456,553.26
878.00	0.22	94.50	877.97	1.22	-5.61	29° 59' 27.670 N	94° 17' 52.990 W	13,937,807.90	3,456,553.60
956.00	0.06	132.43	955.97	1.18	-5.43	29° 59' 27.669 N	94° 17' 52.988 W	13,937,807.86	3,456,553.78
1,053.00	0.18	44.89	1,052.97	1.26	-5.29	29° 59' 27.670 N	94° 17' 52.986 W	13,937,807.94	3,456,553.92
1,145.00	0.06	340.24	1,144.97	1.41	-5.20	29° 59' 27.671 N	94° 17' 52.985 W	13,937,808.09	3,456,554.01
1,239.00	0.40	289.30	1,238.96	1.56	-5.53	29° 59' 27.673 N	94° 17' 52.989 W	13,937,808.24	3,456,553.68
1,335.00	0.31	295.83	1,334.96	1.78	-6.08	29° 59' 27.675 N	94° 17' 52.995 W	13,937,808.46	3,456,553.13
1,430.00	0.45	241.44	1,429.96	1.72	-6.64	29° 59' 27.675 N	94° 17' 53.002 W	13,937,808.40	3,456,552.57
1,525.00	0.57	208.34	1,524.96	1.12	-7.19	29° 59' 27.669 N	94° 17' 53.008 W	13,937,807.80	3,456,552.02
1,621.00	0.97	195.75	1,620.95	-0.08	-7.64	29° 59' 27.657 N	94° 17' 53.014 W	13,937,806.60	3,456,551.57
1,718.00	0.92	199.79	1,717.94	-1.60	-8.12	29° 59' 27.643 N	94° 17' 53.020 W	13,937,805.08	3,456,551.09
1,906.00	0.93	203.82	1,905.91	-4.42	-9.25	29° 59' 27.615 N	94° 17' 53.034 W	13,937,802.26	3,456,549.96
1,995.00	0.81	210.03	1,994.90	-5.62	-9.86	29° 59' 27.604 N	94° 17' 53.041 W	13,937,801.06	3,456,549.35
2,092.00	0.53	241.70	2,091.89	-6.43	-10.59	29° 59' 27.596 N	94° 17' 53.050 W	13,937,800.25	3,456,548.62
2,186.00	0.42	264.00	2,185.89	-6.67	-11.32	29° 59' 27.594 N	94° 17' 53.059 W	13,937,800.01	3,456,547.89
2,218.00	0.38	217.95	2,217.89	-6.77	-11.50	29° 59' 27.593 N	94° 17' 53.061 W	13,937,799.91	3,456,547.71
2,276.00	0.42	192.90	2,275.89	-7.13	-11.67	29° 59' 27.589 N	94° 17' 53.063 W	13,937,799.55	3,456,547.54
2,372.00	0.45	186.31	2,371.89	-7.84	-11.79	29° 59' 27.582 N	94° 17' 53.064 W	13,937,798.84	3,456,547.42
2,465.00	0.53	177.70	2,464.88	-8.64	-11.81	29° 59' 27.574 N	94° 17' 53.065 W	13,937,798.04	3,456,547.40
2,560.00	0.72	219.69	2,559.88	-9.54	-12.17	29° 59' 27.566 N	94° 17' 53.070 W	13,937,797.14	3,456,547.04
2,656.00	0.75	210.71	2,655.87	-10.54	-12.88	29° 59' 27.556 N	94° 17' 53.078 W	13,937,796.14	3,456,546.33
2,751.00	0.59	212.16	2,750.86	-11.49	-13.46	29° 59' 27.547 N	94° 17' 53.085 W	13,937,795.19	3,456,545.75
2,843.00	0.50	209.35	2,842.86	-12.24	-13.91	29° 59' 27.540 N	94° 17' 53.091 W	13,937,794.44	3,456,545.30
2,936.00	0.55	200.99	2,935.86	-13.01	-14.27	29° 59' 27.532 N	94° 17' 53.095 W	13,937,793.67	3,456,544.94
3,030.00	0.43	201.88	3,029.85	-13.76	-14.56	29° 59' 27.525 N	94° 17' 53.099 W	13,937,792.92	3,456,544.65
3,128.00	0.45	214.48	3,127.85	-14.42	-14.91	29° 59' 27.519 N	94° 17' 53.103 W	13,937,792.26	3,456,544.30
3,222.00	0.45	234.79	3,221.85	-14.93	-15.42	29° 59' 27.514 N	94° 17' 53.109 W	13,937,791.75	3,456,543.79
3,316.00	0.33	225.02	3,315.84	-15.34	-15.92	29° 59' 27.510 N	94° 17' 53.115 W	13,937,791.34	3,456,543.29
3,412.00	0.31	224.75	3,411.84	-15.72	-16.30	29° 59' 27.506 N	94° 17' 53.119 W	13,937,790.96	3,456,542.91
3,505.00	0.25	207.09	3,504.84	-16.08	-16.57	29° 59' 27.503 N	94° 17' 53.122 W	13,937,790.60	3,456,542.64
3,560.05	0.27	213.40	3,559.90	-16.29	-16.69	29° 59' 27.501 N	94° 17' 53.124 W	13,937,790.39	3,456,542.52
3,600.00	0.28	217.48	3,599.84	-16.45	-16.80	29° 59' 27.499 N	94° 17' 53.125 W	13,937,790.23	3,456,542.41
3,694.00	0.33	206.67	3,693.84	-16.87	-17.06	29° 59' 27.495 N	94° 17' 53.128 W	13,937,789.81	3,456,542.15
3,789.00	0.35	223.05	3,788.84	-17.33	-17.38	29° 59' 27.491 N	94° 17' 53.132 W	13,937,789.35	3,456,541.83
3,884.00	0.22	220.41	3,883.84	-17.68	-17.70	29° 59' 27.487 N	94° 17' 53.136 W	13,937,789.00	3,456,541.51

Design Report for Bead Farm Co. #2 - 002 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
3,978.00	0.18	201.67	3,977.84	-17.95	-17.87	29° 59' 27.485 N	94° 17' 53.138 W	13,937,788.73	3,456,541.34
4,071.00	0.19	210.77	4,070.83	-18.22	-18.00	29° 59' 27.482 N	94° 17' 53.140 W	13,937,788.46	3,456,541.21
4,168.00	0.13	210.22	4,167.83	-18.45	-18.14	29° 59' 27.480 N	94° 17' 53.141 W	13,937,788.23	3,456,541.07
4,261.00	0.13	187.31	4,260.83	-18.65	-18.21	29° 59' 27.478 N	94° 17' 53.142 W	13,937,788.03	3,456,541.00
4,323.00	0.09	217.33	4,322.83	-18.76	-18.25	29° 59' 27.477 N	94° 17' 53.143 W	13,937,787.92	3,456,540.96
4,441.00	0.25	193.14	4,440.83	-19.08	-18.36	29° 59' 27.474 N	94° 17' 53.144 W	13,937,787.60	3,456,540.85
4,538.00	0.56	167.94	4,537.83	-19.75	-18.31	29° 59' 27.467 N	94° 17' 53.144 W	13,937,786.93	3,456,540.90
4,634.00	0.44	179.21	4,633.83	-20.58	-18.21	29° 59' 27.459 N	94° 17' 53.143 W	13,937,786.10	3,456,541.00
4,725.00	0.42	137.83	4,724.83	-21.18	-17.98	29° 59' 27.453 N	94° 17' 53.141 W	13,937,785.50	3,456,541.23
4,822.00	0.31	134.75	4,821.82	-21.62	-17.55	29° 59' 27.448 N	94° 17' 53.136 W	13,937,785.06	3,456,541.66
4,919.00	0.35	144.92	4,918.82	-22.05	-17.20	29° 59' 27.444 N	94° 17' 53.132 W	13,937,784.63	3,456,542.01
5,014.00	0.40	139.06	5,013.82	-22.54	-16.81	29° 59' 27.439 N	94° 17' 53.128 W	13,937,784.14	3,456,542.40
5,208.00	0.18	41.45	5,207.82	-22.82	-16.17	29° 59' 27.436 N	94° 17' 53.121 W	13,937,783.86	3,456,543.04
5,296.00	0.26	19.09	5,295.82	-22.53	-16.01	29° 59' 27.439 N	94° 17' 53.119 W	13,937,784.15	3,456,543.20
5,391.00	0.40	19.41	5,390.82	-22.01	-15.83	29° 59' 27.444 N	94° 17' 53.117 W	13,937,784.67	3,456,543.38
5,486.00	0.45	18.03	5,485.81	-21.35	-15.60	29° 59' 27.450 N	94° 17' 53.114 W	13,937,785.33	3,456,543.61
5,581.00	0.56	36.90	5,580.81	-20.62	-15.21	29° 59' 27.457 N	94° 17' 53.109 W	13,937,786.06	3,456,544.00
5,675.00	0.50	33.23	5,674.81	-19.91	-14.71	29° 59' 27.464 N	94° 17' 53.103 W	13,937,786.77	3,456,544.50
5,770.00	0.51	22.06	5,769.80	-19.17	-14.32	29° 59' 27.471 N	94° 17' 53.098 W	13,937,787.51	3,456,544.89
5,865.00	0.40	18.74	5,864.80	-18.47	-14.06	29° 59' 27.478 N	94° 17' 53.095 W	13,937,788.21	3,456,545.15
5,958.00	0.37	14.53	5,957.80	-17.87	-13.88	29° 59' 27.484 N	94° 17' 53.093 W	13,937,788.81	3,456,545.33
6,052.00	0.43	3.54	6,051.79	-17.22	-13.78	29° 59' 27.490 N	94° 17' 53.091 W	13,937,789.46	3,456,545.43
6,148.00	0.40	11.29	6,147.79	-16.53	-13.69	29° 59' 27.497 N	94° 17' 53.090 W	13,937,790.15	3,456,545.52
6,337.00	0.33	8.33	6,336.79	-15.35	-13.48	29° 59' 27.509 N	94° 17' 53.087 W	13,937,791.33	3,456,545.73
6,432.00	0.47	1.15	6,431.79	-14.69	-13.44	29° 59' 27.515 N	94° 17' 53.086 W	13,937,791.99	3,456,545.77
6,525.00	0.25	13.41	6,524.78	-14.11	-13.38	29° 59' 27.521 N	94° 17' 53.085 W	13,937,792.57	3,456,545.83
6,620.00	0.25	11.01	6,619.78	-13.70	-13.30	29° 59' 27.525 N	94° 17' 53.084 W	13,937,792.98	3,456,545.91
6,715.00	0.33	347.54	6,714.78	-13.23	-13.31	29° 59' 27.530 N	94° 17' 53.084 W	13,937,793.45	3,456,545.90
6,808.00	0.18	303.99	6,807.78	-12.89	-13.49	29° 59' 27.533 N	94° 17' 53.086 W	13,937,793.79	3,456,545.72
6,904.00	0.32	328.92	6,903.78	-12.58	-13.76	29° 59' 27.536 N	94° 17' 53.089 W	13,937,794.10	3,456,545.45
6,998.00	0.33	301.62	6,997.78	-12.21	-14.12	29° 59' 27.540 N	94° 17' 53.093 W	13,937,794.47	3,456,545.09
7,093.00	0.18	292.51	7,092.78	-12.01	-14.49	29° 59' 27.542 N	94° 17' 53.097 W	13,937,794.67	3,456,544.72
7,185.00	0.19	340.74	7,184.78	-11.81	-14.68	29° 59' 27.544 N	94° 17' 53.099 W	13,937,794.87	3,456,544.53
7,280.00	0.25	232.06	7,279.78	-11.79	-14.89	29° 59' 27.545 N	94° 17' 53.101 W	13,937,794.89	3,456,544.32
7,377.00	0.18	243.61	7,376.78	-11.99	-15.20	29° 59' 27.543 N	94° 17' 53.105 W	13,937,794.69	3,456,544.01
7,562.00	0.43	219.04	7,561.77	-12.65	-15.89	29° 59' 27.536 N	94° 17' 53.113 W	13,937,794.03	3,456,543.32
7,753.00	0.44	255.06	7,752.77	-13.40	-17.05	29° 59' 27.529 N	94° 17' 53.127 W	13,937,793.28	3,456,542.16
7,941.00	0.18	301.28	7,940.77	-13.43	-18.00	29° 59' 27.530 N	94° 17' 53.138 W	13,937,793.25	3,456,541.21
8,035.00	0.00	255.07	8,034.77	-13.36	-18.13	29° 59' 27.530 N	94° 17' 53.139 W	13,937,793.32	3,456,541.08
8,130.00	0.14	109.08	8,129.77	-13.39	-18.02	29° 59' 27.530 N	94° 17' 53.138 W	13,937,793.29	3,456,541.19
8,227.00	0.14	114.85	8,226.76	-13.48	-17.80	29° 59' 27.529 N	94° 17' 53.135 W	13,937,793.20	3,456,541.41
8,316.00	0.14	303.31	8,315.76	-13.47	-17.79	29° 59' 27.529 N	94° 17' 53.135 W	13,937,793.21	3,456,541.42

Design Report for Bead Farm Co. #2 - 002 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
8,411.00	0.18	307.83	8,410.76	-13.31	-18.01	29° 59' 27.531 N	94° 17' 53.138 W	13,937,793.37	3,456,541.20
8,506.00	0.32	289.23	8,505.76	-13.13	-18.38	29° 59' 27.533 N	94° 17' 53.142 W	13,937,793.55	3,456,540.83
8,598.00	0.25	303.28	8,597.76	-12.94	-18.79	29° 59' 27.535 N	94° 17' 53.146 W	13,937,793.74	3,456,540.42
8,682.00	0.43	313.57	8,681.76	-12.62	-19.17	29° 59' 27.538 N	94° 17' 53.150 W	13,937,794.06	3,456,540.04
8,752.00	0.43	313.57	8,751.76	-12.26	-19.55	29° 59' 27.542 N	94° 17' 53.155 W	13,937,794.42	3,456,539.66

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,752.00	8,751.76	-12.26	-19.55	Proj. to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
204.00	2,218.00	01 HAL MWD (MagVarMS) 17 1/2" Hole 204' - 2218'	3_MWD+HRGM+MS
2,276.00	8,682.00	02 HAL MWD (MagVarMS) 12 1/4" Hole 2276' - 8682'	3_MWD+HRGM+MS

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
152.50	152.50	20" Conductor Casing	20	20
2,244.00	2,243.89	13-3/8" Surface Casing	13-3/8	17-1/2
8,731.00	8,730.76	9-5/8" Production Casing	9-5/8	12-1/4

Design Report for Bead Farm Co. #2 - 002 ST00BP00

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated

Directional Difficulty Index

Average Dogleg over Survey:	0.17 °/100usft	Maximum Dogleg over Survey:	0.98 °/100usft at 2,218.00 usft
Net Tortousity applicable to Plans:	0.17 °/100usft	Directional Difficulty Index:	2.930

Audit Info

North Reference Sheet for Rose Prospect CCS - Bead Farm Co. #2 - 002 ST00BP00

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 58.42usft (Spud). Northing and Easting are relative to Bead Farm Co. #2

Coordinate System is US State Plane 1983, Texas South Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 1,968,500.00usft, False Northing: 13,123,333.33usft, Scale Reduction: 0.99992863

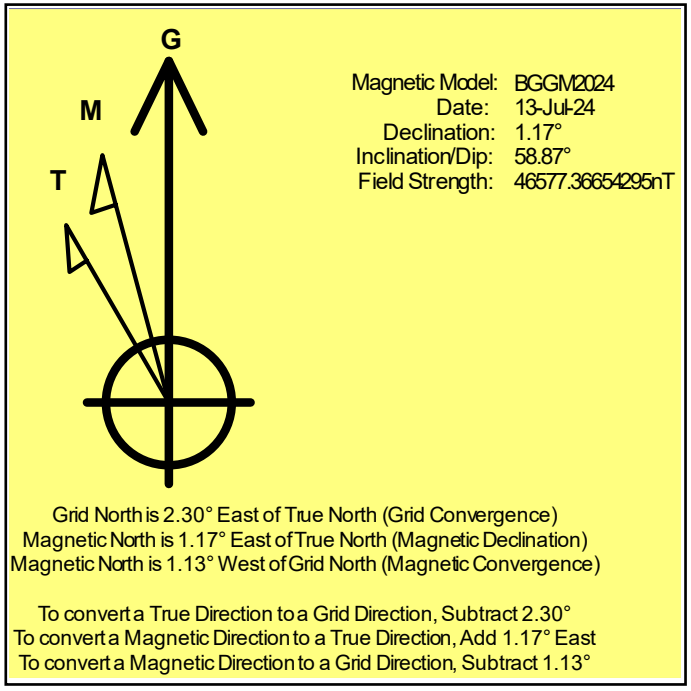
Grid Coordinates of Well: 13,937,806.68 usft N, 3,456,559.21 usft E

Geographical Coordinates of Well: 29° 59' 27.66" N, 094° 17' 52.93" W

Grid Convergence at Surface is: 2.30°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,752.00usft

the Bottom Hole Displacement is 23.07usft in the Direction of 237.91° (Grid).
Magnetic Convergence at surface is: 1.13° (13 July 2024, , BGGM2024)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898449	Apr 04, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32911	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	470

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM CO.	2
LOCATION	**TOTAL DEPTH**
4.5 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 41 BLOCK ABSTRACT 266

SURVEY T&NO RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1535 ft. WEST 2409 ft. SOUTH	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
692 ft. WEST 2409 ft. SOUTH	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	470.00	8,800	2	03
BEAD FARM CO.			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

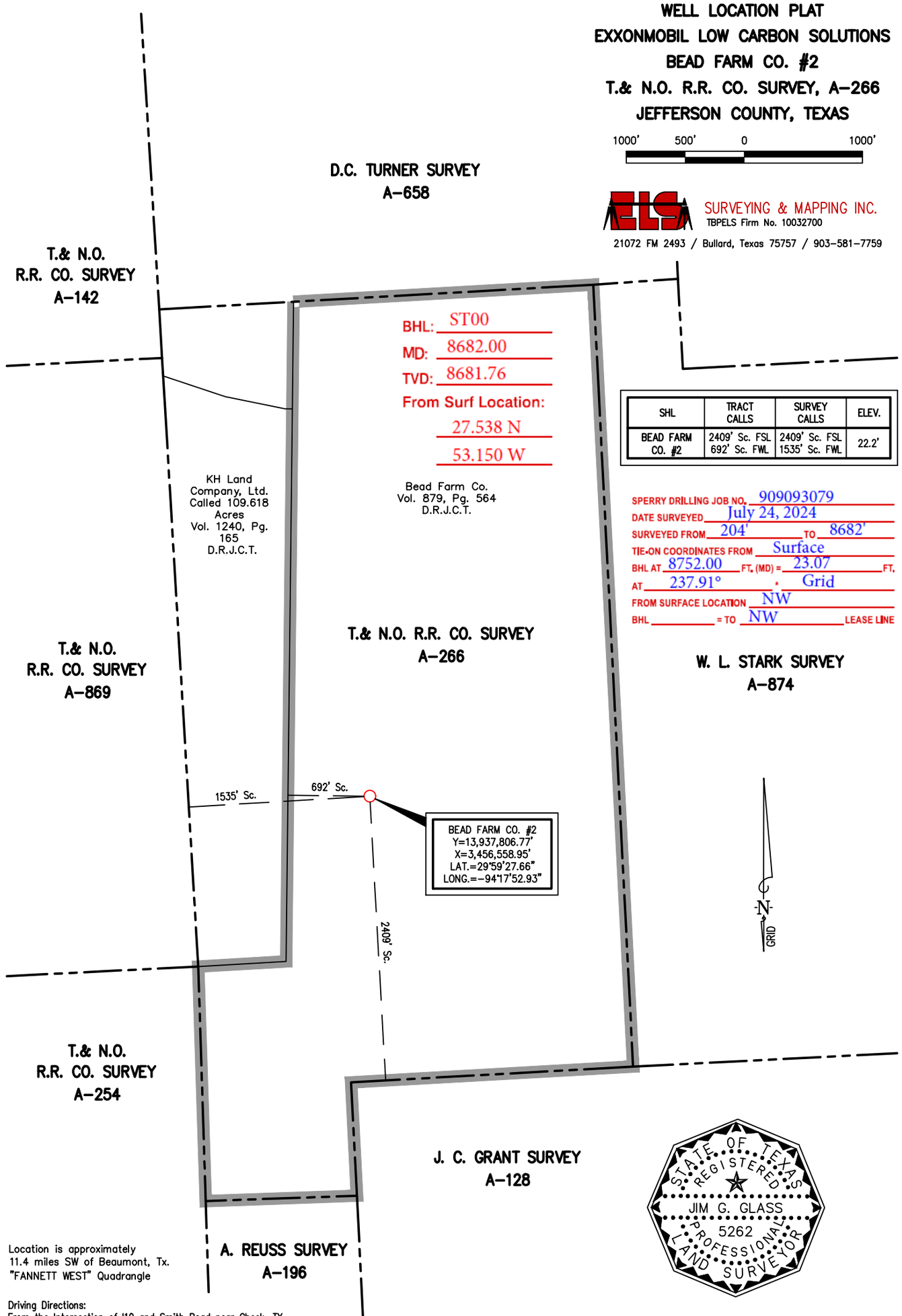
The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
BEAD FARM CO. #2
T.& N.O. R.R. CO. SURVEY, A-266
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759



SHL	TRACT CALLS	SURVEY CALLS	ELEV.
BEAD FARM CO. #2	2409' Sc. FSL 692' Sc. FWL	2409' Sc. FSL 1535' Sc. FWL	22.2'

SPERRY DRILLING JOB NO. 909093079
DATE SURVEYED July 24, 2024
SURVEYED FROM 204' TO 8682'
TIE-ON COORDINATES FROM Surface
BHL AT 8752.00 FT. (MD) = 23.07 FT.
AT 237.91° * Grid
FROM SURFACE LOCATION NW
BHL ____ = TO NW LEASE LINE

Location is approximately
11.4 miles SW of Beaumont, Tx.
"FANNETT WEST" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 2.7 miles turn left (South) on Lease Road. Go 0.68 miles. Drive on location.

DATE SURVEYED: 8/23/2023-8/28/2023

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data and tract acreages shown hereon were furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

STATE OF TEXAS
REGISTERED
JIM G. GLASS
5262
PROFESSIONAL
LAND SURVEYOR

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS - - - COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: April 2, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: ECJ FB 2744/88-97 Job No. 430923 Map No. J-0923-LOC-INJ2B

CONFIDENTIAL BUSINESS INFORMATION

CHRISTI CRADDICK, CHAIRMAN
WAYNE CHRISTIAN, COMMISSIONER
JIM WRIGHT, COMMISSIONER

DANNY SORRELLS
DIRECTOR, OIL AND GAS DIVISION
PETER FISHER, P.G.
DISTRICT DIRECTOR

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

OPERATOR Name:	EXXONMOBIL LOW C SOL ON	**RE:**	**Lease:**	Bead Farm Co.
Address1:	ATTN EDWARD E GRAHAM W1.2B.02			
Address2:	22777 SPRINGWOODS VILLAGE PKWY	**Well No:**	2	
City:	SPRING	**Sec:**	41	**Block:**
State:	TX	**County:**	JEFFERSON	
		Survey Name:	T&NO RR CO	

SWR13EX Application Number: 130361 **Drilling Permit No:**

SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for **LEASE** Bead Farm Co. ;
WELL 2 has been approved by the Railroad Commission of Texas District Office.

a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.

b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.

c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.

d. The casing and cement program shall adhere to the following specifications:

Set 2265 feet of surface casing and circulate cement from the shoe to the ground surface.

DP 909449 - Exxonmobil, Bead Farm Co. Lease Well 2 (245 32911)

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

CONFIDENTIAL BUSINESS INFORMATION

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted 05/20/2024 .
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: AUDREY KUKLENZ DATE: 05/20/2024

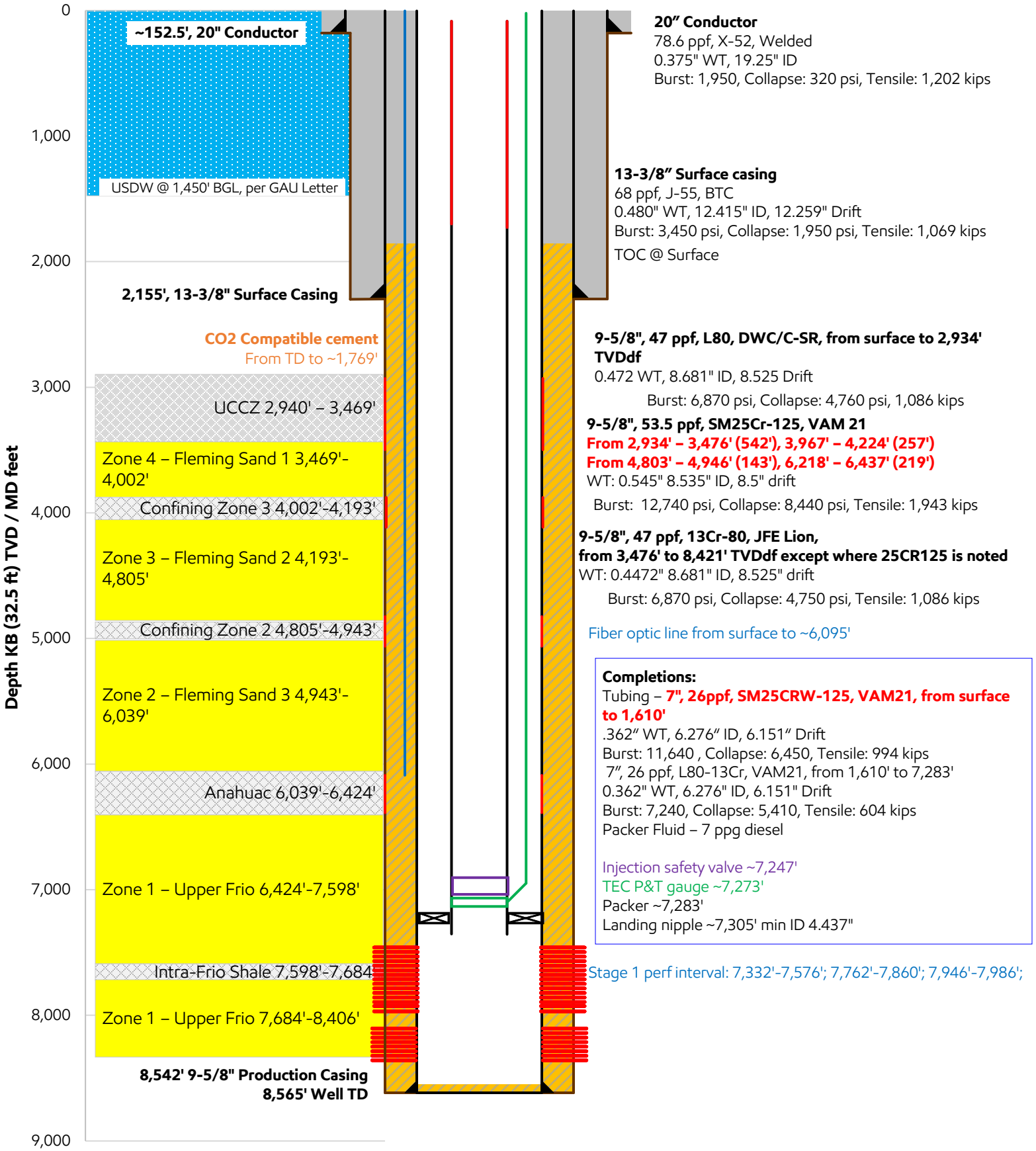
PETER FISHER, P.G.

DISTRICT DIRECTOR

CONFIDENTIAL BUSINESS INFORMATION

Rose CCS Project Bead Farm 3

Completions Wellbore Schematic



20" Conductor
78.6 ppf, X-52, Welded
0.375" WT, 19.25" ID
Burst: 1,950, Collapse: 320 psi, Tensile: 1,202 kips

13-3/8" Surface casing
68 ppf, J-55, BTC
0.480" WT, 12.415" ID, 12.259" Drift
Burst: 3,450 psi, Collapse: 1,950 psi, Tensile: 1,069 kips
TOC @ Surface

9-5/8", 47 ppf, L80, DWC/C-SR, from surface to 2,934' TVDdf
0.472 WT, 8.681" ID, 8.525 Drift
Burst: 6,870 psi, Collapse: 4,760 psi, 1,086 kips

9-5/8", 53.5 ppf, SM25Cr-125, VAM 21
From 2,934' – 3,476' (542'), 3,967' – 4,224' (257')
From 4,803' – 4,946' (143'), 6,218' – 6,437' (219')
WT: 0.545" 8.535" ID, 8.5" drift
Burst: 12,740 psi, Collapse: 8,440 psi, Tensile: 1,943 kips

9-5/8", 47 ppf, 13Cr-80, JFE Lion,
from 3,476' to 8,421' TVDdf except where 25CR125 is noted
WT: 0.4472" 8.681" ID, 8.525" drift
Burst: 6,870 psi, Collapse: 4,750 psi, Tensile: 1,086 kips

Fiber optic line from surface to ~6,095'

Completions:
Tubing – **7", 26ppf, SM25CRW-125, VAM21, from surface to 1,610'**
.362" WT, 6.276" ID, 6.151" Drift
Burst: 11,640 , Collapse: 6,450, Tensile: 994 kips
7", 26 ppf, L80-13Cr, VAM21, from 1,610' to 7,283'
0.362" WT, 6.276" ID, 6.151" Drift
Burst: 7,240, Collapse: 5,410, Tensile: 604 kips
Packer Fluid – 7 ppg diesel

Injection safety valve ~7,247'
TEC P&T gauge ~7,273'
Packer ~7,283'
Landing nipple ~7,305' min ID 4.437"

Stage 1 perf interval: 7,332'-7,576'; 7,762'-7,860'; 7,946'-7,986';

CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32912
Drilling Permit # 898450
SWR Exception

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256

2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC

3. Operator Address (include street, city, state, zip):
ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

4. Lease Name: BEAD FARM

5. Well No.: 3

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 10000

9. Do you have the right to develop the minerals under any right-of-way ? [X] Yes [ ] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03

12. County: JEFFERSON

13. Surface Location [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 3.35 miles in a SE direction from China which is the nearest town in the county of the well site.

15. Section: 8

16. Block:

17. Survey: HT&B RR CO/TURNER, D C

18. Abstract No.: A-658

19. Distance to nearest lease line: ft.

20. Number of contiguous acres in lease, pooled unit, or unitized tract: 650

21. Lease Perpendiculars: 1742 ft from the WEST line and 2937 ft from the NORTH line.

22. Survey Perpendiculars: 1742 ft from the WEST line and 2937 ft from the NORTH line.

23. Is this a pooled unit? [ ] Yes [X] No

24. Unitization Docket No:

25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	8600	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks
See W1 Comments attached

Certificate:
I certify that information stated in this application is true and complete, to the best of my knowledge.

Josh Calkin — Name of filer
Mar 27, 2024 — Date submitted

(281)702-5537 — Phone
Josh.Calkin@erm.com — E-mail Address (OPTIONAL)

RRC Use Only Data Validation Time Stamp: Mar 26, 2025 1:56 PM(Current Version)

CONFIDENTIAL BUSINESS INFORMATION

Permit Status: Approved

The RRC has not approved this application. Duplication or distribution of information is at the user's own risk.

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

W-1 Comments

Permit # 898450

Approved Date: Apr 17, 2024

[RRC STAFF Mar 28, 2024 4:19 PM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 4, 2024 3:22 PM]: Problems identified with this permit are resolved.; [RRC STAFF Apr 4, 2024 3:23 PM]: Amended plat uploaded.; [RRC STAFF Apr 4, 2024 5:01 PM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 5, 2024 11:57 AM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Apr 17, 2024 5:41 PM]: Problems identified with this permit are resolved.; [RRC STAFF Apr 17, 2024 5:41 PM]: Josh Calkin provided a revised plat on which the lease name has been updated to match the W-1.

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898450	Apr 17, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32912	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	650

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM	3
LOCATION	**TOTAL DEPTH**
3.35 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 8 BLOCK ABSTRACT 658

SURVEY HT&B RR CO/TURNER, D C

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1742 ft. WEST 2937 ft. NORTH	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
1742 ft. WEST 2937 ft. NORTH	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	650.00	8,600	3	03
BEAD FARM			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	31 December 2024	**GAU Number:**	389718

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532912
		County:	JEFFERSON
		Lease Name:	Bead Farm
		Lease Number:	
Operator No.:	101256	**Well Number:**	3
		Total Vertical	10000
		Latitude:	30.011563
		Longitude:	-94.297672
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-HT&B RR CO/TURNER, D C; Abstract-658; Section-8

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Initial Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1,225 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1,450 feet at the site of the referenced well.

*(SIP Purpose Only) Water Code Section 27.046(a) requires the GAU to issue a GW-2 letter containing Non-Endangerment language prior to issuance of a class VI permit. An additional letter will be required before SIP can issue a final permit because this letter is silent on endangerment of fresh water. *

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 12/19/2024. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	28 January 2025	**GAU Number:**	390199

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	24532912
		County:	JEFFERSON
		Lease Name:	Bead Farm
		Lease Number:	
Operator No.:	101256	**Well Number:**	3
		Total Vertical	10000
		Latitude:	30.011563
		Longitude:	-94.297672
		Datum:	NAD27

Purpose: Injection into Non-producing Zone (W-14)

Location: Survey-HT&B RR CO/TURNER, D C; Abstract-658; Section-8

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

This Recommendation is for the purpose of Class VI injection only.

Usable-quality water occurs from the land surface to a depth of 1200 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

The BASE OF UNDERGROUND SOURCES OF DRINKING WATER (USDW) is estimated to occur at a depth of 1450 feet at the site of the referenced well.

This recommendation is applicable to all wells within a radius of 1.0 mile of this location.

The vertical geological isolation from both bases of usable quality water and underground source of drinking water is at 3,200 feet in TVD depth (for UIC Purpose Only).

Injection into the subsurface interval from 3400 to 8600 feet in TVD depth, as proposed in the submitted W14 (Class VI) application dated on December 18th of 2024 , WILL NOT ENDANGER the PROTECTED WATER STRATA geologically at the proposed location in this area (for UIC Purpose Only).

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 01/22/2025. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 02/20/2025
Tracking No.: 326180

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-0000

WELL INFORMATION

API 42-245-32912 **County:** JEFFERSON
Well No.: 3 **RRC District** 03
Lease BEAD FARM **Field** WILDCAT
RRC Lease 28200 **Field No.:** 00006001
Location Section: 8, Block: , Survey: HT&B RR CO/TURNER, D C, Abstract: 658

Latitude 30 **Longitud** -94
This well is 3.35 **miles in a** SE
direction from CHINA,
which is the nearest town in the

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 10/18/2024

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	04/17/2024	898450
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 08/05/2024 **Date of first production after rig** 10/18/2024
Date plug back, deepening, drilling operation 08/05/2024 **Date plug back, deepening, recompletion, drilling operation** 10/18/2024
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 650.00 **Elevation** 23 GL
Total depth TVD 8565 **Total depth MD**
Plug back depth TVD 8466 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing Is Cementing Affidavit (Form W-15)** 45.0 Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:

Location of well, relative to nearest lease of lease on which this well is 1742.0 **Feet from the** West **Line and** 2937.0 **Feet from the** North **Line of the** BEAD FARM **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1100.0	**Date**	03/21/2024
SWR 13 Exception		**Depth**	2170.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
1	Surface	13 3/8	17 1/2	2155			H	1090	2151.0	0	Circulated to Surface
2	Conductor	20	26	120			A	230	274.0	0	Circulated to Surface
3	Conventional Production	9 5/8	12 1/4	8548			H	2015	3815.0	0	Circulated to Surface

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
1	7	7283	7283 / WIRELINE SET, PERMANENT

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
1	No	L 7332	7576.0
2	No	L 7762	7860.0
3	No	L 7946	7986.0

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG)

Actual maximum pressure (PSIG) during hydraulic fracturing

fracturin

Has the hydraulic fracturing fluid disclosure been

No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)	
1	Other	PERFORATIONS	7332	7576

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
CAPROCK - DISPOSAL	No			No	NOT ENCOUNTERED
SPINDLETOP SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
FANNETT SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
BIG HILL SALT DOME - DISPOSAL	No			No	NOT ENCOUNTERED
PLEISTOCENE-LISSIE - DISPOSAL	No			No	MUD LOGGING AND CUTTING SAMPLES WERE NOT COLLECTED IN THE SHALLOW HOLE SECTION. THEREFORE, SHALLOW FORMATIONS ENCOUNTERED COULD NOT BE CONFIRMED AS LAFAYETTE AND/OR PLEISTOCENE.
MIOCENE - DISPOSAL	Yes	3469.0	3469.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6424.0	6424.0	Yes	LOGGED, PERFORATIONS IN THE LOWER FRIO SAND FROM 7,331.5'-7,985.5'
MARINULINA - DISPOSAL	Yes	6038.5	6039.0	Yes	LOGGED
HETEROSTEGINA - DISPOSAL	Yes	6182.0	6182.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS PERFORATED AND SHUT IN. THIS WELL HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

CASING RECORD :

NONE.

TUBING RECORD:

PRODUCING/INJECTION/DISPOSAL INTERVAL :

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION

Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	02/10/2025

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: Exxon Mobil low Carbon solutions	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson	
Well No.: 3	API No.: 42-245-32912	Drilling Permit No.: 898450
Lease Name: Bead Farm	Lease No.:	
Field Name: Wild Cat	Field No.:	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☒ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 17 1/2	Depth of drilled hole (ft.): 2170	Est. % wash-out or hole enlargement: 20%
Size of casing in O.D. (in.): 13 3/8	Casing weight (lbs/ft) and grade: 68# J55	No. of centralizers used: 18
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 2,155	Top of liner (ft.):
		Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date: 08/07/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	705	A		1660	2390
2	385	XH		491	653
3					
Total	1090			2151	3043

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date: 07/04/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1		H			
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXONMOBIL BEAD FARM CO #3 SO#0909508176 SLURRY #1 ECONOCEM SLURRY #2 HALCEM

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

MOHAMED MOUNIR MEKAKDA	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	08/07/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James Harvey	Operations Sup		
Typed or printed name of operator's representative	Title	Signature	
22777 Springwoods Village Spring Tx 77389	512	949 8272	8/8/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name:	Byrd	Operator P-5 No.:	
Cementer Name:	CUDD Pumping Services	Cementer P-5 No.:	191917

WELL INFORMATION

District No.:		County:	Atacosa		
Well No.:	Bead Farm Co #3	API No.:		Drilling Permit No.:	
Lease Name:	Bead Farm Co #3	Lease No.:			
Field Name:		Field No.:			

I. CASING CEMENTING DATA

Type of casing: [x] Conductor [ ] Surface [ ] Intermediate [ ] Liner [ ] Production

Drilled hole size (in.): 26	Depth of drilled hole (ft.): 120	Est. % wash-out or hole enlargement: 30	
Size of casing in O.D. (in.): 20	Casing weight (lbs/ft) and grade: 78.6 ppf X-52 Welded)	No. of centralizers used:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [x] YES [ ] NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 120	Top of liner (ft.):	
		Setting depth liner (ft.):	
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date:	7.26.24

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	230	A	See remarks	274	182
2					
3					
4	230			274	182

II. CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement shoe [ ] Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:	
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:	
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:		
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] YES [ ] NO	Setting depth shoe (ft.):		
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement/DV tool [ ] Multiple parallel strings

Drilled hole size	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:	
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:	
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:		
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] YES [ ] NO	Setting depth tool (ft.):		
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date				-	-	-	-
Size of hole of pipe (in.)	-	-	-	-	-	-	-
Depth to bottom of tubing or drill pipe (ft.)	-	-	-	-	-	-	-
Cement retainer setting depth (ft.)	-	-	-	-	-	-	-
CIBP setting depth (ft.)	-	-	-	-	-	-	-
Amount of cement on top of CIBP (ft.)	-	-	-	-	-	-	-
Sacks of cement used				-	-	-	-
Slurry volume pumped (cu. ft.)				-	-	-	-
Calculated top of plug (ft.)				-	-	-	-
Measured top of plug, if tagged (ft.)			-	-	-	-	-
Slurry weight (lbs/gal)				-	-	-	-
Class/type of cement				-	-	-	-
Perforate and squeeze (YES/NO)	-	-	-	-	-	-	-

REMARKS	
1	Tail-100% Cl A + 1% SA001
2	
3	
4	

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

Scott Womelsdorf	Service Supervisor	CUDD Pumping Services	Scott Womelsdorf
Name and title of cementer's representative		Cementing Company	Signature

1434 CR 422	Pleasanton	TX	78064	(830)-254-4200	7.26.24
Address	City,	State,	Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that the data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

MICHAEL MATHIS	WELL OPERATIONS SUPERVISOR	
Typed or printed name of operator's representative	Title	Signature

				(512) 949-8292	7/26/2024
Address	City,	State,	Zip Code	Tel: Area Code Number	Date

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on on form.

The Form W-15 should be filed with the form W-3, Plugging Record, unless the Form W-3 si signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&ptac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-outis less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: ExxonMobil Low Carbon Solution	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 03	County: Jefferson	
Well No.: 3	API No.: 42-245-32912	Drilling Permit No.: 898450
Lease Name: Bead Farm	Lease No.:	
Field Name: Wildcat	Field No.:	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☒ Production

Drilled hole size (in.): 12-1/4"	Depth of drilled hole (ft.): 8565'	Est. % wash-out or hole enlargement: 17%
Size of casing in O.D. (in.): 9-5/8"	Casing weight (lbs/ft) and grade: 47.5/53ppf L80/13Cr/25Cr	No. of centralizers used: 170
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 8548'	Top of liner (ft.): / Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date: 8-27-2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	725	H	N/A	1323	691
2	1290	H	N/A	2492	7732
3					
Total	2015			3815	8423

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXONMOBILE, BEAD FARM, #3, PRODUCTION

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JEROD HACK, SERVICE SUPERVISOR	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	08-27-2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

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MICHAEL MATHIS	WELLS OPERATIONS SUPERVISOR		
Typed or printed name of operator's representative	Title	Signature	
			08-27-2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

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D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON | Sperry Drilling

DGR / EWR-P4 / DIR

Powered by INSITE™

1 : 500

MD Phase Attenuation Log

Country : USA
Field : WILDCAT
Location : Lat: 30° 0' 42.40" North Long: 94° 17' 52.29" West
Well : BEAD FARM 3
Company : EXXONMOBIL LOW C SOL ON STOR LL
Rig : NABORS X33

Company	:	EXXONMOBIL LOW C SOL ON STOR LL
Rig	:	NABORS X33
Well	:	BEAD FARM 3
Field	:	WILDCAT
Country	:	USA
API Number	:	4224532912

LOCATION

Latitude : 30° 0' 42.40" North
Longitude : 94° 17' 52.29" West

UTM X = 3,456,312.030 usft
UTM Y = 13,945,353.690 usft

Other Services

Permanent Datum : Ground Level
Elevation : 27.00 ft
Log Measured From : Drill Floor
32.52 ft Above Permanent Datum
Drilling Measured From : Drill Floor

MD LOG

Elev. KB
DF 59.52 ft
GL 27.00 ft
WD

Depth Logged : 120.00 ft To 8,565.00 ft
Date Logged : 05-Aug-24 To 14-Aug-24
Total Depth MD : 8,565.00 ft TVD : 8,564.26 ft
Spud Date : 05-Aug-24

Unit No. : N/A
Job No. : LF-XX-0909035053
Plot Type : Final
Plot Date : 10-Sep-24

Run No.	Borehole Record (MD)			Size	Casing Record (MD)		
	Size	From	To		Weight	From	To
100	17.500 in	120.00 ft	2,170.00 ft	20.000 in	146.64 lbpf	SURFACE	120.00 ft
200	12.250 in	2,170.00 ft	3,333.00 ft	13.375 in	66.10 lbpf	SURFACE	2,155.00 ft
201	12.250 in	3,333.00 ft	3,394.00 ft				
300	12.250 in	3,394.00 ft	3,503.00 ft				
301	12.250 in	3,503.00 ft	3,515.00 ft				
302	12.250 in	3,515.00 ft	3,572.00 ft				
400	12.250 in	3,572.00 ft	7,770.00 ft				
401	12.250 in	7,770.00 ft	7,815.00 ft				
500	12.250 in	7,815.00 ft	8,565.00 ft				

WELL INFORMATION

MWD Run Number	100	200	300	400	500
Date run completed	06-Aug-24	09-Aug-24	10-Aug-24	12-Aug-24	15-Aug-24
Rig Bit Number	100	200	300	400	500
Bit Size (in)	17.500	12.250	12.250	12.250	12.250
Tool Nominal OD (in)	8.000	8.000	8.000	8.000	8.000
Log Start Depth (MD, ft)	120.00	2,170.00	3,394.00	3,572.00	7,815.00
Log End Depth (MD, ft)	2,170.00	3,333.00	3,503.00	7,770.00	8,565.00
Drill or Wipe	Drill	Drill	Drill and Wipe	Drill and Wipe	Drill and Wipe
Drill/Wipe Start Date and Time	05-Aug-24 23:00	08-Aug-24 17:40	10-Aug-24 02:03	11-Aug-24 13:09	14-Aug-24 08:26
Drill/Wipe End Date and Time	06-Aug-24 11:10	09-Aug-24 03:17	10-Aug-24 04:37	12-Aug-24 13:50	14-Aug-24 08:26
Min Inc (deg) @ Depth (MD, ft)	0.13 @ 317.00	0.67 @ 3,304.00	0.92 @ 3,471.00	0.13 @ 7,374.00	0.13 @ 7,754.00
Max Inc (deg) @ Depth (MD, ft)	0.92 @ 2,002.00	1.00 @ 2,568.00	0.98 @ 3,411.00	2.27 @ 3,693.00	0.75 @ 7,949.00
Bit TFA(in2) / Bit Type	1.23 / GT65s	1.23 / HD65s	1.23 / HD65s	1.23 / HD65s	1.23 / HD65s
Flow Rate (gpm)	700.00	750.00	750.00	740.00	689.00
Max AV (fpm) / CV (fpm) @ MWD	80.0 / 46.0	54.0 / 35.0	43.0 / 32.0	45.0 / 32.0	43.0 / 38.0
Fluid Type	Native/Spud Mud	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base	Diesel Mud Base
Density (ppg) / Viscosity (spqt)	9.20 / 34.00	10.35 / 74.00	10.35 / 68.00	10.40 / 65.00	10.40 / 65.00
Filtrate CL (ppm)	1,300.00	61,000.00	64,000.00	66,000.00	60,000.00
pH / API Filtrate (mptm)	8.00 / 8	N/A / 12	N/A / 0	N/A / 0	N/A / 0
PV (cP) / YP (lhf2)	4 / 3.00	24 / 32.00	23 / 21.00	21 / 24.00	16 / 18.00
% Solids / % Sand	4.9 / 0	10.2 / 0	11 / 0	11.4 / .1	11.7 / 0
% Oil / Oil:Water Ratio	0 / 0:100	54 / 62:38	52 / 60:40	55.5 / 65:35	58.5 / 68:32
Rm @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmf @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Rmc @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A	N/A @ N/A	N/A @ N/A	N/A @ N/A
Max Tool Temp (degF) / Source	127.29 / HCIM	152.00 / HCIM	130.82 / HCIM	173.18 / HCIM	169.65 / HCIM
Rm @ Max Tool Temp (degF)	N/A @ 127.29	N/A @ 152.00	N/A @ 130.82	N/A @ 173.18	N/A @ 169.65
Lead MWD Engineer	Nathan Lakin	Nathan Lakin	Nathan Lakin	Nathan Lakin	Nathan Lakin
Customer Representative	N/A	N/A	N/A	N/A	N/A

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM	HCIM	HCIM	HCIM
Software Version	98.43	98.43	98.43	98.43	98.43
Sub Serial Number	11432374	11432374	11432374	11432374	11432374
Insert Serial Number	11753209	11753209	11753209	11753209	11753209
Date and Time Initialized	05-Aug-24 19:34	08-Aug-24 10:27	09-Aug-24 22:54	11-Aug-24 06:34	13-Aug-24 21:15
Date and Time Read	07-Aug-24 01:00	09-Aug-24 07:20	12-Aug-24 14:30	12-Aug-24 23:30	14-Aug-24 20:45
ECMB SW Version	N/A	N/A	N/A	N/A	N/A

Directional Sensor Information

Tool Type	PCDC	PCDC	PCDC	PCDC	PCDC
Distance From Bit (ft)	36.08	26.50	26.50	66.33	66.72
Software Version	6.43	6.43	6.43	6.43	6.43
Sub Serial Number	10435619	10435619	10435619	10435619	10435619
Sonde Serial Number	13008879	13008879	13008879	13008879	13008879
Sensor ID Number	N/A	N/A	N/A	N/A	N/A
Toolface Offset (deg)	0.00	0.00	0.00	54.00	276.00

Gamma Ray Sensor Information

Tool Type	DGR	DGR	DGR	DGR	DGR
Distance From Bit (ft)	25.64	16.06	16.06	55.82	56.28
Recorded Sample Period (sec)	4	4	4	4	4
Software Version	N/A	N/A	N/A	N/A	N/A
Sub Serial Number	11654485	11654485	11654485	11654485	11654485
Insert/Sonde Serial Number	11671533	11671533	11671533	11671533	11671533

Resistivity Sensor Information

Tool Type	EWR-P4				
Distance From Bit (ft)	11.55				
Recorded Sample Period (sec)	4				
Software Version	1.51				
Sub Serial Number	10673350				
Receiver Insert Serial Number	11827847				
Transmitter Insert Serial Number	11707807				
Receiver Orientation	Down				

REMARKS

All depths are referenced to the driller's pipe tally.

DGXT - Gamma Ray formation exposure time
EWXT - Resistivity formation exposure time

Default 1:500 Log Smoothing:
Interval Resolution: 0.5ft
Window Interval:(+/-) 0.6ft
Gap Fill: 3.0ft

Archive Name: BEAD_FARM_3_500MD_PHASE_ATTEN_120_8565

Plot Width: 8.25 in

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division

ELECTRIC LOG STATUS REPORT

FORM L-1

Tracking No.: 326180

This facsimile L-1 was generated electronically from data submitted to the RRC.

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 10/18/2024
Field Name WILDCAT	Drilling Permit No. 898450	
Lease Name BEAD FARM	Lease/ID No. 28200	Well No. 3
County JEFFERSON	API No. 42- 245-32912	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

Lease or ID No(s). _____

Well No(s). _____

Josh Calkin
Signature

Title

EXXONMOBIL LOW C SOL ON STOR LLC
Name (print)

(281) 702-5537
Phone

12/18/2024
Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Kristen Killen,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **August 5, 2024 to August 14, 2024** conduct or supervise the taking of Directional Surveys as follow:

- **317' to a depth of 8497' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8565'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **BEAD FARM 3** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Kristen Killen, Log Analyst

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON
4607 HWY 90 EAST • BROUSSARD, LA 70518
PHONE 337 837 3061 • FAX 337 837 4400

September 9, 2024

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
BEAD FARM 3
Permit No. 898450
Jefferson County, TX
API # 42-245-32912

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Kristen Killen, Log Analyst
Drainhole Number	-	Original
Surveyed Depths	-	317' – 8497' MWD Surveys performed by Sperry Drilling
Dates Performed	-	August 5, 2024 to August 14, 2024
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,



Kristen Killen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 909035053

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx_NAD83
Rose Prospect CCS
Bead Farm #3

003 ST00BP00

Design: 003 ST00BP00

Sperry Drilling Services

Geodetic Report

22 August, 2024

Well Coordinates: 13,945,353.69 N, 3,456,312.03 E (30° 00' 42.40" N, 094° 17' 52.29" W)
Ground Level: 27.00 usft

Local Coordinate Origin:	Centered on Well Bead Farm #3
Viewing Datum:	(32.52') Nabors X-33 @ 59.52usft (Plan)
TVDs to System:	N
North Reference:	Grid
Unit System:	API US Survey Feet

Version: 5000.17 Build: 02

HALLIBURTON

Design Report for Bead Farm #3 - 003 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	30° 0' 42.403 N	94° 17' 52.286 W	13,945,353.69	3,456,312.03
317.00	0.13	105.78	317.00	-0.10	0.35	30° 0' 42.402 N	94° 17' 52.282 W	13,945,353.59	3,456,312.38
405.00	0.48	59.26	405.00	0.06	0.76	30° 0' 42.403 N	94° 17' 52.277 W	13,945,353.75	3,456,312.79
499.00	0.31	43.43	499.00	0.45	1.27	30° 0' 42.407 N	94° 17' 52.271 W	13,945,354.14	3,456,313.30
593.00	0.18	41.92	593.00	0.74	1.55	30° 0' 42.410 N	94° 17' 52.268 W	13,945,354.43	3,456,313.58
685.00	0.22	50.85	684.99	0.96	1.78	30° 0' 42.412 N	94° 17' 52.265 W	13,945,354.65	3,456,313.81
768.00	0.25	41.72	767.99	1.20	2.02	30° 0' 42.414 N	94° 17' 52.262 W	13,945,354.89	3,456,314.05
865.00	0.18	5.76	864.99	1.51	2.18	30° 0' 42.417 N	94° 17' 52.260 W	13,945,355.20	3,456,314.21
963.00	0.25	336.43	962.99	1.86	2.11	30° 0' 42.421 N	94° 17' 52.261 W	13,945,355.55	3,456,314.14
1,060.00	0.45	349.02	1,059.99	2.43	1.95	30° 0' 42.426 N	94° 17' 52.262 W	13,945,356.12	3,456,313.98
1,157.00	0.39	36.90	1,156.99	3.06	2.08	30° 0' 42.433 N	94° 17' 52.261 W	13,945,356.75	3,456,314.11
1,247.00	0.76	43.05	1,246.98	3.74	2.67	30° 0' 42.439 N	94° 17' 52.254 W	13,945,357.43	3,456,314.70
1,338.00	0.50	80.63	1,337.98	4.25	3.47	30° 0' 42.444 N	94° 17' 52.244 W	13,945,357.94	3,456,315.50
1,436.00	0.38	73.99	1,435.98	4.41	4.21	30° 0' 42.445 N	94° 17' 52.236 W	13,945,358.10	3,456,316.24
1,527.00	0.56	41.34	1,526.97	4.83	4.79	30° 0' 42.449 N	94° 17' 52.229 W	13,945,358.52	3,456,316.82
1,623.00	0.14	230.38	1,622.97	5.10	5.01	30° 0' 42.452 N	94° 17' 52.227 W	13,945,358.79	3,456,317.04
1,720.00	0.88	240.64	1,719.97	4.66	4.27	30° 0' 42.447 N	94° 17' 52.235 W	13,945,358.35	3,456,316.30
1,815.00	0.90	236.11	1,814.96	3.89	3.01	30° 0' 42.440 N	94° 17' 52.250 W	13,945,357.58	3,456,315.05
1,908.00	0.86	241.23	1,907.94	3.15	1.80	30° 0' 42.433 N	94° 17' 52.264 W	13,945,356.84	3,456,313.83
2,002.00	0.92	198.67	2,001.93	2.09	0.94	30° 0' 42.423 N	94° 17' 52.274 W	13,945,355.78	3,456,312.97
2,095.00	0.78	198.22	2,094.92	0.78	0.50	30° 0' 42.411 N	94° 17' 52.280 W	13,945,354.47	3,456,312.53
2,132.00	0.86	199.33	2,131.92	0.28	0.33	30° 0' 42.406 N	94° 17' 52.282 W	13,945,353.97	3,456,312.36
2,181.00	0.97	198.19	2,180.91	-0.46	0.08	30° 0' 42.398 N	94° 17' 52.285 W	13,945,353.23	3,456,312.11
2,278.00	0.94	195.43	2,277.90	-2.01	-0.39	30° 0' 42.383 N	94° 17' 52.291 W	13,945,351.68	3,456,311.64
2,374.00	0.96	190.75	2,373.89	-3.56	-0.75	30° 0' 42.368 N	94° 17' 52.296 W	13,945,350.13	3,456,311.28
2,472.00	0.97	201.76	2,471.87	-5.13	-1.21	30° 0' 42.353 N	94° 17' 52.302 W	13,945,348.56	3,456,310.82
2,568.00	1.00	206.11	2,567.86	-6.64	-1.88	30° 0' 42.338 N	94° 17' 52.310 W	13,945,347.05	3,456,310.15
2,663.00	0.89	206.72	2,662.85	-8.04	-2.58	30° 0' 42.325 N	94° 17' 52.319 W	13,945,345.65	3,456,309.45
2,755.00	0.79	205.85	2,754.84	-9.25	-3.17	30° 0' 42.313 N	94° 17' 52.326 W	13,945,344.44	3,456,308.86
2,847.00	0.75	212.30	2,846.83	-10.33	-3.77	30° 0' 42.302 N	94° 17' 52.333 W	13,945,343.36	3,456,308.26
2,940.00	0.81	208.77	2,939.82	-11.42	-4.41	30° 0' 42.292 N	94° 17' 52.341 W	13,945,342.27	3,456,307.62
3,036.00	0.75	206.15	3,035.81	-12.58	-5.02	30° 0' 42.281 N	94° 17' 52.349 W	13,945,341.11	3,456,307.01
3,133.00	0.81	204.76	3,132.80	-13.77	-5.58	30° 0' 42.269 N	94° 17' 52.356 W	13,945,339.92	3,456,306.45
3,228.00	0.73	204.84	3,227.79	-14.93	-6.12	30° 0' 42.258 N	94° 17' 52.362 W	13,945,338.76	3,456,305.91
3,304.00	0.67	204.58	3,303.79	-15.78	-6.51	30° 0' 42.250 N	94° 17' 52.367 W	13,945,337.91	3,456,305.52
3,411.00	0.98	231.56	3,410.78	-16.91	-7.49	30° 0' 42.239 N	94° 17' 52.379 W	13,945,336.78	3,456,304.54
3,456.95	0.93	232.86	3,456.72	-17.38	-8.09	30° 0' 42.234 N	94° 17' 52.386 W	13,945,336.31	3,456,303.94
3,471.00	0.92	233.29	3,470.77	-17.52	-8.27	30° 0' 42.233 N	94° 17' 52.388 W	13,945,336.17	3,456,303.76
3,693.00	2.27	232.20	3,692.68	-21.28	-13.18	30° 0' 42.198 N	94° 17' 52.445 W	13,945,332.41	3,456,298.85
3,790.00	2.13	234.46	3,789.61	-23.51	-16.16	30° 0' 42.177 N	94° 17' 52.480 W	13,945,330.18	3,456,295.87
3,877.00	2.10	229.32	3,876.55	-25.48	-18.69	30° 0' 42.158 N	94° 17' 52.510 W	13,945,328.21	3,456,293.34
3,973.00	1.87	229.17	3,972.49	-27.66	-21.20	30° 0' 42.138 N	94° 17' 52.539 W	13,945,326.03	3,456,290.83

Design Report for Bead Farm #3 - 003 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
4,069.00	1.58	227.05	4,068.45	-29.58	-23.36	30° 0' 42.120 N	94° 17' 52.565 W	13,945,324.11	3,456,288.67
4,166.00	1.18	229.82	4,165.42	-31.14	-25.10	30° 0' 42.105 N	94° 17' 52.585 W	13,945,322.55	3,456,286.93
4,260.00	1.13	222.08	4,259.40	-32.45	-26.46	30° 0' 42.093 N	94° 17' 52.601 W	13,945,321.24	3,456,285.57
4,355.00	1.30	218.12	4,354.38	-33.99	-27.75	30° 0' 42.078 N	94° 17' 52.617 W	13,945,319.70	3,456,284.28
4,545.00	0.88	214.41	4,544.34	-36.89	-29.91	30° 0' 42.050 N	94° 17' 52.643 W	13,945,316.80	3,456,282.12
4,642.00	0.63	222.34	4,641.33	-37.90	-30.69	30° 0' 42.040 N	94° 17' 52.652 W	13,945,315.79	3,456,281.34
4,825.00	0.44	231.95	4,824.33	-39.08	-31.92	30° 0' 42.029 N	94° 17' 52.666 W	13,945,314.61	3,456,280.11
5,018.00	0.36	262.36	5,017.32	-39.61	-33.10	30° 0' 42.024 N	94° 17' 52.680 W	13,945,314.08	3,456,278.93
5,105.00	0.25	225.32	5,104.32	-39.78	-33.51	30° 0' 42.023 N	94° 17' 52.685 W	13,945,313.91	3,456,278.52
5,200.00	0.39	177.91	5,199.32	-40.25	-33.65	30° 0' 42.018 N	94° 17' 52.687 W	13,945,313.44	3,456,278.38
5,391.00	0.31	182.05	5,390.31	-41.42	-33.64	30° 0' 42.007 N	94° 17' 52.687 W	13,945,312.27	3,456,278.39
5,486.00	0.31	169.41	5,485.31	-41.93	-33.60	30° 0' 42.002 N	94° 17' 52.687 W	13,945,311.76	3,456,278.43
5,579.00	0.25	115.14	5,578.31	-42.26	-33.37	30° 0' 41.998 N	94° 17' 52.684 W	13,945,311.43	3,456,278.66
5,675.00	0.19	109.32	5,674.31	-42.40	-33.03	30° 0' 41.997 N	94° 17' 52.681 W	13,945,311.29	3,456,279.00
5,771.00	0.26	142.20	5,770.31	-42.63	-32.75	30° 0' 41.994 N	94° 17' 52.677 W	13,945,311.06	3,456,279.28
5,867.00	0.18	75.89	5,866.31	-42.76	-32.47	30° 0' 41.993 N	94° 17' 52.674 W	13,945,310.93	3,456,279.56
6,047.00	0.14	37.10	6,046.31	-42.52	-32.06	30° 0' 41.995 N	94° 17' 52.670 W	13,945,311.17	3,456,279.97
6,238.00	0.42	17.33	6,237.31	-41.66	-31.71	30° 0' 42.004 N	94° 17' 52.665 W	13,945,312.03	3,456,280.32
6,335.00	0.25	355.92	6,334.31	-41.11	-31.62	30° 0' 42.009 N	94° 17' 52.664 W	13,945,312.58	3,456,280.41
6,430.00	0.25	355.77	6,429.30	-40.70	-31.65	30° 0' 42.013 N	94° 17' 52.664 W	13,945,312.99	3,456,280.38
6,525.00	0.26	299.85	6,524.30	-40.39	-31.85	30° 0' 42.016 N	94° 17' 52.666 W	13,945,313.30	3,456,280.18
6,619.00	0.25	289.02	6,618.30	-40.21	-32.23	30° 0' 42.018 N	94° 17' 52.671 W	13,945,313.48	3,456,279.80
6,809.00	0.40	280.55	6,808.30	-39.96	-33.28	30° 0' 42.021 N	94° 17' 52.682 W	13,945,313.73	3,456,278.75
6,998.00	0.28	240.88	6,997.30	-40.06	-34.33	30° 0' 42.020 N	94° 17' 52.694 W	13,945,313.63	3,456,277.70
7,185.00	0.18	170.15	7,184.30	-40.57	-34.68	30° 0' 42.016 N	94° 17' 52.698 W	13,945,313.12	3,456,277.35
7,282.00	0.25	146.16	7,281.29	-40.90	-34.53	30° 0' 42.012 N	94° 17' 52.697 W	13,945,312.79	3,456,277.50
7,374.00	0.13	148.56	7,373.29	-41.15	-34.37	30° 0' 42.010 N	94° 17' 52.695 W	13,945,312.54	3,456,277.66
7,471.00	0.26	192.80	7,470.29	-41.46	-34.36	30° 0' 42.007 N	94° 17' 52.695 W	13,945,312.23	3,456,277.67
7,563.00	0.38	181.88	7,562.29	-41.97	-34.42	30° 0' 42.002 N	94° 17' 52.696 W	13,945,311.72	3,456,277.61
7,658.00	0.19	175.36	7,657.29	-42.44	-34.41	30° 0' 41.997 N	94° 17' 52.696 W	13,945,311.25	3,456,277.62
7,754.00	0.13	208.60	7,753.29	-42.70	-34.45	30° 0' 41.994 N	94° 17' 52.697 W	13,945,310.99	3,456,277.58
7,850.00	0.53	265.40	7,849.29	-42.83	-34.95	30° 0' 41.993 N	94° 17' 52.703 W	13,945,310.86	3,456,277.08
7,949.00	0.75	264.57	7,948.28	-42.93	-36.05	30° 0' 41.993 N	94° 17' 52.715 W	13,945,310.76	3,456,275.98
8,135.00	0.62	255.66	8,134.27	-43.29	-38.24	30° 0' 41.990 N	94° 17' 52.740 W	13,945,310.40	3,456,273.79
8,321.00	0.38	253.90	8,320.26	-43.71	-39.80	30° 0' 41.987 N	94° 17' 52.758 W	13,945,309.98	3,456,272.23
8,416.00	0.19	261.71	8,415.26	-43.82	-40.26	30° 0' 41.986 N	94° 17' 52.763 W	13,945,309.87	3,456,271.77
8,497.00	0.32	247.32	8,496.26	-43.93	-40.60	30° 0' 41.985 N	94° 17' 52.767 W	13,945,309.76	3,456,271.43
8,565.00	0.32	247.32	8,564.26	-44.08	-40.95	30° 0' 41.983 N	94° 17' 52.771 W	13,945,309.61	3,456,271.08

Design Report for Bead Farm #3 - 003 ST00BP00

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,565.00	8,564.26	-44.08	-40.95	Proj. to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
317.00	2,132.00	01 HAL MWD (MagVarMS) 17 1/2" Hole 317' - 2132'	3_MWD+HRGM+MS
2,181.00	8,497.00	02 HAL MWD (MagVarMS) 12 1/4" Hole 2181' - 8497'	3_MWD+HRGM+MS

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
152.50	152.50	20" Conductor Casing	20	20
2,155.00	2,154.92	13-3/8" Surface Casing	13-3/8	17-1/2
8,548.48	8,547.74	9-5/8" Production Casing	9-5/8	12-1/4

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated

Design Report for Bead Farm #3 - 003 ST00BP00

Directional Difficulty Index

Average Dogleg over Survey:	0.19 °/100usft	Maximum Dogleg over Survey:	0.77 °/100usft at 1,720.00 usft
Net Tortousity applicable to Plans:	0.19 °/100usft	Directional Difficulty Index:	3.170

Audit Info

North Reference Sheet for Rose Prospect CCS - Bead Farm #3 - 003 ST00BP00

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 59.52usft (Plan). Northing and Easting are relative to Bead Farm #3

Coordinate System is US State Plane 1983, Texas South Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 1,968,500.00usft, False Northing: 13,123,333.33usft, Scale Reduction: 0.99993284

Grid Coordinates of Well: 13,945,353.69 usft N, 3,456,312.03 usft E

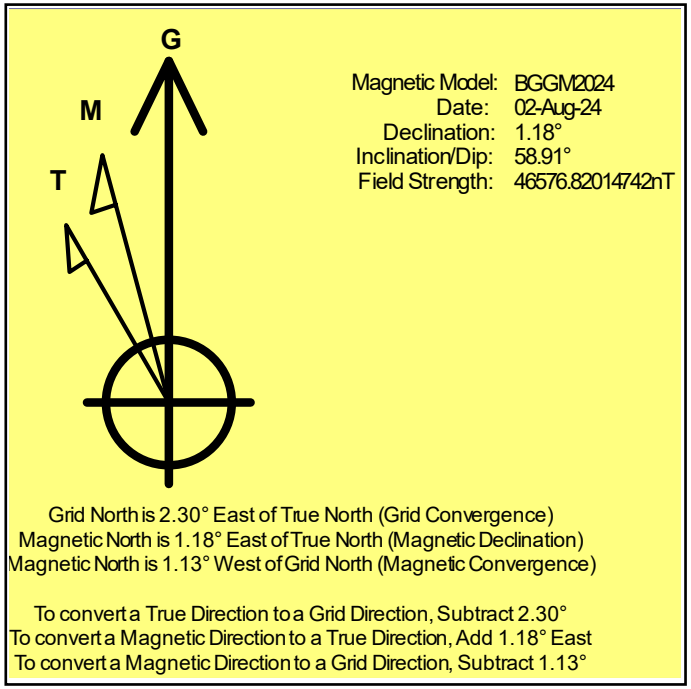
Geographical Coordinates of Well: 30° 00' 42.40" N, 094° 17' 52.29" W

Grid Convergence at Surface is: 2.30°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,565.00usft

the Bottom Hole Displacement is 60.17usft in the Direction of 222.90° (Grid).

Magnetic Convergence at surface is: 1.13° (2 August 2024, , BGGM2024)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

*NOTIFICATION

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
898450	Apr 17, 2024	* 03
API NUMBER	**FORM W-1 RECEIVED**	**COUNTY**
42-245-32912	Mar 27, 2024	JEFFERSON
TYPE OF OPERATION	**WELLBORE PROFILE(S)**	**ACRES**
NEW DRILL	Vertical	650

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE

This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.

District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM	3
LOCATION	**TOTAL DEPTH**
3.35 miles SE direction from CHINA	10000

Section, Block and/or Survey

SECTION 8 BLOCK ABSTRACT 658

SURVEY HT&B RR CO/TURNER, D C

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1742 ft. WEST 2937 ft. NORTH	ft.
DISTANCE TO LEASE LINES	**DISTANCE TO NEAREST WELL ON LEASE**
1742 ft. WEST 2937 ft. NORTH	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	650.00	8,600	3	03
BEAD FARM			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

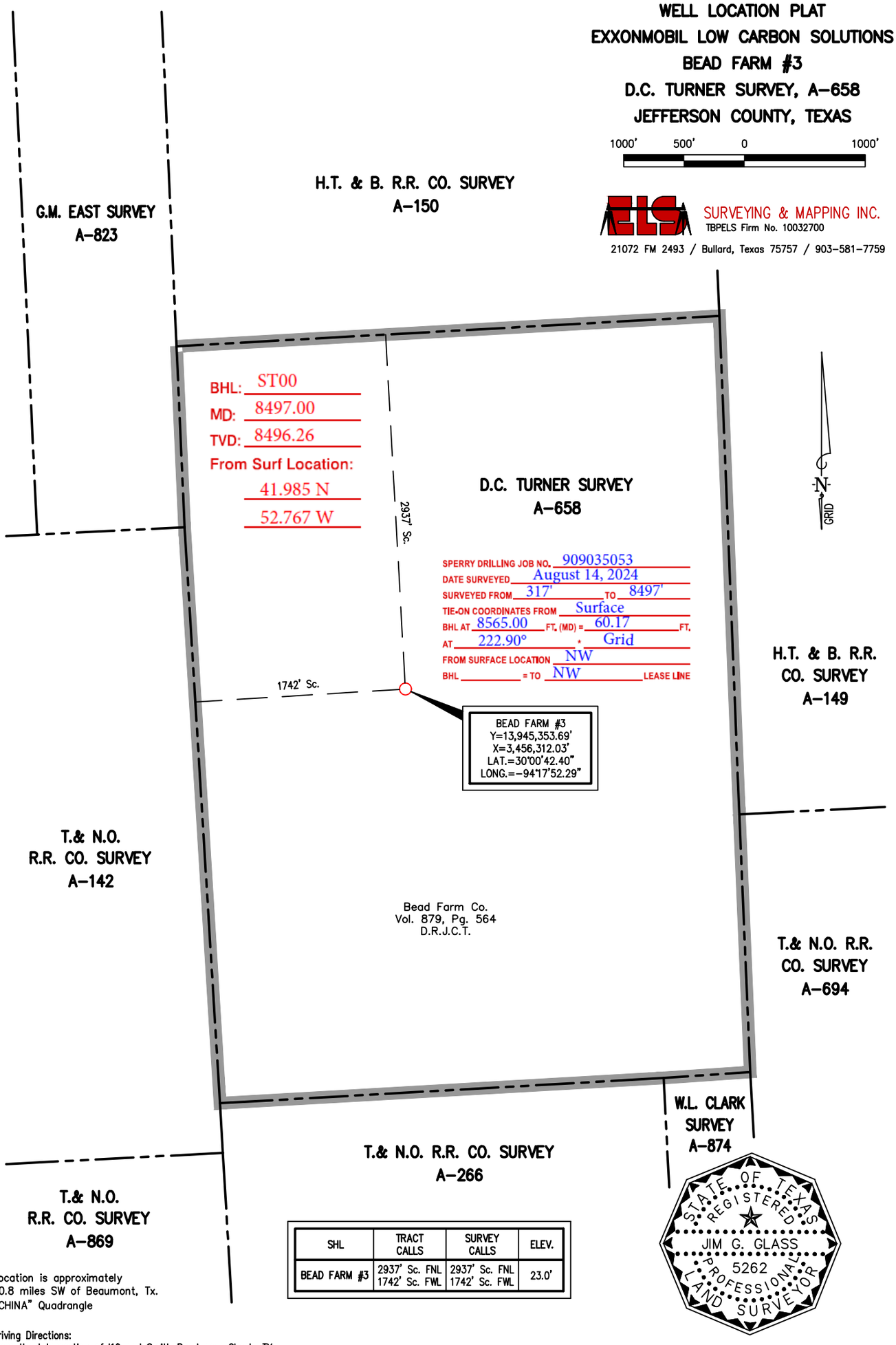
The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
BEAD FARM #3
D.C. TURNER SURVEY, A-658
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759



SHL	TRACT CALLS	SURVEY CALLS	ELEV.
BEAD FARM #3	2937' Sc. FNL 1742' Sc. FWL	2937' Sc. FNL 1742' Sc. FWL	23.0'

Location is approximately 10.8 miles SW of Beaumont, Tx. "CHINA" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 2.8 miles turn right (North) on Green Pond Gully Road Go 0.8 miles. Turn Left (Northwest). Drive on location.

DATE SURVEYED: 8/23/2023-8/28/2023

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data and tract acreages shown hereon were furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

STATE OF TEXAS REGISTERED JIM G. GLASS 5262 PROFESSIONAL LAND SURVEYOR

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS - - - COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: April 9, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: ECJ FB 2744/88-97 Job No. 430923 Map No. J-0923-LOC-INJ3C

CONFIDENTIAL BUSINESS INFORMATION

CHRISTI CRADDICK, CHAIRMAN
WAYNE CHRISTIAN, COMMISSIONER
JIM WRIGHT, COMMISSIONER



DANNY SORRELLS
DIRECTOR, OIL AND GAS DIVISION

PETER FISHER, P.G.
DISTRICT DIRECTOR

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

OPERATOR Name:	EXXONMOBIL LOW C SOL ON	**RE:**	**Lease:**	Bead Farm Co.
Address1:	ATTN EDWARD E GRAHAM W1.2B.02			
Address2:	22777 SPRINGWOODS VILLAGE PKWY	**Well No:**	3	
City:	SPRING	**Sec:**	8	**Block:**
State:	TX	**County:**	JEFFERSON	
		Survey Name:	HT&B RR CO/TURNER, D C	

SWR13EX Application Number: 130364 **Drilling Permit No:**

SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for **LEASE** Bead Farm Co. ;
WELL 3 has been approved by the Railroad Commission of Texas District Office.

a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.

b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.

c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.

d. The casing and cement program shall adhere to the following specifications:

Set 2170 feet of surface casing and circulate cement from the shoe to the ground surface.

DP 898450 - Exxonmobil, Bead Farm Co. Lease Well 3 (245 32912)

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

CONFIDENTIAL BUSINESS INFORMATION

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted 05/20/2024 .
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: AUDREY KUKLENZ DATE: 05/20/2024

PETER FISHER, P.G.

DISTRICT DIRECTOR

Appendix D.2: Coring and Logging Plan for Stratigraphic Well Bead Farm Co. #1

Claimed as PBI

Claimed as PBI

Claimed as PBI

Claimed as PBI

Claimed as PBI

Claimed as PBI

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Claimed as PBI

Appendix D.3: Stimulation Program

Rose CCS Project Stimulation Plan

1. Facility Information 1
2. Introduction and Purpose 1
2.1. Purpose of the Stimulation 2
3. Stimulation Fluids 2
3.1. Additives 3
3.2. Diverters 3
4. Mechanical Stimulation 3
5. Ensuring Containment 3
6. Stimulation Procedures 4

1. Facility Information

Facility name: ROSE CCS PROJECT
INJECTION WELL NOS. 1 - 3

Well locations: JEFFERSON COUNTY, TX

Stimulation to enhance the injectivity potential of the injection zone may be necessary. Stimulation may involve but is not limited to flowing fluids into or out of the well, increasing or connecting pore spaces in the injection formation, or other activities that are intended to allow the injectate to move more readily into the injection formation. Advance notice of all proposed stimulation activities must be provided to the Director, as detailed below, prior to conducting the stimulation. The permittee must describe any fluids to be utilized for stimulation activities and the permittee must demonstrate that the stimulation will not interfere with containment. The permittee must submit proposed procedures for all stimulation activities to the Director in writing at least 30 days in advance, per 40 CFR 146.91(d)(2). Within the 30-day notice period, EPA may: deny the stimulation; approve the stimulation as proposed; or approve the stimulation with conditions. The permittee must carry out the stimulation procedures, including any conditions, as approved or set forth by EPA.

2. Introduction and Purpose

ExxonMobil may stimulate the injection zones for the Rose CCS Project to enhance the injectivity potential of CO2 injection wells. Stimulation may involve, but is not limited to, flowing fluids into or out of the well, increasing or connecting pore spaces in the injection formation, or other activities that are intended to allow CO2 to move more readily into the injection zone.

ExxonMobil will adhere to all applicable regulatory requirements for any stimulation treatment that may be required. Specifically, and without limitation, ExxonMobil will comply with the following:

- 40 CFR 146.82(a)(9): ExxonMobil will submit the proposed stimulation program, a description of stimulation fluids to be used and a determination that stimulation will not interfere with containment.
- 40 CFR 146.88(a): Except during stimulation, ExxonMobil will ensure that injection pressure does not exceed 90 percent of the fracture pressure of the injection zone(s) so as to ensure that the injection does not initiate new fractures or propagate existing fractures in the injection zones(s). In no case will injection pressure initiate fractures in the confining zones(s) or cause movement of injection or formation fluids that endanger USDW.
- 40 CFR 146.9l(d)(2) and (e): ExxonMobil will notify the Director in writing 30 days in advance of any planned stimulation activities, other than stimulation for formation testing conducted under 40 CFR 146.82. Regardless of whether a state has primary enforcement responsibility, ExxonMobil shall submit all required reports, submittals, and notifications under subpart h of this part to EPA in an electronic format approved by EPA.

The information provided in this section specifically addresses the stimulation fluids, additives, and proposed stimulation procedures ExxonMobil may implement. This plan includes multiple stimulation methodologies that may be selected based on site-specific technical and operational conditions that may impact future well performance. The methods provided below may also be used to remediate scaling or perforation occlusion in the well.

2.1. Purpose of the Stimulation

Perforated intervals in the proposed injection zones may require stimulation periodically throughout the project life to enhance performance with the aim of restoring it to initial or optimum conditions. For example, stimulation may be needed to remediate injectivity loss resulting from mineral scales, clay fragments, metallic sulfide, or oxide particulates. Stimulation may also be necessary to remove any near-wellbore damage resulting from drilling and completion operations. Following well construction, remedial stimulation may be conducted before the commencement of CO2 injection..

3. Stimulation Fluids

ExxonMobil will use acid blends for matrix stimulation that are typical for the industry. These include, but are not limited to, mixtures of acetic, hydrochloric, hydrofluoric, and/or other organic acids. These blends have been historically proven to remove near-wellbore damage caused by mineral scales, drilling muds, completion fluids, and clay fines while minimizing negative impacts

to permeability. There is also potential for near-wellbore halite precipitation in the CO2 injectors, which may require remediation by periodic flushes with less saline water.

All chemical treatments will be evaluated and selected for compatibility with the treatment method. For example, mineral acids will be treated with chemical inhibitors to prevent corrosion damage to the tubing string. In addition, chemical systems will be evaluated and selected to avoid damage to the downhole packer sealing elements, casing, and other seals within the injection system that might be exposed to the chemicals.

3.1. Additives

Additives may be utilized with the stimulation fluids to aid matrix stimulation while mitigating corrosion of tubulars and potential damage to the sequestration zone. These additives include, but are not limited to, corrosion or acid inhibitors, scale inhibitors, clay stabilizers, biocides, emulsifiers, chelating agents, mutual solvents, iron sequestrants, retarders, and/or surfactants. Compatibility of these additives with the stimulation fluids, tubulars and the reservoir will be confirmed prior to their use in any stimulation activities

3.2. Diverters

Nitrogen, crosslink polymers, viscoelastic surfactants, solid particulates and/or fiber diverters may be added to stimulation fluids to achieve improved diversion and effective treatment for the target zone by diverting the stimulation fluids to the most impaired (i.e., low injectivity) perforations. Depending on the well-specific requirements and stimulation design, organic or polymeric diverting agents may also be selected. These diverters provide temporary restrictions during stimulation operations and degrade or break-down with time due to water solubility and temperature. The most suitable diverting agent will be selected based on one or more factors, including, anticipated pump rates, the length of the perforated interval, perforation density, and the selected technique for conveying acid to the injection zone (e.g., pumping through regular tubing or pumping down coiled tubing).

4. Mechanical Stimulation

In addition to chemical stimulation, mechanical stimulation of the well may be required independently, or in conjunction with chemical stimulation. Mechanical stimulation may be required if there is deposition that cannot be easily remediated with chemicals, or if mechanical means may be more effective. These mechanical options include, but are not limited to, backflow, adding perforations, or re-perforating. Perforating operations may be further enhanced with the use of propellants. Propellant stimulations will be designed for nominal height growth, and to remain within the injection zone and avoid fracture growth into the confining layer.

5. Ensuring Containment

Except during stimulation, injection pressure will not exceed 90% of the established fracture pressure for the injection zone. Injection pressure at the downhole tubing pressure gauge and tubing/annulus surface gauges will be continuously monitored during the stimulation operation. Stimulation of the injection interval will be conducted to avoid affecting the confining layers. .

6. Stimulation Procedures

A standard stimulation procedure is outlined below. This procedure may be modified depending on site-specific operational and technical conditions and the specific treatment requirements. The conveyance methods may include coil tubing, tubing-conveyed retrievable straddle packer assembly, snubbing unit, tubing flush, or bullheading.

1. Determine compatibility of stimulation chemicals with well materials, reservoir rock, and fluids.
2. Develop stimulation plan based on the injection impairment cause
3. Provide work procedure and stimulation program to the UIC Program Director in writing at least 30-days prior to the planned date for start of the work (40 CFR 146.91(d)(2)).
4. Prepare wellsite and mobilize equipment
5. Shut-in and isolate the well from the CO2 injection system. Allow the pressures to stabilize
8. Rig up the stimulation equipment.
9. Prepare the well for stimulation.
10. Perform the stimulation treatment as per approved plan.
11. Flush the wellbore with treated water and prepare the well to return to normal operation
12. Rig down and return the well back to injection

Appendix D.4: Material Selection

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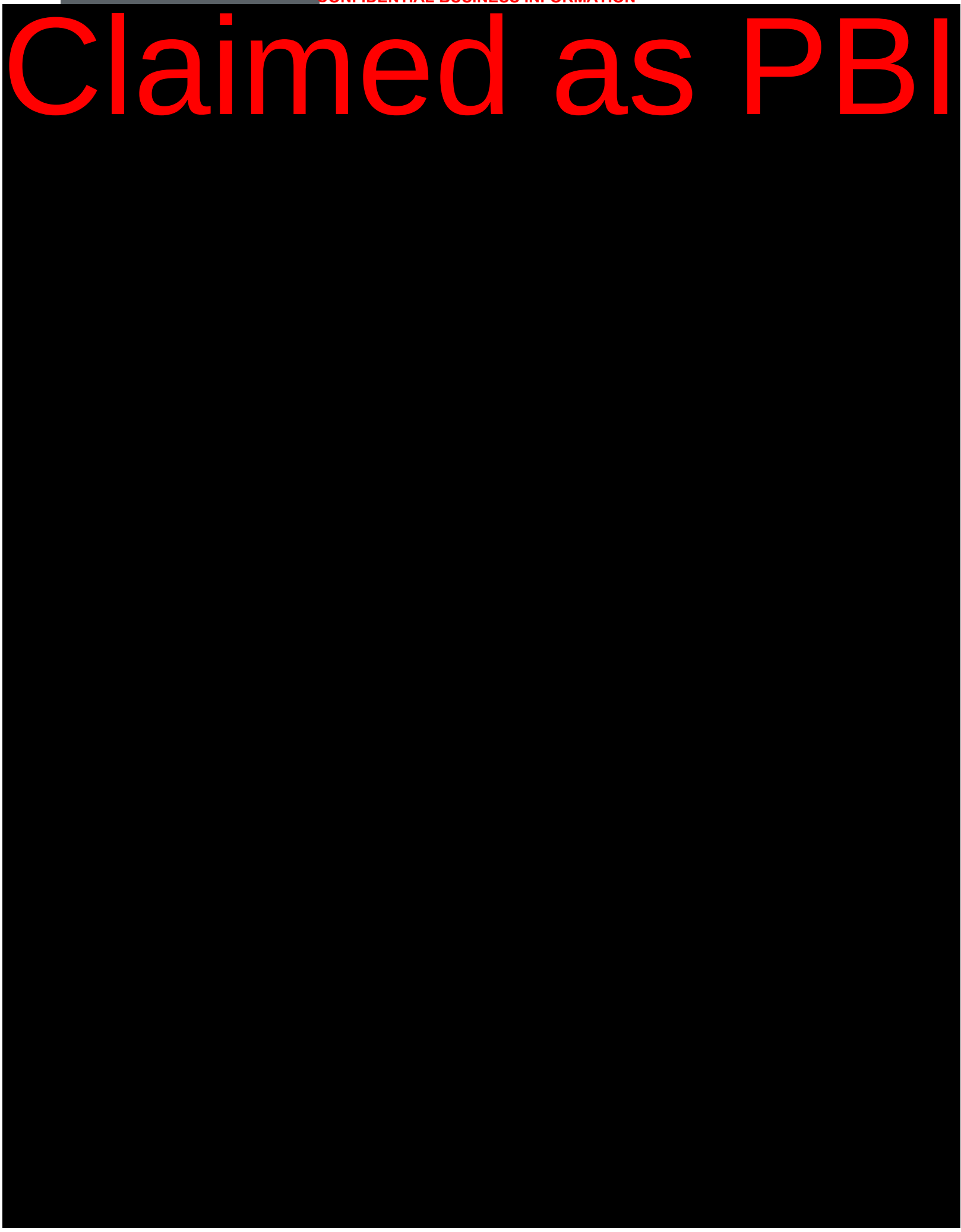
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Claimed as PBI

Underground Injection Control – Class VI Permit Application for Rose CCS Project Injection Wells No. 01, No. 02, and No. 03

APPENDIX E – QUALITY ASSURANCE SURVEILLANCE PLAN

Rose Carbon Capture and Storage Project

Jefferson County, Texas

ExxonMobil Low Carbon Solutions Onshore Storage, LLC

May 2025

APPENDIX E – QUALITY ASSURANCE SURVEILLANCE PLAN

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List of Acronyms and Abbreviations

Name	Definition
°C	degrees Celsius
AoR	Area of Review
CFR	Code of Federal Regulations
CO2	carbon dioxide
COC	Chain-of-Custody
EPA	U.S. Environmental Protection Agency
mg	Milligram
OCC	Operations Control Center

Name	Definition
Project	Rose Carbon Capture and Storage Project
QA	quality assurance
QASP	Quality Assurance and Surveillance Plan
QC	quality control
UIC	Underground Injection Control
USDW	Underground Sources of Drinking Water

Distribution Sheet

This Quality Assurance and Surveillance Plan was prepared and approved by ExxonMobil for use in collecting information for the operation and compliance of the Rose Carbon Capture and Storage Project. ExxonMobil will incorporate the quality assurance and surveillance actions described in this document into the standard ExxonMobil operating program, as appropriate, for the control of work associated with the scope of data quality and detection monitoring for the Project.

Revision History for QASP.

Version	Date	Description of Change
Version 1.0	August 30, 2024	Initial submission for the Class VI UIC Permit Application for the Project
Version 2.0	February 7, 2025	Updated based on modifications of the Testing and Monitoring Plan
Version 3.0	March 21, 2025	Updated based on clarification responses to EPA's RAI.
Version 4.0	May 08, 2025	Updated based on clarification responses to EPA's RAI #2

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E.1 Introduction

ExxonMobil Low Carbon Solutions Onshore Storage LLC submitted a Class VI Underground Injection Control (UIC) permit application for the Rose Carbon Capture and Storage Project (Project) in March 2024. The Project is in Jefferson County, Texas, and proposes to inject approximately 53 million metric tonnes of carbon dioxide (CO2) into the Fleming and Upper Frio Formations for geological storage of CO2 using three injection wells over a 13-year period. Figure E-1 provides the location of the Project in Jefferson County, Texas as well as the layout of the Project and the key features within and near the Area of Review.

Section 5 – Testing and Monitoring Plan of the permit application was developed for collecting data for tracking the CO2 plume and brine pressure front within the Area of Review. The Testing and Monitoring Plan provided the strategy and details of the data collection program in compliance with the requirements of the Code of Federal Regulations, Title 40, Section 146.90 [40 CFR 146.90]. The Quality Assurance and Surveillance Plan (QASP) is required pursuant to 40 CFR 146.90(k) for the purpose of establishing data collection objectives and procedures related to data quality and consistency throughout the lifecycle of the Project: the pre-operational, the injection operation phase; and the post-injection site closure phase. Some data collection activities were also referenced in Section 4 – Well Construction Plan and Operating Conditions and the Section 7 – Post-Injection Site Care and Site Closure Plan. The QASP also established data quality protocols for these sections of the permit application.

E.2 Scope and Objective for QASP

The scope of the QASP is based on the Testing and Monitoring Plan data collection activities for injectate monitoring; corrosion monitoring of the well's tubular, mechanical, and cement components; pressure fall-off testing; groundwater quality monitoring; and CO2 plume and pressure front tracking. The objective of the QASP is to provide standard procedures and practices that will be employed for collecting information and data related to the scope of activities. Quality assurance objectives were established for data management, sample collection and laboratory analysis, and reporting results as appropriate for on-going monitoring for the Project.

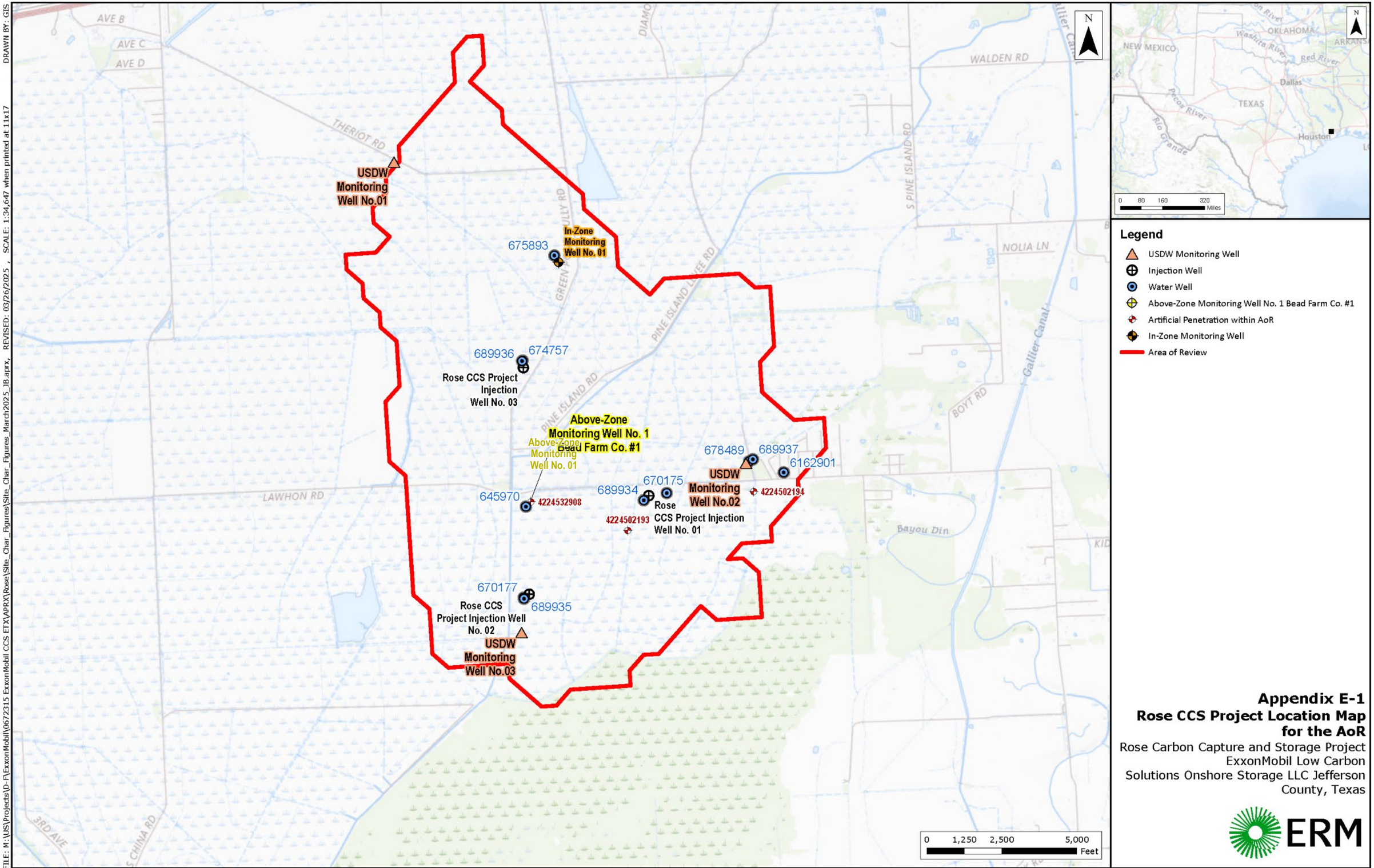
E.3 Overview of ExxonMobil's Operations Control System

The Project will be operated remotely by ExxonMobil's Operations Control Center (OCC). Operating philosophies have been developed which will be incorporated into Operating Instructions for OCC operators. The OCC is also stewarded by a robust Control Room Management Program per 49 CFR 195. OCC Operators operate and monitor the facility through a Supervisory Control and Data Acquisition system. Additionally, Field Operations will make periodic visits to perform surveillance, maintenance and integrity objectives.

In alignment with the requirements for the QASP, the following testing and monitoring activities will be included in the operations control program:

- Mechanical integrity test methods
- Continuous recording of operational parameters during injection
- Corrosion monitoring
- Pressure fall-off testing

- Monitoring of CO2 stream
- CO2 plume and pressure front tracking
  - Direct pressure front tracking
  - Plume and pressure front tracking using indirect geophysical techniques
- CO2 plume tracking using groundwater monitoring data
  - USDW monitoring well
  - Above-zone monitoring well



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Source: Esri - World Topographic Map; NAD 1983 StatePlane Texas South FIPS 4205 Feet

Appendix E-1
Rose CCS Project Location Map for the AoR
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC Jefferson County, Texas

ERM

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An appropriate organizational structure, roles and responsibility matrix, and communications plan will be developed as part of the operations control plan for the Project that complies with the requirements of the Class VI UIC permit, in coordination with the UIC Program Director review and approval of the QASP.

E.4 Alignment of Testing and Monitoring Plan with QASP

The QASP identifies a comprehensive list of quality assurance procedures that align with the data collection and testing requirements identified in the Testing and Monitoring Plan. Table E-1 provides a summary of each test and monitoring activity in the Testing and Monitoring Plan and the associated feature described in the QASP including source of the data or measurement, the method of data acquisition, and the use of third-party laboratory for analysis, as appropriate.

Many of the measurements rely upon the use of field instrumentation. Table E-2 summarizes a list of the instruments planned for use and the data acquisition objectives for each instrument.

The indirect monitoring technique for tracking the CO2 plume and pressure front is a surface seismic monitoring via surface seismic sources and receivers near injectors. As outlined in Section 5 – Testing and Monitoring Plan, a series of seismic events are planned to acquire seismic data for analysis. The seismic events will be conducted by a qualified third-party contractor and the acquired seismic data will be provided to ExxonMobil with data quality qualifiers provided by the contractor, should uncertainty be apparent in the data.

E.5 Criteria for Data Evaluation

Groundwater monitoring and sampling is subject to potential sources of variability, such as:

- Natural heterogeneity in fluid geochemical composition, total dissolved solids, and formation pressure and temperature;
- Instrument variability due to calibration and drift during sampling or analytical activity;
- Alternating staff / accredited labs responsible for collecting/analyzing samples;
- Changes in environmental conditions during field sampling activities including temperature, rainfall, dust, nearby agricultural activities; and
- Typographic errors related to data input.

The following criteria are provided to help identify instances when variability has been introduced during the sampling and analysis phase and is not related to actual changes in groundwater quality conditions. These criteria and/or others will be considered when evaluating the data usability for data qualification (if warranted), reporting data quality, and decision-making purposes.

E.5.1 Precision

Precision for physical and analytical measurement parameters is detailed within the individual laboratory's test methodology and within established detection limits. Laboratory equipment calibration and maintenance are described by the individual laboratory in a typical analytical quality assurance manual or equivalent. Following laboratory selection, the laboratory's analytical quality assurance manual can be provided upon request. Laboratory assessment of analytical precision will be the responsibility of the individual laboratories per their standard operating procedures and the analytical methods being used.

E.5.2 Bias

An assessment of bias is applicable to laboratory analyses where a difference between the reference value and the average of measurements made on the same sample can be quantitatively measured. The potential for bias is not applicable in direct measurements including logging, temperature, and pressure. Evaluation of analytical bias will be the responsibility of the individual laboratories per their analytical quality assurance manual or equivalent. Analytical results received from individual laboratories will be reviewed to evaluate potential for analytical bias.

Table E-1: Summary of Testing and Monitoring Plan

Measurement	Purpose	Location(s)	Project Phase & Frequency			Descriptive Features in QASP		
			Pre-Injection	Operation	Post-Injection Site Care	Data Source Type	Method of Data Acquisition	Lab/Custody Procedures
Carbon Dioxide Stream Analysis	CO2 stream composition	Central Pad	Baseline	Quarterly	NA	One sample per quarter	Chemical Analysis	Accredited laboratory receiving samples under chain-of-custody
Carbon Dioxide Stream Temperature	Monitor injection temperature	Central Pad	Baseline	Continuous	NA	Coriolis meter/wellhead pressure logger	Direct Measurement	None
Injection Rate, Density, and Mass	Rate and volume monitoring	Central Pad	NA	Continuous	NA	Coriolis meter	Direct Measurement	None
Injection Pressure	Compliance with operating permit	Surface, injection well piping	NA	Continuous	NA	Pressure gauge at central injection pad	Direct Measurement	None
Annular Pressure	Pressure monitoring and well integrity	Injection Wells	NA	Continuous	NA	Pressure gauge	Direct Measurement	None
Corrosion Monitoring	Well Integrity	Central Pad downstream of metering skid	NA	Quarterly	NA	Corrosion coupon	Physical Analysis	Accredited laboratory receiving samples under chain-of-custody
Internal Mechanical Integrity – Injection Tubing	Well Integrity	Injection Wells No. 01, No. 02, and No. 03	Baseline	Continuous	Prior to P&A	Tubing annulus pressure measured at surface of wellhead	Direct Measurement	None
External Mechanical Integrity	Well Integrity	Injection Wells No. 01, No. 02, and No. 03	Baseline	Continuous Annual (surveys)	Prior to P&A	DTS Temperature surveys Pulse Neutron Log in OA mode	Direct Measurement	None
Containment and Control	Assess CO2 plume and brine pressure front Containment below UCCZ	USDW Monitoring Wells No. 01, No. 02, No. 03 Above-Zone Monitoring Well No. 01 (Bead Farm Co. #1)	Baseline	Quarterly	Annual	One sample per well	Direct Measurement	Accredited laboratory receiving samples under chain-of-custody
Direct CO2 Plume/Pressure Front Tracking	Demonstrate compliance with permit and calibrate plume model	Injection Wells No. 01, No. 02, and No. 03 In-Zone Monitoring Well No. 01	Baseline	Continuous	Continuous for In-Zone Monitoring Well No. 01	Downhole tubing- mounted pressure and temperature gauge Downhole casing mounted pressure and temperature gauge	Direct Measurement	None
Indirect CO2 Plume/Pressure Front Tracking	Demonstrate compliance with permit and calibrate plume model	Timelapse seismic surveys	Baseline	Two Survey Events	One Survey Event	Surface seismic monitoring	Indirect Measurement	None
Indirect CO2 Plume/Pressure Front Tracking	Demonstrate compliance with permit and calibrate plume model	Surface Seismic sources and receivers near injectors within AoR	Continuous	Continuous	Continuous	Surface passive seismicity monitoring	Continuous	None

Measurement	Purpose	Location(s)	Project Phase & Frequency			Descriptive Features in QASP		
			Pre-Injection	Operation	Post-Injection Site Care	Data Source Type	Method of Data Acquisition	Lab/Custody Procedures
Pressure Fall-Off Testing	Assess injection well performance and formation permeability	Injection Wells No. 01, No. 02, and No. 03	NA	At end of each injection stage	None	Downhole tubing mounted pressure and temperature gauge	Direct Measurement	None
DTS = distributed temperature sensing; NA= not applicable; OA = Wireline deployed oxygen activation (OA) log; P&A = plug and abandon; UCCZ = upper composite confining zone; AoR = Area of Review								

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Table E-2: Summary of Field Instrumentation

Monitoring Location	Instrument Type	Compliance Objective
Central pad before distribution system	Pressure and temperature gauge	Monitor the pressure and temperature of the CO2 liquid at the point of intake prior to distribution.
	Coriolis meter	Measure the mass flow rate of CO2 liquid at the point of intake prior to distribution.
	Corrosion coupons	Measure corrosion rates for well completion materials downstream of metering skid.
Injection Wells No. 01, No. 02, and No. 03	Downhole mounted pressure/temperature gauge	Measure pressure and temperature in the four injection intervals during operation and prior to injection stage changes.
	Annular pressure testing	Measure tubing casing pressure to assess internal mechanical integrity.
	Fiber optic cable for DTS measurements	Measure temperature in the injection zone and above the injection zone to assess the potential for loss of containment.
	Downhole tubing mounted pressure and temperature gauge	Measure temperature and pressure inside tubing above packer for CO2 plume and pressure front tracking.
	Wellhead pressure gauge	Measure pressure inside the tubing at the wellhead prior to injection.
	Coriolis Meter	Measure the mass of CO2 fluid at each injection well pad prior to injection tubing.
USDW Monitoring Wells No. 01, No. 02, No. 03	Portable field meters for measuring groundwater stabilization parameters such as specific conductance, temperature, dissolved oxygen, turbidity, and pH	Measure field parameters prior to collecting groundwater samples to assess stabilization of groundwater conditions in screened interval prior to sample collection.
In-Zone Monitoring Well No. 01	Tubing encapsulated conductor cable with in-line pressure/ temperature gauges	Measure temperature and pressure in the four injection intervals and the first water-bearing zone above the UCCZ for CO2 plume and pressure front tracking.

Monitoring Location	Instrument Type	Compliance Objective
	DTS Interrogator and fiber cables	Measure temperature from the top of the UCCZ to the bottom of the injection interval.
Above-Zone Monitoring Well No. 01 (Bead Farm Co. #1)	Portable field meters for measuring groundwater stabilization parameters such as specific conductance, temperature, dissolved oxygen, turbidity, and pH	Detection monitoring for presence of CO2 and brine in the first water-bearing zone above the UCCZ.
DTS = distributed temperature sensing; UCCZ = upper composite confining zone		

E.5.3 Representativeness

Representativeness is the degree to which data expresses a characteristic of a population, parameter variation at a point, or an environmental condition. Representativeness for analytical results of groundwater samples will be estimated by ion and mass balances. Ion balances with ±10% error or less will be considered valid. Mass balance assessment will be used in cases where the ion balance is greater than ±10% to help assess the source of error. For a sample and its duplicate, if the relative percent difference is greater than 10%, the sample may be considered non-representative.

To assess sample representativeness, sample collection will be performed in accordance with procedures recommended by the U.S. Environmental Protection Agency (EPA) for collection and preservation and EPA-recommended holding times specified within a given method.

E.5.4 Completeness

Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected under normal conditions. It is expected that the designated analytical laboratory will provide data meeting the quality control (QC) acceptance criteria for 90 percent or more for the samples tested. In addition to the laboratory internal quality assurance (QA) / QC processes, the sampling contractor will evaluate the data validation and whether samples meet the QC acceptance criteria. For direct pressure and temperature measurements, it is expected that data will be recorded no less than 90% of the time.

E.5.5 Comparability

Data comparability is defined as the degree of confidence with which one data set may be compared to another. The groundwater samples will be comparable if collection, compositing, splitting, and testing methods are the same and the measurement units are the same. Comparability for field measurements will be achieved if the test procedures and measurement units within each group of tests are the same (e.g., pH, conductivity, temperature). Operating procedures will be followed to assure comparability including those specified in published EPA guidance documents.

E.6 Standards for Calibration of Instrument and Equipment

The following standards for operation and care of field instruments and equipment are planned in support of quality assurance. Both field equipment and laboratory instruments will be calibrated in accordance with the manufacturer guidelines. Permanent data loggers will be calibrated prior to or during the installation process and then checked for precision and accuracy in accordance with the manufacturer's guidelines. Calibration of field instruments will consist of the measurement of instrument response to standards of known composition and concentration and may include the preparation of a standard response curve for the compound or parameter at different concentrations.

Portable field instruments will be maintained in accordance with the procedures and schedule prescribed by the manufacturer to enable the collection of precise and accurate data. Field instruments and equipment will be acquired, inspected, and accepted for the field activity. Inspections will be conducted prior to use in accordance with the operational manuals.

E.7 Data Management System and Acquisition

Data, in the form of measurements and information about the performance of the injection system, will be collected electronically or manually and stored in an electronic data management system. This system will be aligned with the compliance requirements of the Class VI UIC permit. The electronic data collection systems are envisioned to be a part of the operational management program for the Project. Manual data collection activities, such as ground water monitoring, will be documented in either written or electronic data entry forms. The types of information collected include time and date of activity, person(s) performing activity, location(s), equipment, calibration data, and field parameter values.

Overall Project data quality will be managed through a system of review extending from field and laboratory through the data reduction and reporting process. ExxonMobil will perform a quality assurance review of the data entered the data management system. Data acquired from the injection system may be uploaded directly into the data management system. Analytical results for CO2 gas composition and groundwater will be obtained from the laboratory using an electronic data deliverables. ExxonMobil will utilize its internal data management system for archiving project documentation, data security, and backup.

The following discussion presents the data acquisition plans for each major recording.

E.7.1 Acquisition of Well Completion Data

ExxonMobil employs a third-party contractor to conduct a series of tests on completed wells using downhole tools. The data obtained from these tools is used to assess the alignment of the actual well completion with the well design. Table E-3 provides a summary of representative logging tools and the anticipated data to be obtained from these tools. The quality assurance process is provided as part of the services of the third-party contractor. ExxonMobil reviews the provided test results and associated data quality reports to identify whether the data are fit for purpose.

Table E-3: Representative Logging Tool Specifications

Parameter	Logging Speed	Vertical Resolution	Acquired Data	Temp. Rating	Pressure Rating
Ultrasonic Casing/ Cement Inspection	400 to 4,500 ft/hr	0.3 to 6.0 in	Image of casing and cement throughout well completion	350 °F	20,000 psi
Electromagnetic	600 to 900 ft/hr	Tubular Defect Location and Resolution: • First Tubular: 1 ft • Second Tubular: 2 ft • Third Tubular: 3 ft • Fourth Tubular: 4 ft • Fifth Tubular: 4 ft	Electromagnetic log of casing thickness	350 °F	15,000 psi
Cement Bond Log	Up to 3,600 ft/hr	3 ft	Image of cement between casing and formation	350 °F	20,000 psi

Parameter	Logging Speed	Vertical Resolution	Acquired Data	Temp. Rating	Pressure Rating
Caliper	1800 to 3600 ft/hr	0.12 in	Log of inside diameter of casing	350 °F	20,000 psi
Temperature Log	NA	1.2 in to 6 in depending on sampling rate	Vertical temperature profile of well	350°F	20,000 psi
°F = degrees Fahrenheit; ft = foot; ft/hr = feet per hour; in = inch; NA= not applicable; psi = pounds per square inch					

E.7.2 Acquisition of CO2 Stream Monitoring Data

Table E-4 provides the pressure gauge data quality specifications for gauge to be located at the central injection pad. Samples of the CO2 will be collected to monitor to chemical composition in addition to monitoring the mass flow, temperature, and pressure of the CO2.

Table E-4: Pressure Field Gauge – Central Injection Pad (PIT 52079 & PIT 52088)

Parameter	Value
Calibrated working pressure range	0 to 4000 psig
Initial pressure accuracy	+/-0.04% of span (1.6 psig)
Pressure resolution	+/- 0.000061% of span (0.244 psig)
Pressure drift stability	0.2% of upper range limit (8 psig) for 10 years
psig = pounds per square inch gauge	

Samples of CO2 will be collected at the central pad using the sampling container types, preservation, and holding times provided in Table E-5.

Table E-5: Summary of Sample Containers, Preservation Treatments, and Holding Times for CO2 Gas Stream Analysis.

Sample	Volume/Container Material	Preservation Technique	Sample Holding time (max)
CO2 gas stream	(2) 2L MLB Polybags (1) 75 cc Mini Cylinder	Sample cooler/cabinet	5 days
cc = cubic centimeter; L = liter			

The samples will be obtained at a sample port on the Project's central pad and analyzed for the list of constituents and parameters in Table E-6. The central pad is the connection point between the CO2 pipeline and the sequestration field's distribution system. The sampling

station will be equipped with the ability to purge and collect a gas sample into a sealed container.

Table E-6: Summary of Analytical Parameters for CO2 Stream

Parameters[1]	Analytical Methods[2]	Detection Limit/Range	Typical Precisions
Oxygen	ISBT 4.0, GC/DID or Method 3A	1 µL/L to 30 µL/L (ppm v/v)	± 10% reading
Nitrogen	ISBT 4.0, GC/DID or by difference	1 + µL/L (ppm v/v)	± 10% reading
Carbon monoxide	ISBT 5.0, GC/DID	1 µL/L to 10 µL/L (ppm v/v)	± 10% reading
Oxides of nitrogen	ISBT 7.0	0.5 µL/L to 5 µL/L (ppm v/v)	± 20% reading
Total hydrocarbons	ISBT 10.0, GC	1 µL/L to 50 µL/L (ppm v/v)	5-10% of reading
Methane	ISBT 10.1, GC	1 µL/L to 50 µL/L (ppm v/v)	5-10% of reading
Sulfur dioxide	ISBT 14.0, GC	0.05 µL/L to 1.0 µL/L (ppm v/v)	5-10% of reading
Hydrogen sulfide	ISBT 14.0, GC	0.01 µL/L to 0.1 µL/L (ppm v/v)	5-10% of reading
CO2 purity	ISBT 2.0, GC/DID or Method 3A	5.0% to 99.9%	± 10 % of reading
Water	ISBT 3.0, GC/FTIR, Method 320, EPA Method 4	1.0% to 99.9%	± 10 % of reading
µL/L = microliters per liter; DID = Discharge Ionization Detector; FTIR = Fourier Transform Infrared Spectroscopy; GC = gas chromatography; ISBT = Internation Society of Beverage Technologists; ppm = parts per million; v/v = volume/volume			

The analytical methods, detection limit and range, and typical limits of precision are provided. The quality control requirements by the laboratory will be aligned with the laboratory's certification process and may include routine calibrations per ISBT standards, method blanks, analysis of duplicate samples, and matrix spike protocols. ExxonMobil is relying on the data quality report provided by the laboratory to assess the accuracy and precision of the reported results.

E.7.3 Acquisition of Corrosion Monitoring Data

Monitoring of well tubing and casing material corrosion will be conducted on a routine basis to evaluate the corrosion coupon monitoring system. Table E-7 provides analytical testing plan for the corrosion coupons. As shown, ExxonMobil plans to follow ASTM Standard G1-03(2017)e1 and recommendations of AMPP NACE SP0775-2023 (2023). Coupons shall be sent to a qualified contractor for analysis that will use AMPP NACE SP0775-2023 for assessing coupons. The typical data reported includes length, width, thickness, weight (± 0.5 milligrams [mg]), coupon identification number, exposed dimensions, calculated surface area including the edges. The contractor will provide quality control documentation with the analytical report for reliance

by ExxonMobil. Holding times and preservation techniques are not applicable to corrosion coupon samples, which are maintained physically separated to prevent abrasion.

Table E-7: Summary of Analytical Parameters for Corrosion Coupons

Parameters	Analytical Methods	Detection Limit/Range	Typical Precisions	QC Requirements
Mass and Thickness	Baseline: ASTM G1-03(2017)e1 After Baseline: AMPP NACE SP0775-2023	± 0.2 mg	± 1%	Laboratory equipment calibration to manufacturers specification
ASTM = American Society for Testing and Materials; AMPP = Association for Materials Protection and Performance; NACE = National Association of Corrosion Engineers				

E.7.4 Acquisition of Injection Well Performance Data

ExxonMobil will install and use continuous measurement devices to monitor injection pressure, rate, and mass injected; the pressure on the annulus between the tubing and the long-string casing; and the temperature of the CO2 stream, as required under [40 CFR 146.88(e)(1), 146.89(b), and 146.90(b)]. Table E-8 provides a summary of the data acquisition and measurements limits. Data will also be collected to document the addition or removal of any fluid from the annulus system. ExxonMobil will utilize the following continuous monitoring devices:

- A Coriolis flow meter will be used to measure the flow rate at the central pad and compute flow rates for each injection well. The Coriolis flow meter directly measures the mass flow rate of the injected fluid.
- The injected CO2 stream pressure will be continuously monitored in the CO2 flowline near the wellhead interface. The annulus pressure will also be continuously recorded. The combined wellhead and downhole monitoring data will be used to continuously characterize the injection stream in detail.
- Reservoir temperatures and pressures will be measured using a fiber optic cable, embedded in the cemented annulus of the long-string casing, and a tubing encapsulated conductor pressure and temperature gauge on the injector well tubing.
- The annular pressure between the tubing and the injection casing string will be monitored on a continuous basis. The pressure gauge on the annulus will be tied into the data management system or a suitable equivalent system and set to alarm if pressure or volumes move outside set tolerances. The annulus tanks are to be equipped with a level transducer or an armored reflex sight glass and an independent liquid fill nozzle. If any annulus fluid is added or removed, it will be recorded. An annulus tank level is to be recorded on any day when injection occurs.

The calibration and operating methods will be based on the manufacturer's specifications. For the Coriolis meter, the calibration and operating methods will also be consistent with the requirements of 40 CFR 98.443(f)(2), which includes quarterly verification via alignment with check meter and online diagnostics as well as an eight-year cycle of off-site laboratory

calibration. The Coriolis meter will be out of service for short periods once per quarter for zero flow checks.

Table E-8: Summary of Measurement Parameters for Field Gauges

Equipment/Location	Parameter	Value
Pressure Field Gauge – Pressure Gauge (PIT 52127 Upstream of Choke)	Calibrated working pressure range	0 to 3,000 psig
	Initial pressure accuracy	+/-0.04% of span (1.2 psig)
	Pressure resolution	+/- 0.000061% of span (0.183 psig)
	Pressure drift stability	0.2% of upper range limit (8 psig) for 10 years
Pressure Field Gauge – Wellhead Pressure Gauge (PIT 52136B D/S of Choke)	Calibrated working pressure range	0 to 3,000 psig
	Initial pressure accuracy	+/-0.04% of span (1.2 psig)
	Pressure resolution	+/- 0.000061% of span (0.183 psig)
	Pressure drift stability	0.2% of upper range limit (8 psig) for 10 years
Pressure Field Gauge – Downhole Pressure Gauge	Calibrated working pressure range	200 to 10,000 psi
	Initial pressure accuracy	0.015 psi
	Pressure resolution	0.006 psi/sec
	Pressure drift stability	0.02 psi/year at max pressure and temperature
Temperature Field Gauge – Downhole Temperature Gauge.	Calibrated working temperature range	25 to 150 °C
	Initial temperature accuracy	0.5 °C
	Temperature resolution	0.005 °C/sec
	Temperature drift stability	0.1 °C/year at max temperature
Mass Flow Rate Field Gauge – Coriolis Meter at Central Injection Pad	Calibrated working flow rate range	0 to 200,000 kg/hr
	Initial mass flow rate accuracy	+/-0.1% of rate
	Mass flow rate resolution	Pulses +/-50 ppm
	Mass flow rate drift stability	At Central Injection Pad: Zero Point Stability – 32 kg/hr for At Well Pad: Zero Point Stability – 14 kg/hr
	Calibrated working temperature range	0 to 300 °F
	Initial temperature accuracy	0.06 °F

Equipment/Location	Parameter	Value
Pre-Injection Temperature Transmitter	Temperature resolution	0.000183 °F
	Temperature drift stability	+/-0.1% of reading or 0.18 °F whichever is greater for two years
°C = degrees Celsius; °F = degrees Fahrenheit; kg/hr = kilograms per hour; ppm = parts per million; psi = pounds per square inch; psig = pounds per square inch gauge; sec = second;		

E.7.5 Acquisition of Groundwater Monitoring Data

Samples of groundwater will be collected from Underground Source of Drinking Water (USDW) Monitoring Well No. 01, USDW Monitoring Well No. 02, and USDW Monitoring Well No. 03 and from the first water-bearing zone above the UCCZ at Above-Zone Monitor Well No. 01.

E.7.5.1 USDW Monitoring

For USDW sample collection, a decontaminated submersible pump equipped with new dedicated and disposable sampling tubing. The tubing intake will be set in the middle of the screen interval. An in-line flow-through cell (AquaTROLL 6000 or similar) will be used to continuously monitor water quality indicator parameters during well purging. A set of field measurements (Table E-9) will be collected to evaluate the trend in stability of certain parameters. The measured parameter values will be recorded in field sampling records and compared with the stabilization criteria listed in Table E-9.

Table E-9. Field Stabilization Criteria for USDW Well Sampling

Field Parameter	Stabilization Criteria
pH	+/- 0.2 units
Temperature	+/- 3%
Specific conductance	+/- 3%
Dissolved oxygen	+/- 10%
Turbidity	Stabilized or <10 NTUs
NTU = nephelometric turbidity unit	

Once water quality parameters in the purged well have stabilized, laboratory-provided sample containers will be filled, capped, labeled, and placed in a cooler with ice for transport to the laboratory. Sample containers and/or bags will be new and used as received from the selected laboratory. Table E-10 provides the specifications for sample containers. Table E-11 provides the analysis plan for groundwater samples.

Each sample will be containerized and labeled at the time of collection. The label will contain a unique sample number identifying the sampling location and sample date. The individual sample containers will be placed in a cooler with packing material. Ice or chemical ice packs will be placed on the top of the packing materials to maintain the applicable preservation temperature

(typically less than 6 degrees Celsius [°C] and without allowing the sample to become frozen) while in transport to the laboratory.

The sampler will remove waste associated with sampling activities (tubing, personal protective equipment, consumables) from the Project. Table E-10 details the preservation techniques and holding times for aqueous samples associated with this Project. Holding times and preservation techniques are not applicable to corrosion coupon samples, which are maintained physically separated to prevent abrasion.

Decontamination procedures will be followed between sampling at each monitoring well to reduce the potential for cross-contamination of groundwater samples. Field equipment will be cleaned and rinsed per standard field decontamination procedures between sampling locations. Nitrile gloves will be worn during groundwater sampling activities and while handling sample containers.

Data precision for groundwater samples will be assessed by the collection and analysis of field duplicate samples to assess the potential for sample result variability because of variation and/or error in sampling techniques. Field duplicates will be collected by taking a second sample using the same collection method in the field at a given location immediately following the original sample. The original sample will be compared with the duplicate sample to assess the degree of variability in reported results. The frequency of field duplicates is at least one sample per sample group or 10% for sample sizes above 20 samples.

For each sampling event, the field sampling activities will be recorded at each sampling location, when calibration of field instruments, details of well purging process, field parameter measurements, sample collection date and time, QA/QC sampling, and details of sample handling, storage, and shipping. The samples will be shipped under a chain-of-custody process, signed by the sampler and, upon transfer of custody to a commercial delivery service or the laboratory, tracking information will be retained. The samples will be shipped to one or more accredited laboratories for analysis.

The individual sample containers will be placed in a cooler with packing material. Ice or chemical ice packs will be placed on the top of the packing materials to maintain the applicable preservation temperature (typically less than 6 °C and without allowing the sample to become frozen) while in transport to the laboratory.

E.7.5.2 First Water-Bearing Zone Above UCCZ

Bead Farm Co. #1 will be converted to Above-Zone Monitoring Well No. 01. It will be equipped with tubing and a packer to act as a conduit for fluid collection. The sampling depth of approximately 2,560 to 2,580 feet corresponds to the first laterally continuous water-bearing formation above the UCCZ. Water samples will be collected utilizing the same procedures as the USDW samples. Monitoring will be quarterly for the first two years and then annually for the remainder of the operational phase. Table E-10 provides the specifications for sample containers and details the preservation techniques and holding times for aqueous samples associated with this Project. Table E-11 provides the analysis plan for all groundwater samples.

Table E-10: Summary of Sample Containers, Preservation Treatments, and Holding Times for Groundwater Samples

Target Parameters	**Volume/Container Material**	**Preservation Technique**	**Sample Holding Time**
EPA Method 6020A Dissolved cations (Ba, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, P, K, Si, Na, Sr, V, Zn)	1 liter, plastic	0–6 °C	60 days
EPA Method 300.0 Dissolved anions (HCO3, B(OH)4, Br, CO3, Cl, F, I, NO3, NO2, PO4, SO4, S)	1 liter, plastic	0–6 °C	28 days
Method SM 2540C Total Dissolved Solids	1 liter, plastic	0–6 °C	7 days
Method SM 2320B Alkalinity Bicarbonate (HCO3)	500 mL, plastic	0–6 °C	7 days
RSK-175 Gas composition (CO2)	Three 40 mL VOA vials	0–6 °C	14 days
RSK-175 Gas composition (CH4)	Two 40 mL VOA vials	0–6 °C, hydrochloric acid	14 days
Calculated from TKN Method 351.2 Nitrite/Nitrate 353.2	Three 250 mL, plastic	0–6 °C, sulfuric acid	48 hours
Field Methods: Electrical Conductivity, Temperature, pH, DO, ORP, turbidity	Field measurement	Not Applicable	Not Applicable
Note: The listed sample container sizes and preservation techniques may be revised based on input from the accredited laboratory selected to do the work. DO = dissolved oxygen; ORP = oxidation-reduction potential; VOA = Volatile Organic Analysis			

Table E-11: Summary of Analytical and Field Parameters for Fluid Samples in USDW and Above UCCZ

Parameters	Analytical Methods [1,2]	Typical Detection Limit or Range [3]	Typical Precisions [3]	QC Requirements [2]
Dissolved Cations: Ba, Cd, Ca, Cr, Co, Cu, Fe, Pb, Li, Mg, Mn, Mo, Ni, P, K, Si, Na, Sr, V, Zn	EPA Method 6020A	0.001 to 0.1 mg/L [4]	±15%	Daily calibration; blanks, duplicates, and matrix spikes at 10% or greater frequency
Dissolved Anions: HCO3, B(OH)4, Br, CO3, Cl, F, I, NO3, NO2, PO4, SO4, S	EPA Method 300.0	0.001 to 0.1 mg/L [4]	±15%	
Total dissolved solids	Method SM 2540C	10 mg/L	±5%	
Alkalinity Bicarbonate (HCO3)	Method SM 2320B	2 mg/L	±10%	
pH (field)	Field measurement	0–14 pH [5]	±0.1	Factory calibration and user calibration per manufacturer's instructions, duplicates
Electrical conductivity (field)	Field measurement	0–100 mS/cm [5]	±1%	
Temperature (field)	Field measurement	-10 to -55 °C [5]	±0.10	
Dissolved Oxygen (field)	Field measurement	0-50 mg/L	±0.10 mg/L	
Gas composition (CO2)	RSK-175 or ASTM D513-16 [6] depending on laboratory availability	0.1 µg/L	±15%	Daily calibration; blanks, duplicates, and matrix spikes at 10% or greater frequency
Gas composition (CH4)	RSK-175	0.1 µg/L	±15%	
Gas composition (N2)	TKN Method 351.2; Nitrite/Nitrate 353.2; or RSK-175 depending on laboratory availability	0.1 mg N	±15%	

Notes:

1. An equivalent method may be employed with the prior approval of the UIC Program Director.

Parameters	Analytical Methods [1,2]	Typical Detection Limit or Range [3]	Typical Precisions [3]	QC Requirements [2]
2. The listed analytical methods and QC requirements may be revised based on input from the accredited laboratories or field instrumentation selected to do the work. 3. The exact detection limit, range, and precision can vary depending on the sample matrix and the conditions under which the analysis is performed. Precision may also be affected by equipment utilized in analytical procedures by laboratory. 4. Analyte, dilution, and matrix dependent. 5. Dependent on manufacturer specification and calibrated range. 6. ASTM 2017b µg/L = micrograms per liter; mg N = milligrams nitrogen; mS/cm = milliSiemens per centimeter;				

E.7.6 Sample Custody for CO2 and Groundwater Samples

Possession of samples collected in the field will be traceable from the time of collection until analysis in the laboratory. The Chain-of-Custody (COC) form will be completed daily for samples collected during the sampling event and will include project name and number, sample identification number and location, name(s) of individual(s) who collected the sample(s), type of sample, number and type of containers, date and time of collection, required analyses, preservatives, shipping or courier data, and signatures documenting transfer of sample custody. From sample collection through laboratory analysis to the final evidence files, the procedures for sample handling and custody are described below. The method for demonstrating custody is a sample or evidence file is in one's custody if it is:

1. In one's physical possession.
2. In one's view during their possession.
3. In one's physical possession and placed in a secured location.
4. In a secured area restricted to authorized personnel only.

The COC form is typically provided by the laboratory with the sample kit. Once the sample containers are filled, the COC form will always accompany the sample. Individuals receiving and relinquishing the samples will sign, date, and note the time of transfer on the record. A commercial delivery service will be identified by company name. Samples will remain in the physical possession of the person to whom they are assigned until the samples are shipped to the laboratory or are stored prior to shipping. The COC form will accompany the samples to the laboratory and subsequently be returned to the Project files.

E.7.7 Acquisition of CO2 Plume and Brine Pressure Front Tracking Data

In-Zone Monitoring Well No. 01 will be equipped with a tubing encapsulated conductor cable with in-line pressure/temperature gauges to collect continuous pressure and temperature measurements for evaluating the rate of CO2 plume and pressure front movement. This system will also provide data for assessing internal mechanical integrity. Table E-12 provides a list of pressure and temperature gauge specifications for the three injection wells and in-zone monitoring well.

Table E-12: Downhole Pressure and Temperature Gauge Specifications

Parameter	Value
Calibrated working pressure range	200 to 10,000 psi
Initial pressure accuracy	0.015 psi
Pressure resolution	0.006 psi/sec
Pressure drift stability	0.02 psi/year at max pressure and temperature
Calibrated working temperature range	25–150 °C
Initial temperature accuracy	0.5 °C
Temperature resolution	0.005 °C/sec

Parameter	Value
Temperature drift stability	0.1 °C/year at 177 °C
Max temperature	177 °C
Instrument calibration frequency	Per manufacturer's specifications
psi = pounds per square inch	

Each well will also be equipped with a distributed temperature sensing cable to assess external mechanical integrity. Table E-13 provides the specifications for the distributed temperature sensing cable.

Table E-13: Downhole Pressure and Temperature Gauge Specifications

Parameter	Logging Speed	Vertical Resolution	Temp. Rating	Pressure Rating
Distributed Temperature Sensing	12 seconds	0.5-meter	-82–177°C	Not Applicable

E.8 Data Validation and Usability

Data validation procedures will be performed for both field and laboratory data to assess whether the requirements of the specified QC acceptance criteria were met. Checklists, forms, and calculations may be developed to meet the Class VI UIC permit requirements for the Project. ExxonMobil and/or its designated contractor(s) will provide verification and validation of data generated with the Project. This process may include the following elements:

1. Review the cover letter signed by the Laboratory Project Manager (or designee) to assess the laboratory narrative report regarding the overall performance of the laboratory and potential deviations or uncertainties in the data.
2. Review the case narrative discussing any technical problems or deviations from the analytical methods (e.g., did the laboratory receive the samples in good condition). Samples are considered in good condition if the samples meet temperature and preservative requirements and sample receipt condition is acceptable (i.e., the bottles are not broken and the cooler custody seals are intact).
3. Review date and time of receipt relative to holding time requirements.
4. Review COC forms to verify that samples were maintained under COC protocol with signatures from the field personnel and the lab personnel.
5. Compare sampling dates to sample extraction and analysis dates to check that these procedures were completed within proper holding times.
6. Review target constituent list, analytical methods, and result units for alignment with permit requirements.
7. Review lab summary/chronicle describing client ID/analysis, laboratory identification number, prep number, collection date, extraction/prep date, analysis date, and laboratory management sign off.

8. Review sample data report including the results listed by analytical method with sample preparation, extraction, cleanup, digestion, and analytical methods; analysis and extraction dates; analyst initials; qualifiers; and qualifier definitions.
9. Review QC summary report including date of analyses, parameters assessed, system monitoring compound summary, method blank data, sample duplicates and control samples, surrogate spike recoveries, and matrix spike/matrix spike duplicate (MS/MSD) results.
10. Review the laboratory case narrative and any corrective actions necessary and data quality assessment items.

The data quality indicators of precision, accuracy, representativeness, completeness, comparability, and sensitivity associated with newly collected data will be reviewed and an assessment made regarding the usability of the data. Data validation may include the review and evaluation of multiple data characteristics including the unit(s) of measurement, sample holding times, and QA/QC results (such as field duplicates, trip blanks, matrix spike samples). After sufficient data have been collected, additional methods, such as those described in the EPA Unified Guidance (EPA 2009), may be used to examine variations and trends in the data.

If at any point the occurrence of erroneous data were to become apparent, corrective actions will be taken to identify the cause of the error, recommend a feasible corrective action, seek approval if needed to implement corrective action, and implement the corrective action. Field team members may identify problems during sampling and laboratory analysts may identify problems during chemical analyses. Field staff will be responsible for testing equipment and performing corrective actions on broken or malfunctioning field equipment. If corrective action cannot be taken in the field, then equipment will be repair or replaced. Significant corrective actions affecting analytical results will be documented in field activity reports and re-measurement/re-sampling may occur as appropriate.

E.9 Self-Assessment of QASP

The quality system described in the QASP will be assessed to reduce the potential for questionable data to be used in the demonstration of regulatory compliance. The scope of internal assessments may include the following:

- Surveillance of scheduled field activities including sample collection, sample handling, logging, and indirect data collection (e.g., seismic data);
- Review of laboratory data management activities;
- Examination of data reporting systems;
- Verification of instrument and equipment acceptability including maintenance and calibration frequency;
- Reevaluation of analytical method implementation, including CO2 stream and corrosion evaluation methods; and
- Evaluation of external organization/contractor adherence to application elements of this QASP.

ExxonMobil may contract the collection of samples, conduct well logging, and perform other activities as outlined in the Testing and Monitoring Plan. Each organization gathering data will be responsible for conducting their internal assessments so that data acquisition is aligned with

the Testing and Monitoring Plan and QASP. In the event issues requiring corrective action are identified, corrective action will be taken to address, design, and implement corrective actions. Documentation of such corrective actions will be maintained in the data management system archives.

E.10 References

AMPP NACE (Association for Materials Protection and Performance National Association of Corrosion Engineers). 2023. Preparation, Installation, Analysis, and Interpretation of Corrosion Coupons in Hydrocarbon Operations. Standard NACE SP0775-2023.

ASTM (ASTM International). 2017a. “Standard G1-03(2017)e1: Standard Practice for Preparing, Cleaning, and Evaluating Corrosion Test Specimens.”

ASTM (ASTM International). 2017b. “Standard D513-16: Standard Test Methods for Total and Dissolved Carbon Dioxide in Water.”

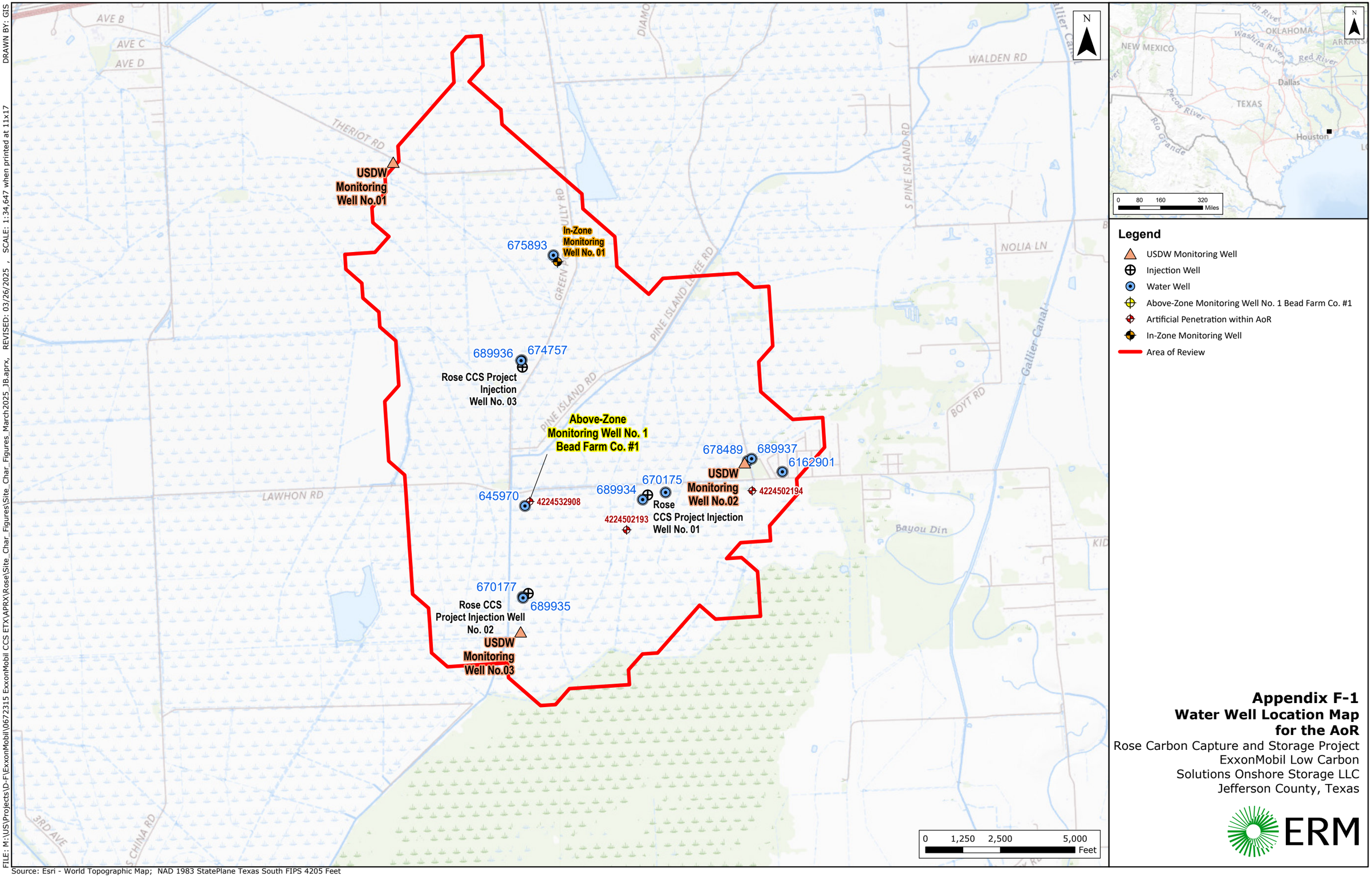
EPA (U.S. Environmental Protection Agency). 2009. Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities Unified Guidance. EPA 530/R-09-007.

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Appendix F Testing and Monitoring

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CONFIDENTIAL BUSINESS INFORMATION



Legend

- USDW Monitoring Well
- Injection Well
- Water Well
- Above-Zone Monitoring Well No. 1 Bead Farm Co. #1
- Artificial Penetration within AoR
- In-Zone Monitoring Well
- Area of Review

Appendix F-1
Water Well Location Map for the AoR
Rose Carbon Capture and Storage Project
ExxonMobil Low Carbon Solutions Onshore Storage LLC
Jefferson County, Texas

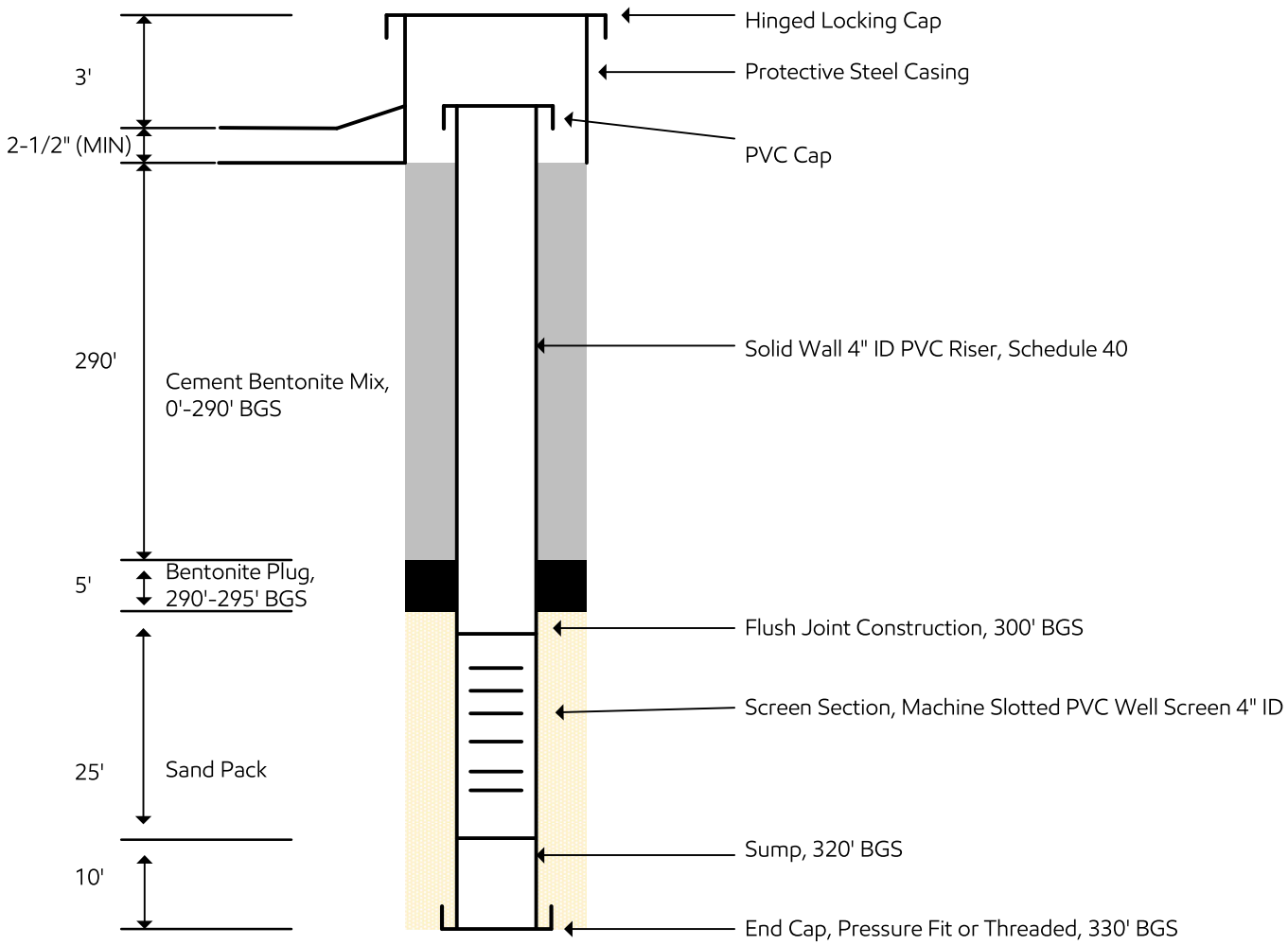
ERM

Source: Esri - World Topographic Map; NAD 1983 StatePlane Texas South FIPS 4205 Feet

FILE: M:\US\Projects\D-F\ExxonMobil\0672315 ExxonMobil CCS ETX\APRX\Rose\Site_Char_Figures\Site_Char_Figures_March2025_JB.aprx, REVISED: 03/26/2025 , SCALE: 1:34,647 when printed at 11x17 DRAWN BY: GIS

CONFIDENTIAL BUSINESS INFORMATION

Rose USDW #1
Current Schematic

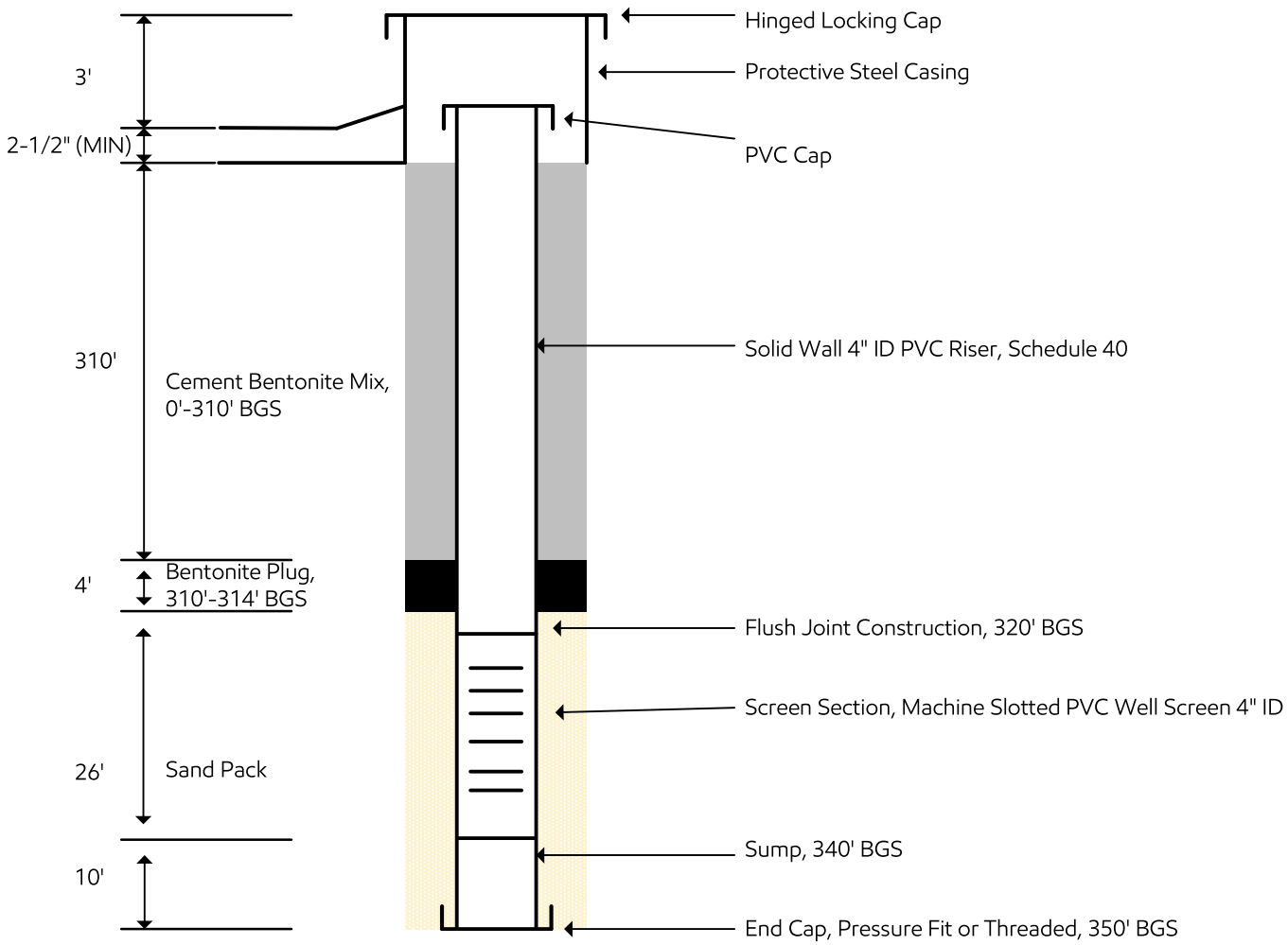


Ft BGS = Feet Below Ground Surface

CONFIDENTIAL BUSINESS INFORMATION

Rose USDW #2

Current Schematic

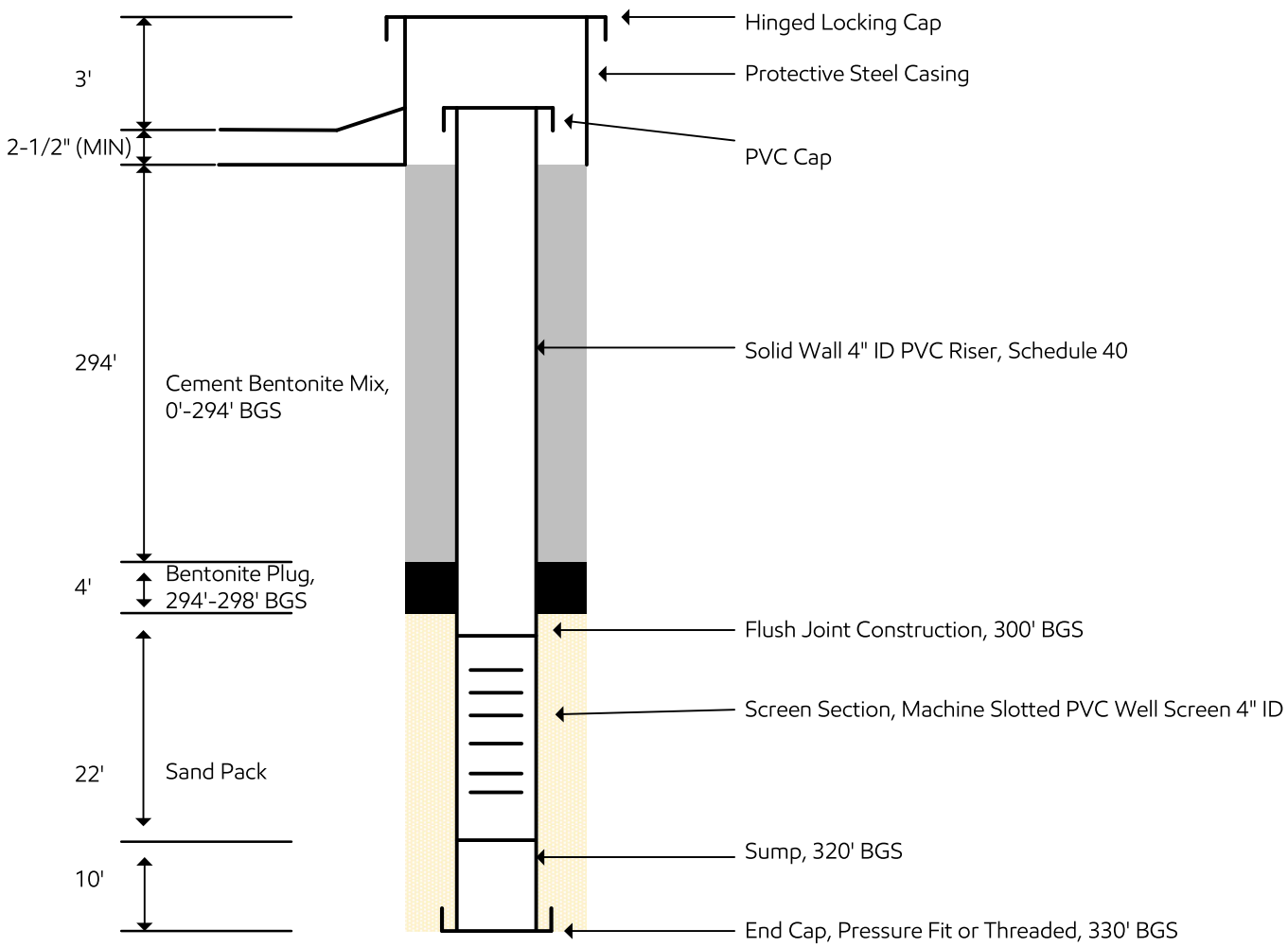


Ft BGS = Feet Below Ground Surface

CONFIDENTIAL BUSINESS INFORMATION

Rose USDW #3

Current Schematic



Ft BGS = Feet Below Ground Surface

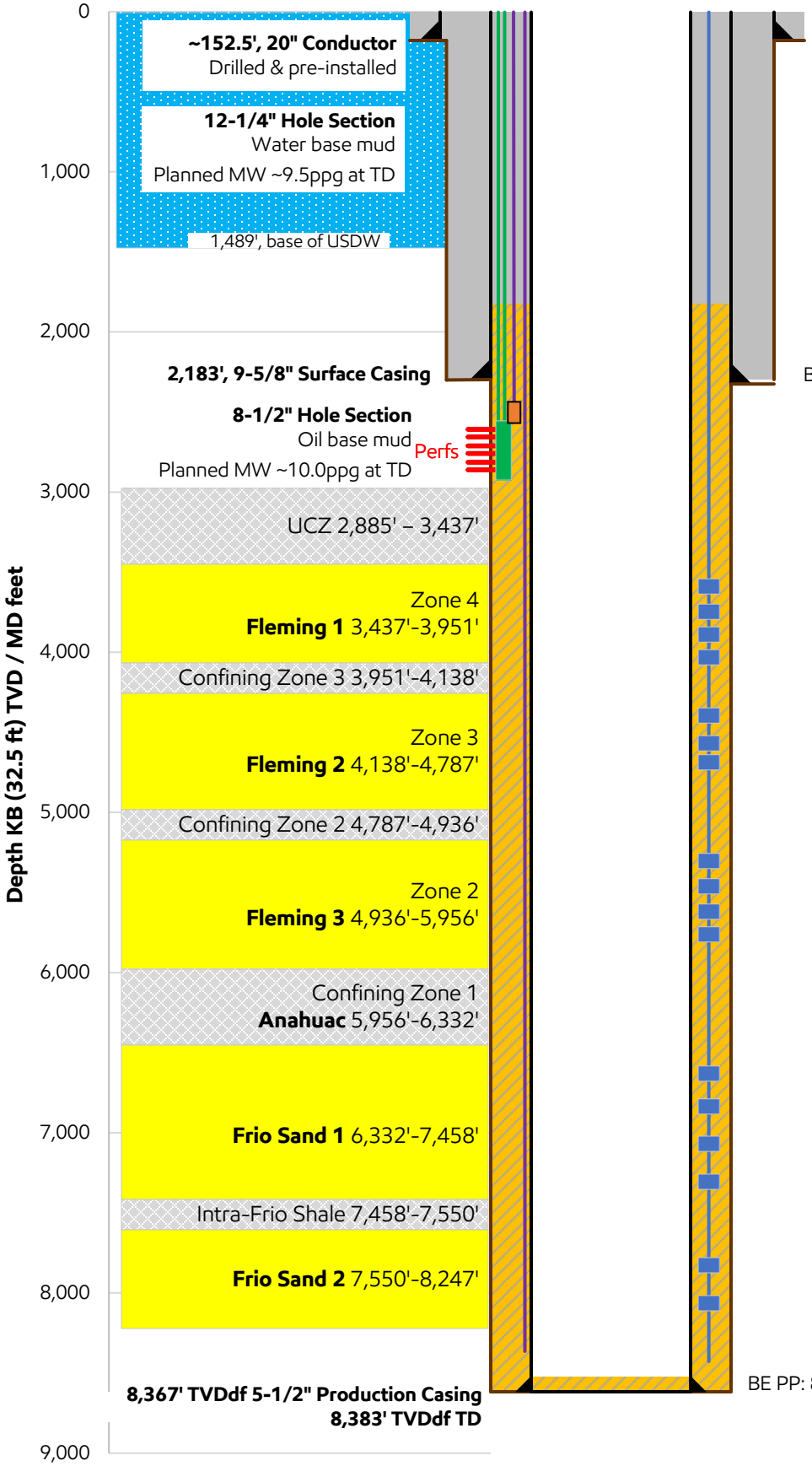
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4224532914 Bead Farm Co. #4 (In-Zone Monitoring Well No. 01)

CONFIDENTIAL BUSINESS INFORMATION

Rose CCS Project Bead Farm Company #4

Wellbore Schematic



20" Conductor
78.6 ppf, X-52, Welded
0.375" WT, 19.25" ID
Burst: 1,950, Collapse: 320 psi, Tensile: 1,202 kips

9-5/8" Surface casing, 40 ppf, J-55, BTC, from surface to 2,183'
0.395" WT, 8.835" ID, 8.679" Drift
Burst: 3,950 psi, Collapse: 2,570 psi, Tensile: 630 kips

Cement:
Lead Cmt – 12.0 ppg, Surface—1,780'
Tail Cmt – 15.0 ppg, 1,700'—2,183'

BE PP: 8.52ppg, BE FG: 12.85ppg BHST: 104°F

U-tube (2,466') + Perfs gun: Fluid sampling in permeable formation above UCZ – from 2491' to 2501'

Complete with Weatherford fiber optic P/T gauge

5-1/2", 20 ppf, L80, BTC from surface to 2,873'
0.361" WT, 4.778" ID, 4.653" Drift
Burst: 9,190 psi, Collapse: 8,830 psi, 466 kips

5-1/2", 23ppf, 22Cr125, VAM TOP from 2,873' to 3,472'
0.415" WT, 4.670" ID, 4.545" Drift
Burst: 16,980 psi, Collapse: 16,070 psi, 829 kips

5-1/2", 20 ppf, 13Cr-80, VAM21 from 3,472' to 8,234"
0.361" WT, 4.778" ID, 4.653" Drift
Burst: 9,190 psi, Collapse: 8,830 psi, 466 kips

5-1/2", 20 ppf, L80, BTC from 8,234' to 8,367'
0.361" WT, 4.778" ID, 4.653" Drift
Burst: 9,190 psi, Collapse: 8,830 psi, 466 kips

Cement:
Lead 12.5 ppg, from surface to 1,893'
Tail 13.5 ppg CO2 compatible cement, from 1,893' to 8,383'

Fiber Optic to 8,234'

TEC: P/T 17 sensors spread across 4 injection zones and permeable formation below UCZ:

Top: 3,427' 3,530' 3,692' 3,829' 4,145' 4,186' 4,696' 5,002' 5,309' 5,501' 5,795' 6,660' 6,857' 7,047' 7,267' 7,657' 7,787' MD (0.6' thickness)

BE PP: 8.62ppg, BE FG: 14.16ppg BHST: 194°F

CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32914
Drilling Permit # 901180
SWR Exception

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256

2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC

3. Operator Address (include street, city, state, zip): ATTN EDWARD E GRAHAM, 22777 SPRINGWOODS VILLAGE PKWY, SPRING, TX 77389-0000

4. Lease Name: BEAD FARM COMPANY

5. Well No.: 4

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 10000

9. Do you have the right to develop the minerals under any right-of-way ? [ ] Yes [X] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03

12. County: JEFFERSON

13. Surface Location [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 3 miles in a SE direction from China, TX which is the nearest town in the county of the well site.

15. Section: 7

16. Block:

17. Survey: HT&B RR CO

18. Abstract No.: A-150

19. Distance to nearest lease line: ft.

20. Number of contiguous acres in lease, pooled unit, or unitized tract: 454

21. Lease Perpendiculars: 522 ft from the SOUTH line and 1434 ft from the EAST line.

22. Survey Perpendiculars: 522 ft from the SOUTH line and 1434 ft from the EAST line.

23. Is this a pooled unit? [ ] Yes [X] No

24. Unitization Docket No:

25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION — List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	10000	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks

Certificate:

I certify that information stated in this application is true and complete, to the best of my knowledge.

Josh Calkin — Name of filer
Jul 10, 2024 — Date submitted

(281)702-5537 — Phone
Josh.Calkin@erm.com — E-mail Address (OPTIONAL)

RRC Use Only Data Validation Time Stamp: Mar 27, 2025 2:00 PM(Current Version)

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

***NOTIFICATION**

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
901180	Jul 11, 2024	* 03
API NUMBER	FORM W-1 RECEIVED	COUNTY
42-245-32914	Jul 10, 2024	JEFFERSON
TYPE OF OPERATION	WELLBORE PROFILE(S)	ACRES
NEW DRILL	Vertical	454

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

NOTICE
This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.
District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM COMPANY	4
LOCATION	TOTAL DEPTH
3 miles SE direction from CHINA, TX	10000

Section, Block and/or Survey

SECTION 7 BLOCK ABSTRACT 150

SURVEY HT&B RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
522 ft. SOUTH 1434 ft. EAST	ft.
DISTANCE TO LEASE LINES	DISTANCE TO NEAREST WELL ON LEASE
522 ft. SOUTH 1434 ft. EAST	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	454.00	10,000	4	03
BEAD FARM COMPANY			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

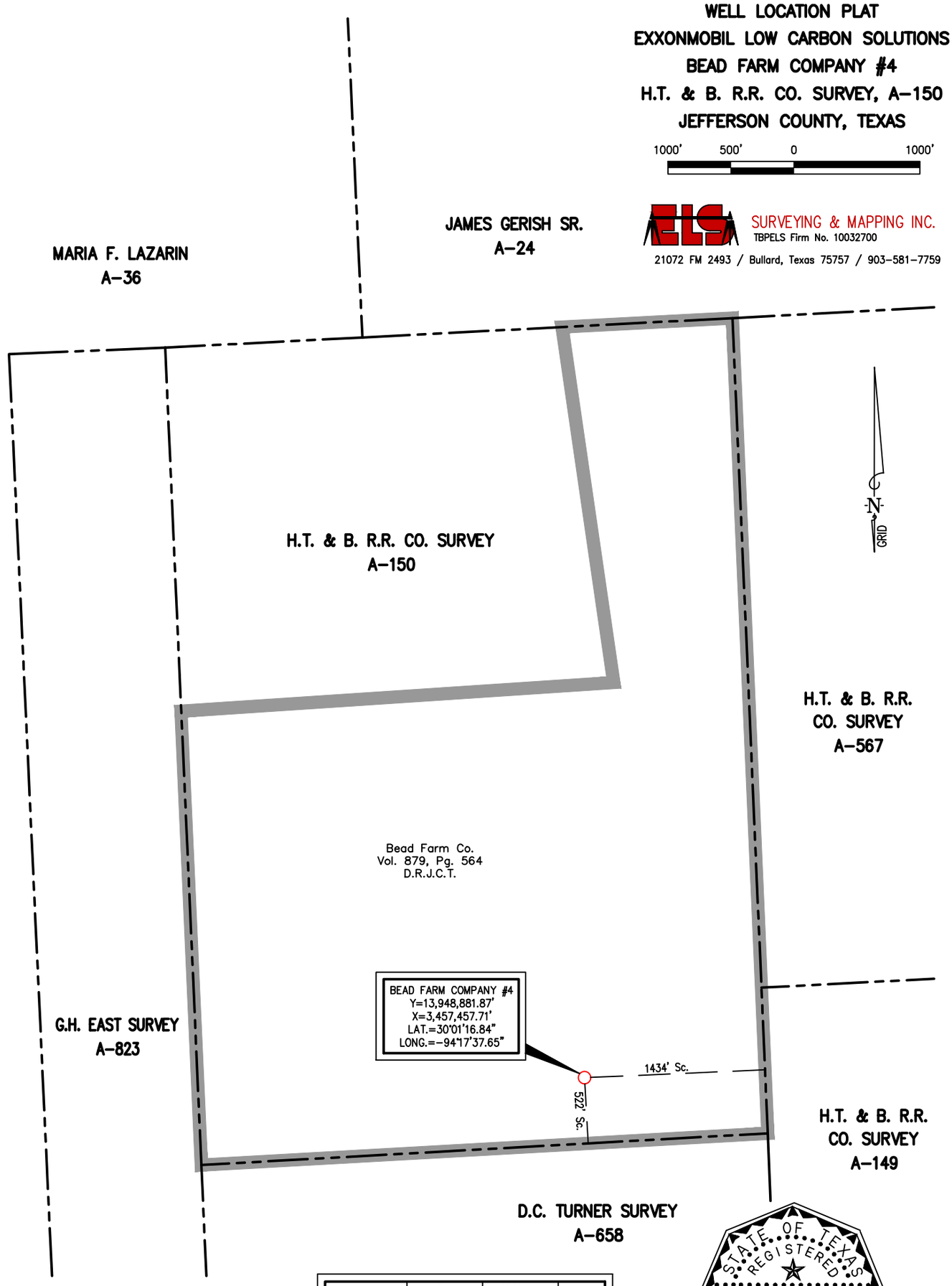
The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
BEAD FARM COMPANY #4
H.T. & B. R.R. CO. SURVEY, A-150
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

ELS SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759



SHL	TRACT CALLS	SURVEY CALLS	ELEV.
BEAD FARM COMPANY #4	522' Sc. FSL 1434' Sc. FEL	522' Sc. FSL 1434' Sc. FEL	24.0'

STATE OF TEXAS
REGISTERED
JIM G. GLASS
5262
PROFESSIONAL
LAND SURVEYOR

Location is approximately
12.3 miles SW of Beaumont, Tx.
"CHINA" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 2.8 miles turn right (North) on Green Pond Gully Road Go 1.5 miles. Turn Left (Northwest). Drive on location.

DATE SURVEYED: 5/20/2024

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data shown hereon was furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS – – – COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: May 30, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: BWT/ECJ FB 2747/36-37 Job No. 430923 Map No. J-0923-LOC-MON2

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	27 June 2024	**GAU Number:**	382934

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	
		County:	JEFFERSON
		Lease Name:	Bead Farm Company
		Lease Number:	
Operator No.:	101256	**Well Number:**	
		Total Vertical	10000
		Latitude:	30.021130
		Longitude:	-94.293605
		Datum:	NAD27

Purpose: Test Well

Location: Survey-HT&B RR CO; Abstract-150; Section-7

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

Usable-quality water occurs from the land surface to a depth of 1,100 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

This recommendation is applicable to all wells within a radius of 2,000 feet of this location.

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 06/27/2024. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 01/30/2025
Tracking No.: 326182

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-0000

WELL INFORMATION

API 42-245-32914 **County:** JEFFERSON
Well No.: 4 **RRC District** 03
Lease BEAD FARM COMPANY **Field** WILDCAT
RRC Lease 28194 **Field No.:** 00006001
Location Section: 7, Block: , Survey: HT&B RR CO, Abstract: 150

Latitude 30 **Longitud** -94
This well is 3 **miles in a** SE
direction from CHINA, TX,
which is the nearest town in the

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 10/07/2024

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	07/11/2024	901180
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 09/01/2024 **Date of first production after rig** 10/07/2024
Date plug back, deepening, drilling operation 09/01/2024 **Date plug back, deepening, recompletion, drilling operation** 10/07/2024
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 454.00 **Elevation** 24 GL
Total depth TVD 8383 **Total depth MD**
Plug back depth TVD 8283 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing** 25.8
Is Cementing Affidavit (Form W-15) Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:
Location of well, relative to nearest lease of lease on which this well is 522.0 **Feet from the** South **Line and** 1434.0 **Feet from the** East **Line of the** BEAD FARM COMPANY **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1100.0	**Date**	06/27/2024
SWR 13 Exception		**Depth**	2350.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
1	Surface	9 5/8	12 1/4	2184			H	548	1108.0	0	Circulated to Surface
2	Conventional Production	5 1/2	8 1/2	8367			H	1360	2573.5	0	Circulated to Surface

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
			/

N/A

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
1	No	L 2491	2501.0

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG)

Actual maximum pressure (PSIG) during hydraulic fracturing

fracturin

Has the hydraulic fracturing fluid disclosure been

No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)

N/A

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	
CAPROCK - DISPOSAL	No			No	
SPINDLETOP SALT DOME - DISPOSAL	No			No	
FANNETT SALT DOME - DISPOSAL	No			No	
BIG HILL SALT DOME - DISPOSAL	No			No	
PLEISTOCENE-LISSIE - DISPOSAL	No			No	
MIOCENE - DISPOSAL	Yes	3436.0	3437.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6331.0	6332.0	Yes	LOGGED
MARINULINA - DISPOSAL	No			No	
HETEROSTEGINA - DISPOSAL	Yes	6030.0	6091.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS SHUT-IN. THIS WELL HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

CASING RECORD :

CEMENT PUMPING WAS NOT REQUIRED TO SET THE CONDUCTOR CASING, AS THE CONDUCTOR WAS SUCCESSFULLY SET WITHOUT THE USE OF MUD. THE WELL WAS COMPLETED WITHOUT PUMPING OR MUD CIRCULATION. CLASS A 4000 PSI CEMENT, COMBINED WITH 5/8-INCH PEA GRAVEL AND MANUFACTURED SAND, WAS POURED DOWN THE BACKSIDE TO SECURE THE CONDUCTOR.

TUBING RECORD:

PURPOSE OF WELL TO MONITOR PRESSURE AND FLUID TRENDS. U-TUBE SAMPLER, FIBER AND TEC LINE MOUNTED ON BACKSIDE OF CASING.

PRODUCING/INJECTION/DISPOSAL INTERVAL :

U-TUBE FLUID SAMPLER WITH CASING MOUNTED GUNS ON THE BACKSIDE OF THE CASING. FLUID SAMPLING INTERVAL IS FROM 2,491 FEET MD TO 2,501 FEET MD.

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION

Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	01/09/2025

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: ExxonMobil Low Carbon Solutions	**Operator P-5 No.:** 101256
Cementer Name: Halliburton	**Cementer P-5 No.:** 347151

WELL INFORMATION

District No.: 3	**County:** Jefferson	
Well No.: Bead Farm Company #4	**API No.:** 42-245-32914	**Drilling Permit No.:** 901180
Lease Name: Bead Farm Company #4	**Lease No.:**	
Field Name: Wildcat	**Field No.:**	

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☒ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 12-1/4"	**Depth of drilled hole (ft.):** 2,199'	**Est. % wash-out or hole enlargement:** 10%
Size of casing in O.D. (in.): 9-5/8"	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☒ NO **If no for surface casing, explain in Remarks.**	**Setting depth shoe (ft.):** 2,184'	**Top of liner (ft.):** / **Setting depth liner (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:** September 2, 2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	372.02	A	See Remarks	883.74	~~404~~ 1,780
2	175.85	~~X~~ H	See Remarks	224.30	1,~~780~~ 404
3					
Total	547.87			1,108.04	2,184

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	**Depth of drilled hole (ft.):**	**Est. % wash-out or hole enlargement:**
Size of casing in O.D. (in.):	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Tapered string drilled hole size (in.) Upper: Lower:	**Tapered string depth of drilled hole (ft.)** Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	**Tapered string casing weight(lbs/ft) and grade** Upper: Lower:	**Tapered string no. of centralizers used** Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		**Setting depth shoe (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:**

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	**Depth of drilled hole (ft.):**	**Est. % wash-out or hole enlargement:**
Size of casing in O.D. (in.):	**Casing weight (lbs/ft) and grade:**	**No. of centralizers used:**
Tapered string drilled hole size (in.) Upper: Lower:	**Tapered string depth of drilled hole (ft.)** Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	**Tapered string casing weight(lbs/ft) and grade** Upper: Lower:	**Tapered string no. of centralizers used** Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		**Setting depth tool (ft.):**
Hrs. waiting on cement before drill-out:	**Calculated top of cement (ft.):**	**Cementing date:**

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

Primary surface cement job confirmed TOC @ 120' (via temp log and CBL conducted within 24 hrs). Top-off job perfomed with cement returns to surface. (DP 901180)

EXXONMOBIL LOW CARBON-EBUS, Bead Farm Company #4, Surface: SLURRY 1: ExtendaCem , SLURRY 2: HALCem

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

Name and title of cementer's representative	Cementing Company	Signature
Cale Folsom SERVICE Leader	Halliburton	

Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.
4920 Industrial Dr	Bossier City LA 71111	701-421-3299	9/2/24

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

Typed or printed name of operator's representative	Title	Signature
James Harvey	Operations Supervisor	James Harvey

Address	City,	State,	Zip Code	Tel: Area Code	Number	Date: mo. day yr.
22777 Springwoods Village Parkway	Spring	TX	77389	9189164340		9/2/2024

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.texas.gov/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing **and** Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: Exxon Mobil low Carbon Solutions	Operator P-5 No.:
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 03	County: Jefferson
Well No.: B 4	API No.: 42-245-32914 Drilling Permit No.: 901180
Lease Name: Bead Farm Company	Lease No.:
Field Name: Wildcat	Field No.:

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☑ Production

Drilled hole size (in.): 8 1/2	Depth of drilled hole (ft.): 8383	Est. % wash-out or hole enlargement: 10%
Size of casing in O.D. (in.): 5 1/2	Casing weight (lbs/ft) and grade: ~~23~~ 20, 13CR	No. of centralizers used: 188
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 8367	Top of liner (ft.):
		Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date: 9/8/2024

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	505	H	SEE RAMARKS	921.62	1323
2	855	H	SEE REMARKS	1651.86	7047
3					
Total	1360			2573.48	8370

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

EXXONMOBIL CORPORATION-EBUS,BEAD FARM CO,4,PRODUCTION:
SLURRY 1:CorossaCem , SLURRY 2:CorossaLOCK

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

ZOUHIR ROUBACHE	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	9/8/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James Harvey	Operations Supervisor		
Typed or printed name of operator's representative	Title	Signature	
22777 Springwood Village	Spring, TX 77389	5129498272	9/10/24
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON | Sperry Drilling

DGR / DIR

Powered by INSITE™

1 : 500

MD Detail Log

Country : USA
Field : WILDCAT
Location : Lat: 30° 1' 16.85" North Long: 94° 17' 37.65" West
Well : BEAD FARM COMPANY 4
Company : EXXONMOBIL LOW C SOL ON STOR LL
Rig : NABORS X33

Company	: EXXONMOBIL LOW C SOL ON STOR LL
Rig	: NABORS X33
Well	: BEAD FARM COMPANY 4
Field	: WILDCAT
Country	: USA
API Number	: 4224532914

LOCATION

Latitude : 30° 1' 16.85" North
Longitude : 94° 17' 37.65" West

UTM X = 3,457,457.710 usft
UTM Y = 13,948,881.870 usft

Other Services

Permanent Datum : Ground Level
Elevation : 27.90 ft
Log Measured From : Drill Floor
32.52 ft Above Permanent Datum
Drilling Measured From : Drill Floor

MD LOG

Elev. KB
DF 60.42 ft
GL 27.90 ft
WD

Depth Logged : 152.50 ft To 8,383.00 ft
Date Logged : 01-Sep-24 To 05-Sep-24
Total Depth MD : 8,383.00 ft TVD : 8,381.10 ft
Spud Date : 01-Sep-24

Unit No. : N/A
Job No. : LF-XX-0909035812
Plot Type : Final
Plot Date : 20-Sep-24

Run No.	Borehole Record (MD)			Size	Casing Record (MD)		
	Size	From	To		Weight	From	To
100	12.250 in	152.50 ft	2,199.00 ft	20.000 in	78.60 lbpf	SURFACE	152.50 ft
200	8.500 in	2,199.00 ft	8,383.00 ft	9.625 in	40.00 lbpf	SURFACE	2,183.00 ft

CONFIDENTIAL BUSINESS INFORMATION

WELL INFORMATION

MWD Run Number	100	200			
Date run completed	01-Sep-24	05-Sep-24			
Rig Bit Number	100	200			
Bit Size (in)	12.250	8.500			
Tool Nominal OD (in)	8.150	6.750			
Log Start Depth (MD, ft)	152.50	2,199.00			
Log End Depth (MD, ft)	2,199.00	8,383.00			
Drill or Wipe	Drill	Drill			
Drill/Wipe Start Date and Time	01-Sep-24 02:40	04-Sep-24 01:10			
Drill/Wipe End Date and Time	01-Sep-24 13:26	05-Sep-24 05:17			
Min Inc (deg) @ Depth (MD, ft)	0.18 @ 1,432.00	0.62 @ 2,928.00			
Max Inc (deg) @ Depth (MD, ft)	1.28 @ 1,717.00	2.38 @ 7,271.00			
Bit TFA(in2) / Bit Type	1.23 / HD65s	1.05 / HD65s			
Flow Rate (gpm)	700.00	600.00			
Max AV (fpm) / CV (fpm) @ MWD	80.0 / 46.0	171.0 / 350.0			
Fluid Type	Diesel Mud Base	Diesel Mud Base			
Density (ppg) / Viscosity (spqt)	9.30 / 32.00	10.25 / 67.00			
Filtrate CL (ppm)	1,300.00	57,000.00			
pH / API Filtrate (mptm)	8.10 / 8	N/A / 2			
PV (cP) / YP (lhf2)	4 / 4.00	22 / 29.00			
% Solids / % Sand	5.9 / 0	10.7 / 0			
% Oil / Oil:Water Ratio	0 / 0:100	56 / 65:35			
Rm @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A			
Rmf @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A			
Rmc @ Measured Temp (degF)	0.200 @ 87.00	N/A @ N/A			
Max Tool Temp (degF) / Source	113.18 / HCIM	173.18 / HCIM			
Rm @ Max Tool Temp (degF)	N/A @ 113.18	N/A @ 173.18			
Lead MWD Engineer	Daniel Nalin	Daniel Nalin			
Customer Representative	N/A	N/A			

SENSOR INFORMATION

Downhole Processor Information

Tool Type	HCIM	HCIM			
Software Version	98.43	98.43			
Sub Serial Number	11432374	13172015			
Insert Serial Number	11753209	250429			
Date and Time Initialized	31-Aug-24 18:21	03-Sep-24 17:42			
Date and Time Read	01-Sep-24 19:40	05-Sep-24 18:56			
ECMB SW Version	N/A	N/A			

Directional Sensor Information

Tool Type	PCDC	PCDC			
Distance From Bit (ft)	19.63	58.07			
Software Version	6.43	6.43			
Sub Serial Number	11233637	11112526			
Sonde Serial Number	11902241	11902011			
Sensor ID Number	N/A	N/A			
Toolface Offset (deg)	0.00	310.00			

Gamma Ray Sensor Information

Tool Type	DGR	DGR			
Distance From Bit (ft)	9.58	46.35			
Recorded Sample Period (sec)	4	4			
Software Version	N/A	N/A			
Sub Serial Number	11654485	12444096			
Insert/Sonde Serial Number	11671533	263646			

REMARKS

All depths are referenced to the driller's pipe tally.

DGXT - Gamma Ray formation exposure time

Default 1:500 Log Smoothing:
Interval Resolution: 0.5ft
Window Interval:(+/-) 0.6ft
Gap Fill: 3.0ft

Archive Name: BEAD_FARM_COMPANY_4_500MD_DETAIL_152_8383

Plot Width: 8.25 in

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division

ELECTRIC LOG STATUS REPORT

FORM L-1

Tracking No.: 326182

This facsimile L-1 was generated electronically from data submitted to the RRC.

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 10/07/2024
Field Name WILDCAT	Drilling Permit No. 901180	
Lease Name BEAD FARM COMPANY	Lease/ID No. 28194	Well No. 4
County JEFFERSON	API No. 42- 245-32914	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

Lease or ID No(s). _____

Well No(s). _____

Josh Calkin
Signature

Title

EXXONMOBIL LOW C SOL ON STOR LLC
Name (print)

(281) 702-5537
Phone

12/18/2024
Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Kristen Killen,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **September 1, 2024 to September 5, 2024** conduct or supervise the taking of Directional Surveys as follow:

- **306' to a depth of 8320' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8383'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **BEAD FARM COMPANY 4** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Kristen Killen, Log Analyst

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON
4607 HWY 90 EAST • BROUSSARD, LA 70518
PHONE 337 837 3061 • FAX 337 837 4400

September 20, 2024

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
BEAD FARM COMPANY 4
Permit No. 901180
Jefferson County, TX
API # 42-245-32914

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Kristen Killen, Log Analyst
Drainhole Number	-	Original
Surveyed Depths	-	306' – 8320' MWD Surveys performed by Sperry Drilling
Dates Performed	-	September 1, 2024 to September 5, 2024
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,

Kristen Killen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 909035812

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx_NAD83
Rose Prospect CCS
Bead Farm Company 4
4224532914
004 ST00BP00 Monitor

Design: 004 ST00BP00

Sperry Drilling Services

Geodetic Report

16 September, 2024

Well Coordinates: 4,251,627.70 N, 1,053,835.22 E (30° 01' 16.84" N, 094° 17' 37.65" W)
Ground Level: 27.90 ft

Local Coordinate Origin:	Centered on Well Bead Farm Company 4
Viewing Datum:	(32.52') Nabors X-33 @ 60.4ft (Spud)
TVDs to System:	N
North Reference:	Grid
Unit System:	API

Version: 5000.17 Build: 04

HALLIBURTON

Design Report for Bead Farm Company 4 - 004 ST00BP00

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Geographic Coordinates Latitude (ft)	Geographic Coordinates Longitude (ft)	UTM Coordinates Northing (m)	UTM Coordinates Easting (m)
0.0	0.00	0.00	0.0	0.0	0.0	30° 1' 16.845 N	94° 17' 37.650 W	4,251,627.70	1,053,835.22
306.0	0.32	198.12	306.0	-0.8	-0.3	30° 1' 16.837 N	94° 17' 37.654 W	4,251,627.45	1,053,835.14
414.0	0.47	222.63	414.0	-1.4	-0.7	30° 1' 16.831 N	94° 17' 37.658 W	4,251,627.26	1,053,835.02
502.0	0.50	238.67	502.0	-1.9	-1.2	30° 1' 16.827 N	94° 17' 37.665 W	4,251,627.12	1,053,834.84
610.0	0.56	223.44	610.0	-2.5	-2.0	30° 1' 16.821 N	94° 17' 37.674 W	4,251,626.93	1,053,834.61
684.0	0.73	217.70	684.0	-3.2	-2.5	30° 1' 16.815 N	94° 17' 37.681 W	4,251,626.74	1,053,834.45
774.0	0.71	220.18	774.0	-4.0	-3.2	30° 1' 16.806 N	94° 17' 37.689 W	4,251,626.47	1,053,834.23
862.0	0.57	228.82	862.0	-4.7	-3.9	30° 1' 16.800 N	94° 17' 37.697 W	4,251,626.25	1,053,834.02
956.0	0.64	221.03	956.0	-5.4	-4.6	30° 1' 16.793 N	94° 17' 37.705 W	4,251,626.04	1,053,833.81
1,053.0	0.68	235.33	1,053.0	-6.2	-5.5	30° 1' 16.786 N	94° 17' 37.715 W	4,251,625.81	1,053,833.56
1,149.0	0.43	209.78	1,149.0	-6.8	-6.1	30° 1' 16.780 N	94° 17' 37.723 W	4,251,625.62	1,053,833.36
1,243.0	0.31	224.36	1,243.0	-7.3	-6.5	30° 1' 16.775 N	94° 17' 37.727 W	4,251,625.47	1,053,833.25
1,335.0	0.37	83.65	1,335.0	-7.4	-6.3	30° 1' 16.774 N	94° 17' 37.726 W	4,251,625.43	1,053,833.29
1,432.0	0.18	65.07	1,432.0	-7.3	-5.9	30° 1' 16.775 N	94° 17' 37.720 W	4,251,625.46	1,053,833.43
1,527.0	0.25	159.60	1,527.0	-7.5	-5.7	30° 1' 16.773 N	94° 17' 37.718 W	4,251,625.42	1,053,833.49
1,620.0	0.57	127.86	1,620.0	-8.0	-5.2	30° 1' 16.768 N	94° 17' 37.713 W	4,251,625.27	1,053,833.62
1,717.0	1.28	135.35	1,716.9	-9.0	-4.1	30° 1' 16.757 N	94° 17' 37.701 W	4,251,624.95	1,053,833.97
1,815.0	1.23	141.72	1,814.9	-10.6	-2.7	30° 1' 16.741 N	94° 17' 37.686 W	4,251,624.46	1,053,834.40
1,907.0	1.11	133.32	1,906.9	-12.0	-1.4	30° 1' 16.727 N	94° 17' 37.672 W	4,251,624.04	1,053,834.79
1,998.0	0.78	120.21	1,997.9	-12.9	-0.2	30° 1' 16.717 N	94° 17' 37.659 W	4,251,623.76	1,053,835.15
2,092.0	0.75	133.29	2,091.9	-13.7	0.8	30° 1' 16.709 N	94° 17' 37.648 W	4,251,623.53	1,053,835.45
2,178.0	0.91	127.05	2,177.9	-14.5	1.7	30° 1' 16.701 N	94° 17' 37.637 W	4,251,623.29	1,053,835.74
2,264.0	0.88	125.11	2,263.9	-15.3	2.8	30° 1' 16.693 N	94° 17' 37.625 W	4,251,623.05	1,053,836.07
2,361.0	0.86	135.03	2,360.8	-16.2	3.9	30° 1' 16.683 N	94° 17' 37.613 W	4,251,622.76	1,053,836.41
2,451.0	0.96	152.98	2,450.8	-17.4	4.7	30° 1' 16.671 N	94° 17' 37.604 W	4,251,622.41	1,053,836.66
2,545.0	1.05	155.00	2,544.8	-18.8	5.5	30° 1' 16.656 N	94° 17' 37.597 W	4,251,621.96	1,053,836.88
2,642.0	0.89	152.80	2,641.8	-20.3	6.2	30° 1' 16.642 N	94° 17' 37.589 W	4,251,621.51	1,053,837.10
2,733.0	0.81	161.95	2,732.8	-21.6	6.7	30° 1' 16.629 N	94° 17' 37.584 W	4,251,621.13	1,053,837.26
2,830.0	0.75	164.25	2,829.8	-22.8	7.1	30° 1' 16.616 N	94° 17' 37.580 W	4,251,620.74	1,053,837.38
2,928.0	0.62	164.53	2,927.8	-23.9	7.4	30° 1' 16.605 N	94° 17' 37.577 W	4,251,620.40	1,053,837.48
3,019.0	0.63	154.06	3,018.8	-24.9	7.8	30° 1' 16.596 N	94° 17' 37.573 W	4,251,620.12	1,053,837.58
3,115.0	0.65	156.66	3,114.8	-25.8	8.2	30° 1' 16.586 N	94° 17' 37.569 W	4,251,619.82	1,053,837.72
3,207.0	0.75	162.03	3,206.8	-26.9	8.6	30° 1' 16.576 N	94° 17' 37.565 W	4,251,619.50	1,053,837.84
3,302.0	0.82	170.76	3,301.8	-28.2	8.9	30° 1' 16.563 N	94° 17' 37.562 W	4,251,619.12	1,053,837.93
3,396.0	0.81	168.40	3,395.7	-29.5	9.1	30° 1' 16.550 N	94° 17' 37.560 W	4,251,618.71	1,053,838.00
3,415.8	0.81	169.63	3,415.6	-29.7	9.2	30° 1' 16.547 N	94° 17' 37.559 W	4,251,618.63	1,053,838.02
3,490.0	0.83	174.11	3,489.7	-30.8	9.3	30° 1' 16.537 N	94° 17' 37.558 W	4,251,618.31	1,053,838.07
3,585.0	0.76	182.72	3,584.7	-32.1	9.4	30° 1' 16.524 N	94° 17' 37.558 W	4,251,617.91	1,053,838.08
3,679.0	0.75	176.68	3,678.7	-33.3	9.4	30° 1' 16.511 N	94° 17' 37.559 W	4,251,617.53	1,053,838.08
3,774.0	0.69	165.36	3,773.7	-34.5	9.6	30° 1' 16.500 N	94° 17' 37.557 W	4,251,617.17	1,053,838.14
3,867.0	0.63	187.14	3,866.7	-35.6	9.7	30° 1' 16.489 N	94° 17' 37.557 W	4,251,616.85	1,053,838.16
3,961.0	0.69	183.27	3,960.7	-36.7	9.6	30° 1' 16.479 N	94° 17' 37.558 W	4,251,616.53	1,053,838.13

CONFIDENTIAL BUSINESS INFORMATION

Design Report for Bead Farm Company 4 - 004 ST00BP00

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	UTM Coordinates Northing (m)	UTM Coordinates Easting (m)
4,056.0	1.00	37.32	4,055.7	-36.6	10.0	30° 1' 16.479 N	94° 17' 37.553 W	4,251,616.55	1,053,838.27
4,150.0	1.12	45.72	4,149.7	-35.3	11.2	30° 1' 16.492 N	94° 17' 37.539 W	4,251,616.95	1,053,838.63
4,245.0	0.86	49.51	4,244.7	-34.2	12.4	30° 1' 16.502 N	94° 17' 37.525 W	4,251,617.29	1,053,838.99
4,434.0	0.63	55.87	4,433.7	-32.7	14.3	30° 1' 16.516 N	94° 17' 37.502 W	4,251,617.74	1,053,839.58
4,523.0	0.81	47.37	4,522.6	-32.0	15.2	30° 1' 16.523 N	94° 17' 37.492 W	4,251,617.96	1,053,839.85
4,600.0	0.93	49.95	4,599.6	-31.2	16.1	30° 1' 16.530 N	94° 17' 37.482 W	4,251,618.19	1,053,840.12
4,717.0	1.10	44.11	4,716.6	-29.8	17.6	30° 1' 16.544 N	94° 17' 37.464 W	4,251,618.62	1,053,840.58
4,813.0	1.20	50.22	4,812.6	-28.5	19.0	30° 1' 16.556 N	94° 17' 37.447 W	4,251,619.02	1,053,841.01
4,907.0	1.14	56.10	4,906.6	-27.3	20.5	30° 1' 16.567 N	94° 17' 37.429 W	4,251,619.37	1,053,841.47
5,002.0	1.30	54.06	5,001.6	-26.1	22.2	30° 1' 16.577 N	94° 17' 37.410 W	4,251,619.73	1,053,841.98
5,098.0	1.30	48.08	5,097.5	-24.8	23.9	30° 1' 16.590 N	94° 17' 37.390 W	4,251,620.14	1,053,842.50
5,192.0	1.27	65.27	5,191.5	-23.6	25.6	30° 1' 16.601 N	94° 17' 37.370 W	4,251,620.49	1,053,843.03
5,287.0	1.44	67.44	5,286.5	-22.7	27.7	30° 1' 16.609 N	94° 17' 37.346 W	4,251,620.77	1,053,843.65
5,380.0	1.58	61.93	5,379.5	-21.7	29.9	30° 1' 16.619 N	94° 17' 37.321 W	4,251,621.09	1,053,844.33
5,475.0	1.41	332.54	5,474.4	-20.0	30.5	30° 1' 16.635 N	94° 17' 37.313 W	4,251,621.59	1,053,844.51
5,570.0	1.54	324.88	5,569.4	-17.9	29.2	30° 1' 16.656 N	94° 17' 37.326 W	4,251,622.23	1,053,844.13
5,664.0	1.65	324.88	5,663.4	-15.8	27.7	30° 1' 16.678 N	94° 17' 37.342 W	4,251,622.88	1,053,843.67
5,758.0	1.72	324.00	5,757.3	-13.6	26.1	30° 1' 16.700 N	94° 17' 37.360 W	4,251,623.56	1,053,843.18
5,852.0	1.59	327.25	5,851.3	-11.3	24.6	30° 1' 16.723 N	94° 17' 37.376 W	4,251,624.25	1,053,842.71
5,947.0	1.76	326.45	5,946.2	-9.0	23.1	30° 1' 16.747 N	94° 17' 37.392 W	4,251,624.95	1,053,842.25
6,042.0	1.83	325.28	6,041.2	-6.5	21.4	30° 1' 16.772 N	94° 17' 37.410 W	4,251,625.70	1,053,841.74
6,136.0	1.55	320.67	6,135.2	-4.3	19.7	30° 1' 16.794 N	94° 17' 37.428 W	4,251,626.38	1,053,841.23
6,230.0	1.74	328.51	6,229.1	-2.1	18.2	30° 1' 16.817 N	94° 17' 37.445 W	4,251,627.05	1,053,840.76
6,325.0	1.67	328.65	6,324.1	0.3	16.7	30° 1' 16.841 N	94° 17' 37.460 W	4,251,627.79	1,053,840.31
6,419.0	1.61	334.63	6,418.0	2.7	15.4	30° 1' 16.865 N	94° 17' 37.474 W	4,251,628.51	1,053,839.92
6,514.0	1.72	331.62	6,513.0	5.1	14.2	30° 1' 16.890 N	94° 17' 37.487 W	4,251,629.26	1,053,839.54
6,609.0	1.67	330.10	6,608.0	7.6	12.8	30° 1' 16.915 N	94° 17' 37.501 W	4,251,630.00	1,053,839.12
6,703.0	1.84	340.46	6,701.9	10.2	11.6	30° 1' 16.941 N	94° 17' 37.514 W	4,251,630.80	1,053,838.76
6,797.0	1.98	336.67	6,795.9	13.1	10.5	30° 1' 16.970 N	94° 17' 37.525 W	4,251,631.69	1,053,838.41
6,893.0	2.28	321.94	6,891.8	16.1	8.6	30° 1' 17.001 N	94° 17' 37.545 W	4,251,632.61	1,053,837.85
6,987.0	2.20	322.22	6,985.7	19.0	6.4	30° 1' 17.031 N	94° 17' 37.569 W	4,251,633.49	1,053,837.16
7,081.0	2.13	327.85	7,079.7	21.9	4.3	30° 1' 17.060 N	94° 17' 37.591 W	4,251,634.38	1,053,836.54
7,176.0	2.19	330.29	7,174.6	25.0	2.5	30° 1' 17.091 N	94° 17' 37.610 W	4,251,635.32	1,053,835.98
7,271.0	2.38	329.87	7,269.5	28.3	0.6	30° 1' 17.124 N	94° 17' 37.630 W	4,251,636.32	1,053,835.41
7,365.0	2.32	329.24	7,363.4	31.6	-1.3	30° 1' 17.158 N	94° 17' 37.651 W	4,251,637.33	1,053,834.81
7,459.0	2.04	328.07	7,457.4	34.7	-3.2	30° 1' 17.189 N	94° 17' 37.671 W	4,251,638.26	1,053,834.24
7,554.0	1.11	302.87	7,552.3	36.6	-4.9	30° 1' 17.209 N	94° 17' 37.689 W	4,251,638.85	1,053,833.74
7,648.0	1.06	286.01	7,646.3	37.3	-6.5	30° 1' 17.217 N	94° 17' 37.707 W	4,251,639.07	1,053,833.25
7,743.0	1.05	266.73	7,741.3	37.5	-8.2	30° 1' 17.219 N	94° 17' 37.726 W	4,251,639.13	1,053,832.73
7,838.0	0.93	267.08	7,836.3	37.4	-9.8	30° 1' 17.219 N	94° 17' 37.745 W	4,251,639.11	1,053,832.23
7,933.0	1.31	273.72	7,931.3	37.5	-11.7	30° 1' 17.220 N	94° 17' 37.766 W	4,251,639.11	1,053,831.66
8,028.0	1.54	274.02	8,026.2	37.6	-14.0	30° 1' 17.223 N	94° 17' 37.792 W	4,251,639.16	1,053,830.94

Design Report for Bead Farm Company 4 - 004 ST00BP00

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	UTM Coordinates Northing (m)	UTM Coordinates Easting (m)
8,122.0	1.54	272.79	8,120.2	37.8	-16.5	30° 1' 17.225 N	94° 17' 37.821 W	4,251,639.21	1,053,830.17
8,216.0	1.42	278.74	8,214.2	38.0	-19.0	30° 1' 17.228 N	94° 17' 37.848 W	4,251,639.28	1,053,829.44
8,320.0	1.48	303.75	8,318.1	38.9	-21.3	30° 1' 17.239 N	94° 17' 37.875 W	4,251,639.57	1,053,828.71
8,383.0	1.48	303.75	8,381.1	39.9	-22.7	30° 1' 17.248 N	94° 17' 37.890 W	4,251,639.84	1,053,828.30

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
8,383.0	8,381.1	39.9	-22.7	Proj. to Bit

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	0.00	Slot	0.0	0.0	0.0

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
306.0	2,178.0	01 HAL MWD (MagVarMS) 12 1/4" Hole 306' - 2178'	3_MWD+HRGM+MS
2,264.0	8,320.0	02 HAL MWD (MagVarMS) 8 1/2" Hole 2264' - 8320'	3_MWD+HRGM+MS

Casing Details

Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (in)	Hole Diameter (in)
152.5	152.5	20" Conductor Casing	20.000	20.000
2,184.0	2,183.9	9-5/8" Surface Casing	9.625	12.250
8,367.5	8,365.6	5-1/2" Production Casing	5.500	8.500

CONFIDENTIAL BUSINESS INFORMATION

Design Report for Bead Farm Company 4 - 004 ST00BP00

Targets for 004 ST00BP00 Monitor

Shape	Target Name	TVD (ft)	Northing (m)	Easting (m)	+N/-S ft	+E/-W ft	Created	Updated
Polygon	Rose2 T. Fleming SD Rect. 400'	3,562.0	4,248,251.97	1,053,561.35	-11,075.2	-898.5	5/13/2024	7/5/2024
Polygon	Rose1 T. Fleming SD Rect. 400'	3,508.3	4,249,261.67	1,054,768.97	-7,762.6	3,063.5	5/13/2024	6/17/2024
Polygon	Rose BF4 T. Fleming SD Rect. 150'	3,416.0	4,251,627.70	1,053,835.22	0.0	0.0	7/30/2024	8/29/2024

North Reference Sheet for Rose Prospect CCS - Bead Farm Company 4 - 004 ST00BP00 Monitor

All data is in Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 60.4ft (Spud). Northing and Easting are relative to Bead Farm Company 4

Coordinate System is US State Plane 1983, Texas South Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 600,000.00m, False Northing: 4,000,000.00m, Scale Reduction: 0.99993482

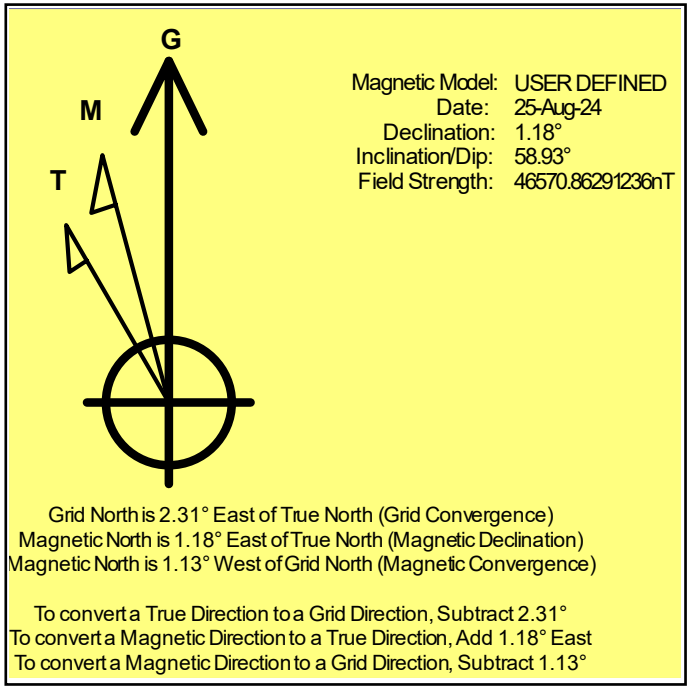
Grid Coordinates of Well: 4,251,627.70 m N, 1,053,835.22 m E

Geographical Coordinates of Well: 30° 01' 16.84" N, 094° 17' 37.65" W

Grid Convergence at Surface is: 2.31°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,383.02ft

the Bottom Hole Displacement is 45.86ft in the Direction of 330.33° (Grid).
Magnetic Convergence at surface is: 1.13° (25 August 2024, , User Defined)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

***NOTIFICATION**

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
901180	Jul 11, 2024	* 03
API NUMBER	FORM W-1 RECEIVED	COUNTY
42-245-32914	Jul 10, 2024	JEFFERSON
TYPE OF OPERATION	WELLBORE PROFILE(S)	ACRES
NEW DRILL	Vertical	454

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE
This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.
District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM COMPANY	4
LOCATION	TOTAL DEPTH
3 miles SE direction from CHINA, TX	10000

Section, Block and/or Survey

SECTION 7 BLOCK ABSTRACT 150

SURVEY HT&B RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
522 ft. SOUTH 1434 ft. EAST	ft.
DISTANCE TO LEASE LINES	DISTANCE TO NEAREST WELL ON LEASE
522 ft. SOUTH 1434 ft. EAST	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	454.00	10,000	4	03
BEAD FARM COMPANY			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

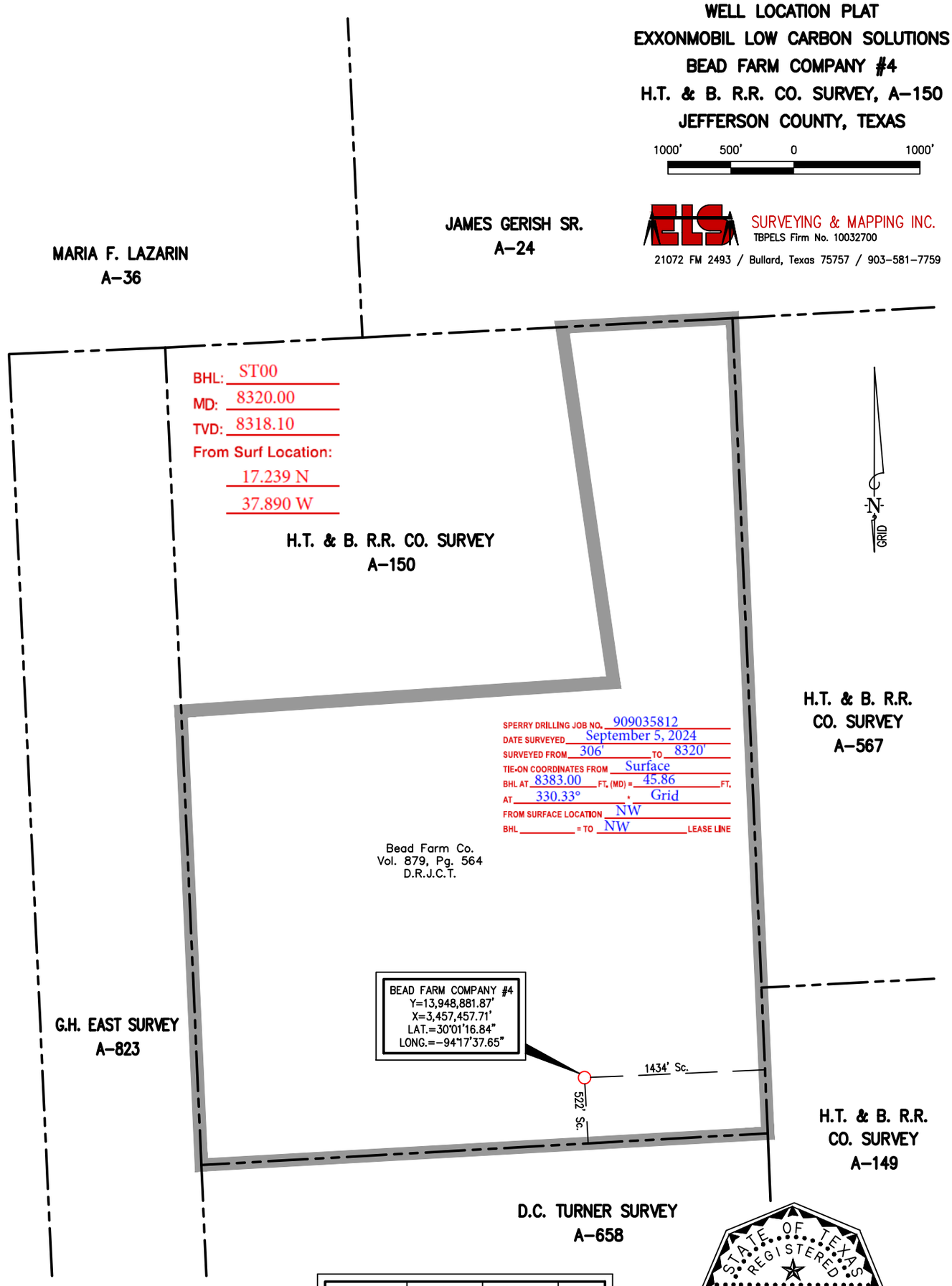
The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

WELL LOCATION PLAT
EXXONMOBIL LOW CARBON SOLUTIONS
BEAD FARM COMPANY #4
H.T. & B. R.R. CO. SURVEY, A-150
JEFFERSON COUNTY, TEXAS

1000' 500' 0 1000'

ELS SURVEYING & MAPPING INC.
TBPELS Firm No. 10032700
21072 FM 2493 / Bullard, Texas 75757 / 903-581-7759



SHL	TRACT CALLS	SURVEY CALLS	ELEV.
BEAD FARM COMPANY #4	522' Sc. FSL 1434' Sc. FEL	522' Sc. FSL 1434' Sc. FEL	24.0'

STATE OF TEXAS REGISTERED
JIM G. GLASS
5262
PROFESSIONAL LAND SURVEYOR

Location is approximately
12.3 miles SW of Beaumont, Tx.
"CHINA" Quadrangle

Driving Directions:
From the Intersection of I10 and Smith Road near Cheek, TX, go Northwest on Smith Road, .8 miles turn left (West) Kidd Road. Go 1.6 miles turn right (North) on Boyt Road. Go 1.1 miles stay straight (West) on Lawhon Rd. Go 2.8 miles turn right (North) on Green Pond Gully Road Go 1.5 miles. Turn Left (Northwest). Drive on location.

DATE SURVEYED: 5/20/2024

Location is staked from tract lines as evidenced by occupation, information obtained from the Tx. R.R.C and provided deed records. Distances shown are not intended to be definitive in establishing actual title boundaries. The deed data shown hereon was furnished by others. This is not a title survey. Vesting documents may not have been provided. Bearings and distances are based on the Texas State Plane Coordinate System N.A.D. 83 (2011) (South Central Zone) derived from GPS Observations.

LEGEND
= TRACT LINE
= SURVEY LINE
= PROPOSED WELL

FOR THE EXCLUSIVE USE OF
EXXONMOBIL LOW CARBON SOLUTIONS

STATE OF TEXAS – – – COUNTY OF SMITH
I, Jim G. Glass, Registered Professional Land Surveyor, do hereby certify the above plat to be true and correct to the best of my knowledge.
Date: May 30, 2024 Bullard, Texas
E.L.S. Surveying & Mapping, Inc.

Registered Professional Land Surveyor No. 5262

Drafter: BWT/ECJ FB 2747/36-37 Job No. 430923 Map No. J-0923-LOC-MON2

CONFIDENTIAL BUSINESS INFORMATION

CHRISTI CRADDICK, CHAIRMAN
WAYNE CHRISTIAN, COMMISSIONER
JIM WRIGHT, COMMISSIONER



DANNY SORRELLS
DIRECTOR, OIL AND GAS DIVISION
PETER FISHER, P.G.
DISTRICT DIRECTOR

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

OPERATOR Name:	EXXONMOBIL LOW C SOL ON	**RE:**	**Lease:**	BEAD FARM COMPANY
Address1:	ATTN EDWARD E GRAHAM			
Address2:	22777 SPRINGWOODS VILLAGE PKWY	**Well No:**	4	
City:	SPRING	**Sec:**	7	**Block:**
State:	TX	**County:**	JEFFERSON	
		Survey Name:	HT&B RR CO	

SWR13EX Application Number: 132309 **Drilling Permit No:** 901180

SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for **LEASE** BEAD FARM COMPANY ;
WELL 4 has been approved by the Railroad Commission of Texas District Office.

a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.

b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.

c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.

d. The casing and cement program shall adhere to the following specifications:

Set 2350 feet of surface casing and circulate cement from the shoe to the ground surface.

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted 07/18/2024 .
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: AUDREY KUKLENZ DATE: 07/22/2024

PETER FISHER, P.G.

DISTRICT DIRECTOR

CONFIDENTIAL BUSINESS INFORMATION

22777 Springwoods Parkway
Spring, Texas 77389

To whom it may concern,

This notice is to inform that the Bead Farm Company #4 well (API# 42-245-32914), located in Jefferson County, Texas, will be converted into a monitoring well. The well has been equipped with the with the following instrumentation:

- Electric line (TEC) from surface to a well depth of 7,787 feet MD with pressure and temperature sensors installed intermittently from 3,347 feet MD to 7,787 feet MD.
- Fiber optic pressure and temperature gauge sensor at 2,475 feet MD.
- U-tube fluid sampler with casing mounted guns. The perforation interval for fluid sampling is from 2,491 feet MD to 2,501 feet MD.
- Fiber optic cable from the surface to a well depth of 8,234 feet MD.

All the above equipment was installed on the exterior of the production casing and cemented in place. There are no perforations through the casing.

Regards,

DocuSigned by:
Jonathan Rodriguez
D38AA01693BB4EE...

Jonathan Rodriguez
Completion Advisor
ExxonMobil

CONFIDENTIAL BUSINESS INFORMATION

docusign

Certificate Of Completion

Envelope Id: 28E2F290-FB72-40D0-AA8F-30274455EBC0
Status: Completed
Subject: Complete with Docusign: W2 Monitor Well Statement V2.pdf
Source Envelope:
Document Pages: 1
Signatures: 1
Envelope Originator:
Certificate Pages: 2
Initials: 0
WILLIAM Carr
AutoNav: Enabled
Address Redacted
EnvelopeId Stamping: Disabled
william.j.carr@exxonmobil.com
Time Zone: (UTC-06:00) Central Time (US & Canada)
IP Address: 136.228.238.182

Record Tracking

Status: Original
12/23/2024 2:53:49 PM
Holder: WILLIAM Carr
william.j.carr@exxonmobil.com
Location: DocuSign
Security Appliance Status: Connected
Pool: Main SecApp 1

Signer Events	Signature	Timestamp
Jonathan Rodriguez jonathan.a.rodriguez@exxonmobil.com ExxonMobil General Security Level: Email, Account Authentication (None)	DocuSigned by:  D38AA01693BB4EE... Signature Adoption: Pre-selected Style Using IP Address: 136.228.238.73	Sent: 12/23/2024 2:54:34 PM Viewed: 12/23/2024 2:55:37 PM Signed: 12/23/2024 2:55:47 PM

Electronic Record and Signature Disclosure:
Accepted: 7/12/2022 6:18:31 AM
ID: 24c3aed4-aea4-42d2-a30a-2d53609eb06c
Company Name: Exxon Mobil Corporation

In Person Signer Events	Signature	Timestamp

Editor Delivery Events	Status	Timestamp

Agent Delivery Events	Status	Timestamp

Intermediary Delivery Events	Status	Timestamp

Certified Delivery Events	Status	Timestamp

Carbon Copy Events	Status	Timestamp

Witness Events	Signature	Timestamp

Notary Events	Signature	Timestamp

Envelope Summary Events	Status	Timestamps
Envelope Sent	Hashed/Encrypted	12/23/2024 2:54:34 PM
Certified Delivered	Security Checked	12/23/2024 2:55:37 PM
Signing Complete	Security Checked	12/23/2024 2:55:47 PM
Completed	Security Checked	12/23/2024 2:55:47 PM

Payment Events	Status	Timestamps

Electronic Record and Signature Disclosure

CONFIDENTIAL BUSINESS INFORMATION

ELECTRONIC RECORD AND SIGNATURE DISCLOSURE ExxonMobil Global Services Company and ExxonMobil Affiliates (“ExxonMobil”) [1] may use the DocuSign service to collect signatures, endorsements, and approvals for corporate purposes. DocuSign may be used by ExxonMobil to conduct corporate business endorsements and approvals or to gather electronic signatures from 3rd parties for business purposes in accordance with local law and contracting guidelines. Please read the information below and if you can access this information electronically to your satisfaction and agree to these terms and conditions, please confirm your agreement by clicking the 'I agree' button.
Acknowledging your access and consent to receive materials electronically By checking the 'I agree' box, I confirm that:

- I can access and read this Electronic CONSENT TO ELECTRONIC RECEIPT OF ELECTRONIC RECORD AND SIGNATURE DISCLOSURES document; and
- I can print on paper the disclosure or save or send the disclosure to a place where I can print it, for future reference.
- I am authorized to do the specific type of work (approve, endorse, etc.) in the country where I am physically located when using DocuSign

Getting paper copies You will have the ability to download and print documents we send to you through the DocuSign system during and immediately after signing the document.
How to contact Exxon Mobil Corporation: For email address changes or if you have questions about a document you receive please contact the sending ExxonMobil Business organization.
[1] ExxonMobil and/or ExxonMobil Affiliates mean (a) Exxon Mobil Corporation or any parent of Exxon Mobil Corporation, (b) any company or partnership in which Exxon Mobil Corporation or any parent of Exxon Mobil Corporation now or hereafter, directly or indirectly (1) owns or (2) controls, more than fifty per cent (50%) of the ownership interest having the right to vote or appoint its directors or functional equivalents ("Affiliated Company") and (c) any joint venture in which Exxon Mobil Corporations, any parent of Exxon Mobil Corporation or an Affiliated Company has day to day operational control. Note, nothing contained herein is intended to override the corporate separateness of affiliated companies. Working relationships discussed in this material do not necessarily represent a reporting connection, but may reflect a functional guidance, stewardship, or service relationship. Where shareholder consideration of a local entity matter is contemplated by this material, responsibility for action remains with the local entity. All actions contemplated herein are subject to observance of corporate separateness principles and other requirements of applicable laws and contractual arrangements.

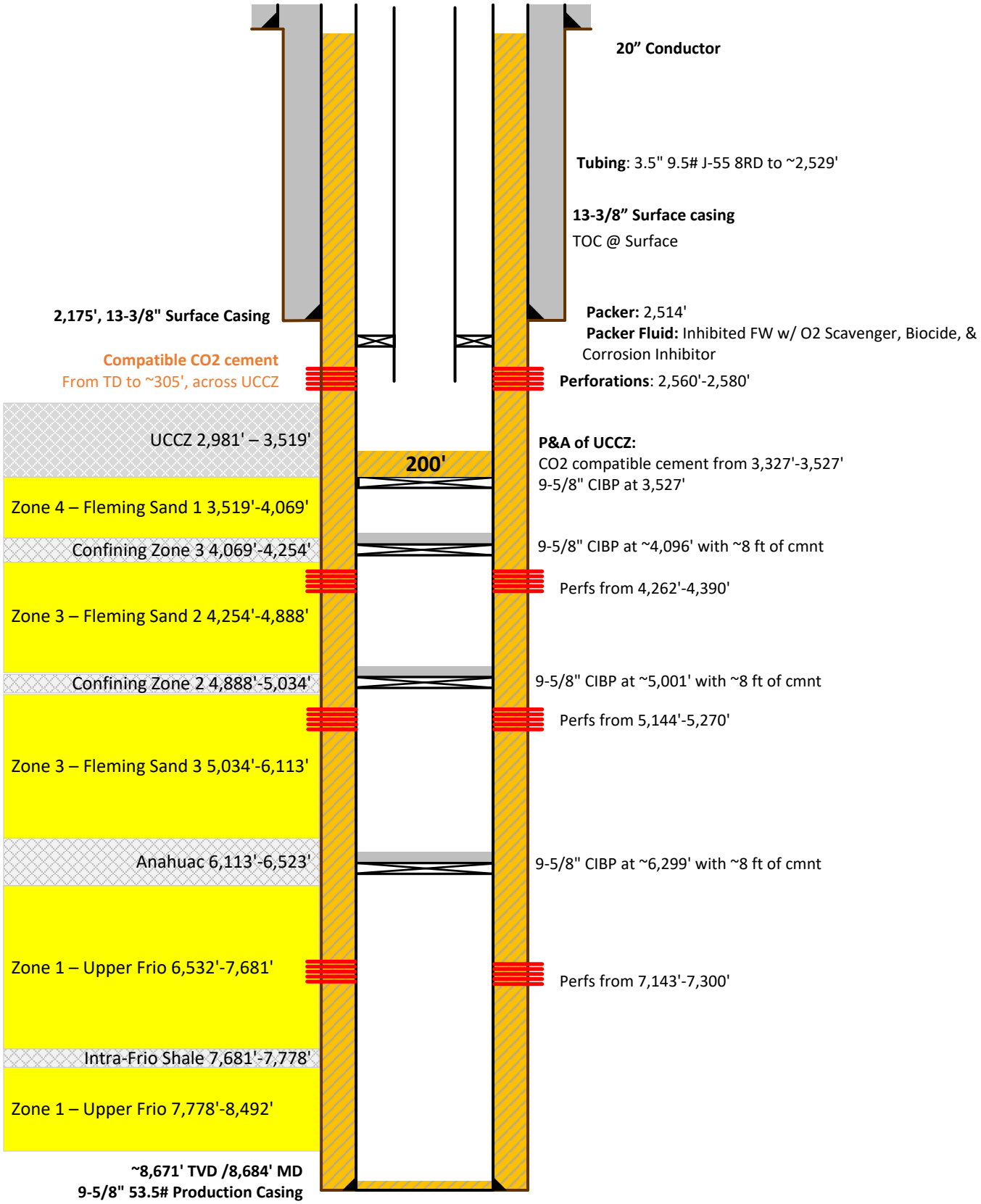
CONFIDENTIAL BUSINESS INFORMATION

4224532908 Bead Farm Co. #1 (Above-Zone Monitoring Well No. 01)

CONFIDENTIAL BUSINESS INFORMATION

Rose CCS Project Bead Farm 1

Recompletion Schematic



CONFIDENTIAL BUSINESS INFORMATION

API No. 42-245-32908
Drilling Permit # 891726
SWR Exception

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

FORM W-1 07/2004

Permit Status: Approved

1. RRC Operator No.: 101256

2. Operator's Name (as shown on form P-5, Organization Report): EXXONMOBIL LOW C SOL ON STOR LLC

3. Operator Address (include street, city, state, zip):
ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

4. Lease Name: BEAD FARM CO.

5. Well No.: 1

GENERAL INFORMATION

6. Purpose of filing (mark ALL appropriate boxes): [X] New Drill [ ] Recompletion [ ] Reclass [ ] Field Transfer [ ] Re-Enter [ ] Amended [ ] Amended as Drilled (BHL) (Also File Form W-1D)

7. Wellbore Profile (mark ALL appropriate boxes): [X] Vertical [ ] Horizontal (Also File Form W-1H) [ ] Directional (Also File Form W-1D) [ ] Sidetrack

8. Total Depth: 8700

9. Do you have the right to develop the minerals under any right-of-way ? [X] Yes [ ] No

10. Is this well subject to Statewide Rule 36 (hydrogen sulfide area)? [ ] Yes [X] No

SURFACE LOCATION AND ACREAGE INFORMATION

11. RRC District No.: 03

12. County: JEFFERSON

13. Surface Location [X] Land [ ] Bay/Estuary [ ] Inland Waterway [ ] Offshore

14. This well is to be located 18 miles in a E direction from Cleveland which is the nearest town in the county of the well site.

15. Section: 41

16. Block:

17. Survey: T&NO RR CO

18. Abstract No.: A-266

19. Distance to nearest lease line: ft.

20. Number of contiguous acres in lease, pooled unit, or unitized tract: 642.2

21. Lease Perpendiculars: 1475 ft from the N line and 1817 ft from the W line.

22. Survey Perpendiculars: 1475 ft from the N line and 1817 ft from the W line.

23. Is this a pooled unit? [ ] Yes [X] No

24. Unitization Docket No:

25. Are you applying for Substandard Acreage Field? [ ] Yes (attach Form W-1A) [X] No

FIELD INFORMATION List all fields of anticipated completion including Wildcat. List one zone per line.

26. RRC District No.	27. Field No.	28. Field Name (exactly as shown in RRC records)	29. Well Type	30. Completion Depth	31. Distance to Nearest Well in this Reservoir	32. Number of Wells on this lease in this Reservoir
03	00006001	WILDCAT	Exploratory Test Well	8495	0.00	1

BOTTOMHOLE LOCATION INFORMATION is required for DIRECTIONAL, HORIZONTAL, AND AMENDED AS DRILLED PERMIT APPLICATIONS

Remarks
See W1 Comments attached

Certificate:
I certify that information stated in this application is true and complete, to the best of my knowledge.

Leslie Sincler — Name of filer
Jun 28, 2023 — Date submitted

(832)654-3475 — Phone
leslie@exxonmobil.com — E-mail Address (OPTIONAL)

RRC Use Only Data Validation Time Stamp: Mar 27, 2025 2:09 PM(Current Version)

CONFIDENTIAL BUSINESS INFORMATION

Permit Status: Approved

The RRC has not approved this application. Duplication or distribution of information is at the user's own risk.

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

APPLICATION FOR PERMIT TO DRILL, RECOMPLETE, OR RE-ENTER

This facsimile W-1 was generated electronically from data submitted to the RRC.
A certification of the automated data is available in the RRC's Austin office.

W-1 Comments

Permit # 891726

Approved Date: Aug 18, 2023

[FILER Jun 28, 2023 2:17 PM]: Proposed well is an exploratory test well. Well completions tests are planned to include up to an estimated 21,000 bbls of salt and water solution. Tests will be completed at three intervals over the course of up to an estimated three weeks.; [RRC STAFF Jun 29, 2023 5:43 PM]: W-1 coordinates changed to match plat.; [RRC STAFF Jun 30, 2023 4:13 PM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Jun 30, 2023 4:14 PM]: W-1 is being held until it is determined if Financial Assurance is needed for carbon capture.; [RRC STAFF Jul 6, 2023 10:40 AM]: There have been problems identified with this permit (see problem letter attachment). Notification sent.; [RRC STAFF Aug 17, 2023 2:09 PM]: Financial Assurance has been submitted and is currently being processed. The status is currently Pending, when it updates to Approved, the W-1 can be approved.; [RRC STAFF Aug 18, 2023 6:26 PM]: Financial Assurance has been updated to approved.; [RRC STAFF Aug 18, 2023 6:26 PM]: Problems identified with this permit are resolved.

CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

***NOTIFICATION**

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
891726	Aug 18, 2023	* 03
API NUMBER	FORM W-1 RECEIVED	COUNTY
42-245-32908	Jun 28, 2023	JEFFERSON
TYPE OF OPERATION	WELLBORE PROFILE(S)	ACRES
NEW DRILL	Vertical	642.2

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389-0000

NOTICE
This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.
District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM CO.	1
LOCATION	TOTAL DEPTH
18 miles E direction from CLEVELAND	8700

Section, Block and/or Survey

SECTION 41 BLOCK ABSTRACT 266

SURVEY T&NO RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1475 ft. N 1817 ft. W	ft.
DISTANCE TO LEASE LINES	DISTANCE TO NEAREST WELL ON LEASE
1475 ft. N 1817 ft. W	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	642.20	8,495	1	03
BEAD FARM CO.			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
481 WINSCOTT ROAD, Ste. 200 • BENBROOK, TEXAS 76126
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
TEXAS FIRM REGISTRATION NO. 10042504
WWW.TOPOGRAPHIC.COM

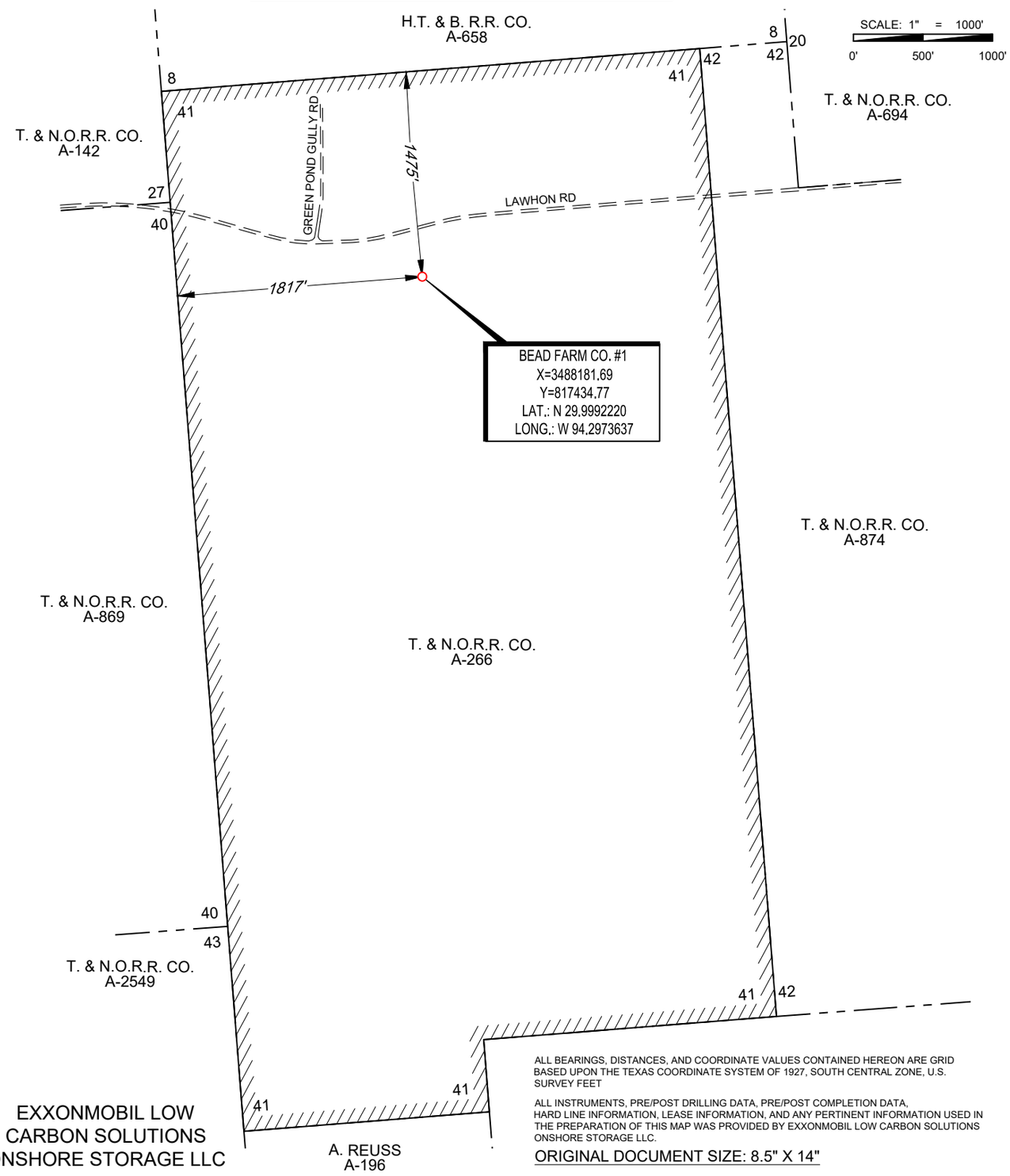
JEFFERSON COUNTY, TEXAS

SECTION 41, T. & N.O.R.R. CO. SURVEY, A-266

LEGEND

- UNIT/LEASE BOUNDARY
- SECTION LINE
- ROAD
- PROPOSED WELL

UNIT/LEASE	SURVEY
S.H.L. 1817' FWL, 1475' FNL	T. & N.O.R.R. CO., A-266



EXXONMOBIL LOW CARBON SOLUTIONS ONSHORE STORAGE LLC

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE TEXAS COORDINATE SYSTEM OF 1927, SOUTH CENTRAL ZONE, U.S. SURVEY FEET

ALL INSTRUMENTS, PRE/POST DRILLING DATA, PRE/POST COMPLETION DATA, HARD LINE INFORMATION, LEASE INFORMATION, AND ANY PERTINENT INFORMATION USED IN THE PREPARATION OF THIS MAP WAS PROVIDED BY EXXONMOBIL LOW CARBON SOLUTIONS ONSHORE STORAGE LLC.

ORIGINAL DOCUMENT SIZE: 8.5" X 14"

LEASE NAME & WELL NO.: BEAD FARM CO. #1 LEASE ACREAGE: CALLED 642.2 DATE OF SURVEY: APRIL 21, 2023

LOCATED: ±12 MILES SOUTHWEST OF BEAUMONT, TX GROUND ELEVATION: 23'

BEST ACCESSIBILITY TO LOCATION: ±0.02 MILES TO A POINT ±225 FEET NORTHWEST FROM LOCATION

DISTANCE & DIRECTION
FROM HWY JCT. OR TOWN: FROM THE INTERSECTION OF LAWHON RD AND GREEN POND GULLY RD, HEAD EAST

ON LAWHON RD 650 FEET, TURNING SOUTH, HEAD 350 FEET TO SURFACE LOCATION

STATE OF TEXAS
REGISTERED
JEFFREY N. LUEDERS
6512
PROFESSIONAL
LAND SURVEYOR

CERTIFICATION:

I, JEFFREY N. LUEDERS, A REGISTERED PROFESSIONAL LAND SURVEYOR, AND AN AUTHORIZED AGENT OF TOPOGRAPHIC LAND SURVEYORS, DO HEREBY CERTIFY THAT THE ABOVE DESCRIBED "PRE-CONSTRUCTION" PROPOSED WELL LOCATION WAS SURVEYED AND STAKED ON THE GROUND AS SHOWN HEREIN.

FILE NAME LO_TX245_BEAD_FARM_CO_1
DRH

DATE CERTIFIED: 05/16/2023 TEXAS REG. NO. 6512

CONFIDENTIAL BUSINESS INFORMATION

GROUNDWATER PROTECTION DETERMINATION

Form GW-2

Groundwater Advisory Unit

Date Issued:	19 June 2023	**GAU Number:**	368887

Attention:	EXXONMOBIL LOW C SOL ON ATTN EDWARD E GRAHAM SPRING, TX 77389	**API Number:**	
		County:	JEFFERSON
		Lease Name:	BEAD FARM CO
		Lease Number:	
Operator No.:	101256	**Well Number:**	1
		Total Vertical	8500
		Latitude:	29.999222
		Longitude:	-94.297364
		Datum:	NAD27

Purpose: New Production Well

Location: Survey-T&NO RR CO; Abstract-266; Section-41

To protect usable-quality groundwater at this location, the Groundwater Advisory Unit of the Railroad Commission of Texas recommends:

Usable-quality water occurs from the land surface to a depth of 1100 feet. Moreover, the interval from the land surface to a depth of 700 feet contains water of superior quality which must be isolated from water in underlying beds.

Also, isolation to prevent migration must be effected at a depth of 600 feet.

This recommendation is applicable for all wells drilled in this Lease.

Please send a shallow GR/SP/RES log of this well when it is available.

Note: Unless stated otherwise, this recommendation is intended to apply to all wells drilled within 200 feet of the subject well. Unless stated otherwise, this recommendation is for normal drilling, production, and plugging operations only.

This determination is based on information provided when the application was submitted on 06/15/2023. If the location information has changed, you must contact the Groundwater Advisory Unit, and submit a new application if necessary. If you have questions, please contact us at 512-463-2741 or gau@rrc.texas.gov.

Groundwater Advisory Unit, Oil and Gas Division

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

Form W-2

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Status: Approved
Date: 05/10/2024
Tracking No.: 307853

OIL WELL POTENTIAL TEST, COMPLETION OR RECOMPLETION REPORT,

OPERATOR INFORMATION

Operator EXXONMOBIL LOW C SOL ON STOR LLC **Operator** 101256
Operator ATTN EDWARD E GRAHAM 22777 SPRINGWOODS VILLAGE PKWY SPRING, TX 77389-0000

WELL INFORMATION

API 42-245-32908 **County:** JEFFERSON
Well No.: 1 **RRC District** 03
Lease BEAD FARM CO. **Field** WILDCAT
RRC Lease 28125 **Field No.:** 00006001
Location Section: 41, Block: , Survey: T&NO RR CO, Abstract: 266

Latitude 29.999222 **Longitud** -94.297363
This well is 18 **miles in a** E
direction from CLEVELAND,
which is the nearest town in the

FILING INFORMATION

Purpose of Well Record Only
Type of New Well
Well Type: Shut-In Producer **Completion or Recompletion** 12/03/2023

Type of Permit	Date	Permit No.
Permit to Drill, Plug Back, or	08/18/2023	891726
Rule 37 Exception		
Fluid Injection		
O&G Waste Disposal		
Other:		

COMPLETION INFORMATION

Spud 10/15/2023 **Date of first production after rig** 12/03/2023
Date plug back, deepening, drilling operation 10/15/2023 **Date plug back, deepening, recompletion, drilling operation** 12/03/2023
Number of producing wells on this lease this field (reservoir) including this 0 **Distance to nearest well in lease & reservoir** 0.0
Total number of acres in 642.20 **Elevation** 23 GL
Total depth TVD 8664 **Total depth MD**
Plug back depth TVD 4087 **Plug back depth MD**
Was directional survey made other inclination (Form W- No **Rotation time within surface casing** 94.0
Is Cementing Affidavit (Form W-15) Yes
Recompletion or No **Multiple** No
Type(s) of electric or other log(s) Gamma Ray (MWD)
Electric Log Other Description:

Location of well, relative to nearest lease of lease on which this well is 1475.0 **Feet from the** North **Line and** 1817.0 **Feet from the** West **Line of the** BEAD FARM CO. **Lease.** **Off Lease :** No

FORMER FIELD (WITH RESERVOIR) & GAS ID OR OIL LEASE NO.

Field & Reservoir	Gas ID or Oil Lease	Well No.	Prior Service Type

PACKET: N/A

W2: N/A

FOR NEW DRILL OR RE-ENTRY, SURFACE CASING DEPTH DETERMINED BY:

GAU Groundwater Protection Determination		**Depth**	1100.0	**Date**	06/19/2023
SWR 13 Exception		**Depth**	2200.0		

INITIAL POTENTIAL TEST DATA FOR NEW COMPLETION OR RECOMPLETION

Date of		**Production**	
Number of hours	24	**Choke**	
Was swab used during this	No	**Oil produced prior to**	

PRODUCTION DURING TEST PERIOD:

Oil		**Gas**	
Gas - Oil	0	**Flowing Tubing**	
Water			

CALCULATED 24-HOUR RATE

Oil		**Gas**	
Oil Gravity - API - 60.:		**Casing**	
Water			

CASING RECORD

Ro	Type of Casing	Casing Size (in.)	Hole Size	Setting Depth	Multi - Stage Tool	Multi - Stage Shoe	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined By
2	Surface	13 3/8	17 1/2	2175			H	1470	3037.0	0	Circulated to Surface
3	Conductor	20	26	120			A	185	220.0	0	Circulated to Surface
4	Conventional Production	9 5/8	12 1/4	8656			H	1855	2893.0	353	Calculation

LINER RECORD

Ro	Liner Size	Hole Size	Liner Top	Liner Bottom	Cement Class	Cement Amoun	Slurry Volume (cu.	Top of Cement (ft.)	TOC Determined

N/A

TUBING RECORD

Ro	Size (in.)	Depth Size (ft.)	Packer Depth (ft.)/Type
			/

N/A

PRODUCING/INJECTION/DISPOSAL INTERVAL

Ro	Open hole?	From (ft.)	To (ft.)
		L	

N/A

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC.

Was hydraulic fracturing treatment No

Is well equipped with a downhole sleeve? No

If yes, actuation pressure

Production casing test pressure (PSIG)

Actual maximum pressure (PSIG) during hydraulic fracturing

fracturin

Has the hydraulic fracturing fluid disclosure been No

Ro	Type of Operation	Amount and Kind of Material Used	Depth Interval (ft.)

1	Cast Iron Bridge Plug	CAST IRON BRIDGE PLUG PLUS 3.4 CU FT CEMENT CLASS H	6290	6299
2	Cast Iron Bridge Plug	CAST IRON BRIDGE PLUG PLUS 3.4 CU FT CEMENT CLASS H	4992	5001
3	Cast Iron Bridge Plug	CAST IRON BRIDGE PLUG PLUS 3.4 CU FT CEMENT CLASS H	4087	4096

FORMATION RECORD

Formations	Encountere	Depth TVD	Depth MD	Is formation	Remarks
LAFAYETTE - DISPOSAL	No			No	
CAPROCK - DISPOSAL	No			No	
SPINDLETOP SALT DOME - DISPOSAL	No			No	
FANNETT SALT DOME - DISPOSAL	No			No	
BIG HILL SALT DOME - DISPOSAL	No			No	
PLEISTOCENE-LISSIE - DISPOSAL	No			No	
MIOCENE - DISPOSAL	Yes	3522.0	3520.0	Yes	LOGGED
FRIO - DISPOSAL	Yes	6527.0	6523.0	Yes	LOGGED
MARINULINA - DISPOSAL	No			No	
HETEROSTEGINA - DISPOSAL	Yes	6274.0	6270.0	Yes	LOGGED

Do the producing interval of this well produce H2S with a concentration in excess of 100 ppm No

Is the completion being downhole commingled No

REMARKS

THE WELL WAS PERFORATED, TESTED, AND TEMPORARILY ABANDONED. THIS IS A TEST WELL AND HAS NOT PRODUCED.

RRC REMARKS

PUBLIC COMMENTS:

[RRC Staff 2024-02-23 08:49:28.617] EXPLORATORY WELL ONLY

CASING RECORD :

NONE.

TUBING RECORD:

A STRATIGRAPHIC WELL UTILIZED INJECTIVITY TEST VIA CASING.

PRODUCING/INJECTION/DISPOSAL INTERVAL :

ACID, FRACTURE, CEMENT SQUEEZE, CAST IRON BRIDGE PLUG, RETAINER, ETC. :

PERFORATED BETWEEN X AND X - ALL ISOLATED WITH PLUGS AND CEMENT.

POTENTIAL TEST DATA:

OPERATOR'S CERTIFICATION			
Printed	Josh Calkin	**Title:**	
Telephone	(281) 702-5537	**Date**	04/22/2024

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

Form W-15
Rev. 08/2014

CEMENTING REPORT

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name:	Operator P-5 No.:
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson
Well No.: 1	API No.: 42 - 245 - 32908 Drilling Permit No.: 891726
Lease Name: Bead Farm Company	Lease No.:
Field Name: Wildcat	Field No.:

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☐ Surface ☐ Intermediate ☐ Liner ☒ Production

Drilled hole size (in.): 12-1/4"	Depth of drilled hole (ft.): 8,671 MD	Est. % wash-out or hole enlargement: 3%
Size of casing in O.D. (in.): 9-5/8"	Casing weight (lbs/ft) and grade: 53.5 L-80	No. of centralizers used: 52
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☑ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 8,658 ft	Top of liner (ft.):
		Setting depth liner (ft.):
Hrs. waiting on cement before drill-out: N/A	Calculated top of cement (ft.): 305	Cementing date: 11/8/2023

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	1855	H	45 SCR100	2893	8366
2					
3					
Total	1855			2893	8,366

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total					

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date	11/24/2023	11/27/2023	11/30/2023				
Size of hole or pipe (in.)	9.625"	9.625"	9.625"				
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)	n/a	n/a	n/a				
CIBP setting depth (ft.)	6299	5001	4096				
Amount of cement on top of CIBP (ft.)	8.25	8.25	8.25				
Sacks of cement used							
Slurry volume pumped (cu. ft.)	3.4	3.4	3.4				
Calculated top of plug (ft.)	6290.75	4992.75	4087.75				
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)	17	17	17				
Class/type of cement	H	H	H				
Perforate and squeeze (YES/NO)	No	No	No				

REMARKS

Patrick Hart

EXXON, BEAD FARM CO, #1, PRODUCTION

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

JEROD HACK, SERVICE SUPERVISOR	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	11/08/2023
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

Timothy L Greene	Well Operations Supv.		
Typed or printed name of operator's representative	Title	Signature	
4763 Oak Knoll Ln.	Montgomery TX 77316	281-732-1469	11/03/23
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing and Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. Slurry data: If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS

1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967

CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name: XOM Low Carbon Solutions	Operator P-5 No.: 101256
Cementer Name: Halliburton	Cementer P-5 No.: 347151

WELL INFORMATION

District No.: 3	County: Jefferson		
Well No.: 1	API No.: 42-245-32908	Drilling Permit No.: 891726	
Lease Name: Bend Farm Company	Lease No.:		
Field Name: Wildcat	Field No.:		

I. CASING CEMENTING DATA

Type of casing: ☐ Conductor ☒ Surface ☐ Intermediate ☐ Liner ☐ Production

Drilled hole size (in.): 17-1/2"	Depth of drilled hole (ft.): 2,185	Est. % wash-out or hole enlargement: [redacted]27%
Size of casing in O.D. (in.): 13-3/8"	Casing weight (lbs/ft) and grade: 54.5	No. of centralizers used: 18
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☑ YES ☐ NO If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 2,175	Top of liner (ft.): / Setting depth liner (ft.):
Hrs. waiting on cement before drill-out: 34	Calculated top of cement (ft.): 0	Cementing date: 10/18/2023

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1	1015	A	SEE REMARKS	2395	1359
2	455	H	SEE REMARKS	642	816
3					
Total	1470			3037	2175

II. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement shoe ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth shoe (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

III. CASING CEMENTING DATA

Type of casing: ☐ Surface ☐ Intermediate ☐ Production ☐ Tapered production ☐ Multi-stage cement/DV tool ☐ Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? ☐ YES ☐ NO		Setting depth tool (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu. ft.)	Height (ft.)
1					
2					
3					
Total	0			0	0

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS
SLURRY 1-ECONOCEM (TM) SLURRY 2-EXTENDACEM (TM)

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

ZACHARY HOWARD-SERVICE SUPERVISOR	Halliburton		
Name and title of cementer's representative	Cementing Company	Signature	
4720 Industrial	Bossier City, LA 71112	903-986-5096	10/18/2023
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data.

James A. Reavis	Drilling Eng.	
Typed or printed name of operator's representative	Title	Signature

22777 Springwood Village Pkwy	TX 77389	701-978-8939	4/3/2024
Address	City, State, Zip Code	Tel: Area Code Number	Date: mo. day yr.

Wellness 3 Room 3A.591

Instructions for Form W-15, Cementing Report

NOTICE: The Form W-15 must be submitted as an attachment to a Form G-1 (Gas Well Back Pressure Test, Completion or Recompletion Report, and Log), Form W-2 (Oil Well Potential Test, Completion or Recompletion Report, and Log), Form W-3 (Plugging Record), or Form W-4 (Application for Multiple Completion), any time cement is pumped in a wellbore.

A. **What to file:** An operator should file an original and one copy of the completed Form W-15 for each cementing company used on a well. The cementing of different casing strings on a well by one cementing company may be reported on one form.

The Form W-15 should be filed with the Form W-3, Plugging Record, unless the Form W-3 is signed by the cementing company representative. When reporting dry holes, operators must complete Form W-15, in addition to Form W-3, to show any casing cemented in the hole.

B. **How to file:** An oil and gas completion report and Form W-15 may be filed online using the Commission's Online System (https://webapps.rrc.state.tx.us/security/login.do) or a paper copy of the form may be mailed to the Commission in Austin (P.O. Box 12967, Austin, Texas 78711-2967).

C. **Surface casing:** An operator must set and cement sufficient surface casing to protect all usable-quality water strata, as defined by the Groundwater Advisory Unit in Austin. Sufficient cement shall be used to fill the annular space outside the casing from the shoe to the ground surface or to the bottom of the cellar. Before drilling a well, an operator must obtain a letter from the Groundwater Advisory Unit stating the protection depth. Surface casing should not be set deeper than 200 feet below the specified depth without prior approval from the Commission.

To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

D. **Estimated % wash-out:** If the estimated % wash-out is less than 20% (or 30% along the Gulf Coast), provide supporting documentation such as a caliper log to show how the estimated % wash-out was obtained.

E. **Multi-stage cement:** An operator must report the multi-stage cement shoe in II. Casing Cementing Data section by selecting the type of casing and Multi-stage cement shoe. The operator must report the multi-stage cement tool in III. Casing Cementing Data section by selecting the type of casing and Multi-stage cement/DV tool.

F. **Multiple parallel strings:** An operator should file the Form W-15 as an attachment to the Form W-4, Application for Multiple Completion. An operator may be required to submit multiple Form W-15s to show all data for multiple parallel strings.

G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
1701 N. Congress
P.O. Box 12967
Austin, Texas 78701-2967
CEMENTING REPORT

Form W-15
Rev. 08/2014

Cementer: Fill in shaded areas.
Operator: Fill in other items.

OPERATOR INFORMATION

Operator Name:	~~Byrd Oilfield Services~~ XOM Low Carb Solutions	Operator P-5 No.:	101256
Cementer Name:	Cudd Pumping Services	Cementer P-5 No.:	191917

WELL INFORMATION

District No.:	3	County:	Jefferson
Well No.:	1	API No.:	42-245-32708 Drilling Permit No.: 791726
Lease Name:	Bead Farm Company	Lease No.:	
Field Name:	Wildcat	Field No.:	

I CASING CEMENTING DATA

Type of casing: [X] Conductor [ ] Surface [ ] Intermediate [ ] Liner [ ] Production

Drilled hole size (in.): 26	Depth of drilled hole (ft.): 120	Est. % wash-out or hole enlargement:	
Size of casing in O.D. (in.): 20	Casing weight (lbs/ft) and grade: 78.6 ppf X-52	No. of centralizers used:	
Was cement circulated to ground surface (or bottom of cellar) outside casing? [X] Yes [ ] No If no for surface casing, explain in Remarks.	Setting depth shoe (ft.): 120	Top of liner (ft.):	Setting depth liner (ft.):
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.): 0	Cementing date: 9/11/2023	

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu.ft.)	Height (ft.)
1	185	A	1% SA001	220.0	145
2					
3					
Total	185			220.0	145

II CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement shoe [ ] Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] Yes [ ] No	Setting depth tool (ft.):	
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu.ft.)	Height (ft.)
1					
2					
3					
Total					

III CASING CEMENTING DATA

Type of casing: [ ] Surface [ ] Intermediate [ ] Production [ ] Tapered production [ ] Multi-stage cement/DV tool [ ] Multiple parallel strings

Drilled hole size (in.):	Depth of drilled hole (ft.):	Est. % wash-out or hole enlargement:
Size of casing in O.D. (in.):	Casing weight (lbs/ft) and grade:	No. of centralizers used:
Tapered string drilled hole size (in.) Upper: Lower:	Tapered string depth of drilled hole (ft.) Upper: Lower:	
Tapered string size of casing in O.D. (in.) Upper: Lower:	Tapered string casing weight(lbs/ft) and grade Upper: Lower:	Tapered string no. of centralizers used Upper: Lower:
Was cement circulated to ground surface (or bottom of cellar) outside casing? [ ] Yes [ ] No	Setting depth tool (ft.):	
Hrs. waiting on cement before drill-out:	Calculated top of cement (ft.):	Cementing date:

SLURRY

Slurry No.	No. of Sacks	Class	Additives	Volume (cu.ft.)	Height (ft.)
1					
2					
3					
Total					

CONFIDENTIAL BUSINESS INFORMATION

CEMENTING TO SQUEEZE, PLUG BACK OR PLUG AND ABANDON							
	PLUG #1	PLUG #2	PLUG #3	PLUG #4	PLUG #5	PLUG #6	PLUG #7
Cementing Date							
Size of hole or pipe (in.)							
Depth to bottom of tubing or drill pipe (ft.)							
Cement retainer setting depth (ft.)							
CIBP setting depth (ft.)							
Amount of cement on top of CIBP (ft.)							
Sacks of cement used							
Slurry volume pumped (cu. ft.)							
Calculated top of plug (ft.)							
Measured top of plug, if tagged (ft.)							
Slurry weight (lbs/gal)							
Class/type of cement							
Perforate and squeeze (YES/NO)							

REMARKS

CEMENTER'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that the cementing of casing and/or the placing of cement plugs in this well as shown in the report was performed by me or under my supervision, and that the cementing data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers cementing data only.

Artemio Rivera Service Supervisor	Cudd Pumping Services	
Name and title of cementer's representative	Cementing Company	Signature

1434 CR 422	Pleasanton	TX	78064	1830-254-4200	September 11, 2023
Address	City,	State,	Zip Code	Tel: Area Code Number	Date: mo. day yr.

OPERATOR'S CERTIFICATE: I declare under penalties prescribed in Sec. 91.143, Texas Natural Resources Code, that I am authorized to make this certification, that I have knowledge of the well data and information presented in this report, and that data and facts presented on both sides of this form are true, correct, and complete, to the best of my knowledge. This certification covers all well data

James Harvey	Operations Supt.	
Type or printed name of operator's representative	Title	Signature

				512 749 8222	9/11/23
Address	City,	State,	Zip Code	Tel: Area Code Number	Date: mo. day yr.

Instructions for Form W-15, Cementing Report

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To plug and abandon a well, operators must use only cementers approved by the Commission's Director of Field Operations in accordance with SWR 14 (http://info.sos.state.tx.us/pls/pub/readtac$ext.TacPage?sl=R&app=9&p_dir=&p_rloc=&p_tloc=&p_ploc=&pg=1&p_tac=&ti=16&pt=1&ch=3&rl=14). Cementing companies, service companies, or operators can qualify as approved cementers by demonstrating that they are able to mix and pump cement in compliance with Commission rules and regulations.

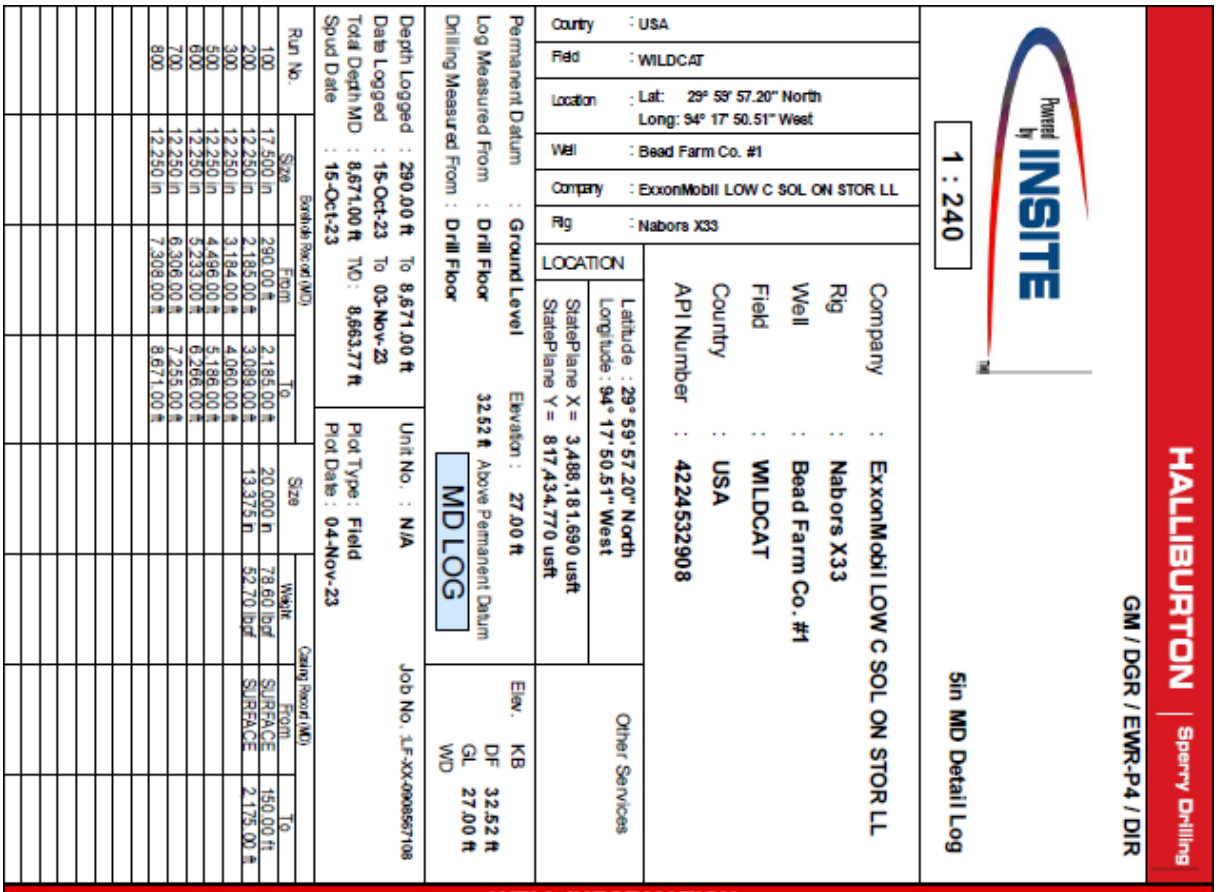
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G. **Slurry data:** If cement job exceeds three slurries, continue the list of slurries in the Slurry table in the subsequent Casing Cementing Data box.

CONFIDENTIAL BUSINESS INFORMATION



WELL INFORMATION

MWD Run Number	100	200	300	400	500
Date run completed	16-Oct-23	20-Oct-23	23-Oct-23	25-Oct-23	27-Oct-23
Rig Bit Number	100	200	300	400	500
Bit Size (in)	17.500	12.250	12.250	12.250	12.250
Tool Nominal OD (in)	8.000	8.000	8.000	8.000	8.000
Log Start Depth (MD, ft)	152.00	2,185.00	3,200.00	4,122.00	4,496.00
Log End Depth (MD, ft)	2,185.00	3,089.00	4,060.00	4,460.00	5,186.00
Drill or Wipe	Drill	Drill	Drill	Drill	Drill
Drill/Wipe Start Date and Time	15-Oct-23 09:45	20-Oct-23 06:40	23-Oct-23 02:15	24-Oct-23 22:21	26-Oct-23 16:09
Drill/Wipe End Date and Time	16-Oct-23 03:55	20-Oct-23 15:15	23-Oct-23 12:24	25-Oct-23 02:14	27-Oct-23 05:09
Min Inc (deg) @ Depth (MD, ft)	0.19 @385.00	2.41 @2,263.00	2.29 @3,868.00	1.37 @4,344.00	1.66 @4,527.00
Max Inc (deg) @ Depth (MD, ft)	2.24 @2,113.00	3.81 @3,015.00	4.09 @3,112.00	2.65 @4,056.00	2.54 @5,110.00
Bit TFA(in2) / Bit Type	0.91 / PDC	0.91 / PDC	0.91 / PDC	0.91 / PDC	0.91 / PDC
Flow Rate (gpm)	700.00	600.00	605.00	605.00	600.00
Max AV (fpm) / CV (fpm) @ MWD	80.0 / 85.6	175.0 / 172.0	175.0 / 180.0	195.3 / 0.0	171.3 / 180.0
Fluid Type	Native/Spud Mud	Mineral Oil Bas	Mineral Oil Bas	Mineral Oil Bas	Mineral Oil Bas
Density (ppg) / Viscosity (spqt)	9.00 / 33.00	9.10 / 48.00	10.00 / 72.00	10.50 / 67.00	10.50 / 59.00
Filtrate CL (ppm)	1,100.00	32,500.00	75,000.00	74,000.00	69,000.00
pH / API Filtrate (mptm)	8.00 / 14	N/A / 0	N/A / 0	N/A / 0	N/A / 0
PV (cP) / YP (lhf2)	10 / 5.00	9 / 7.00	23 / 17.00	23 / 18.00	21 / 24.00
% Solids / % Sand	4.9 / .01	7.2 / 0	9.3 / 0	10.5 / 0	11.8 / 0
% Oil / Oil:Water Ratio	0 / 0:100	74.73 / 75:25	53 / 60:40	52 / 60:40	54 / 64:36
Rm @ Measured Temp (degF)	0.100 @70.00	N/A@N/A	N/A@N/A	N/A@N/A	N/A@N/A
Rmf @ Measured Temp (degF)	0.10 @70.00	N/A@N/A	N/A@N/A	N/A@N/A	N/A@N/A
Rmc @ Measured Temp (degF)	0.100 @70.00	N/A@N/A	N/A@N/A	N/A@N/A	N/A@N/A
Max Tool Temp (degF) / Source	102.20 / TM	130.82 / HDM	137.88 / HDM	141.41 / HDM	152.00 / HDM
Rm @ Max Tool Temp (degF)	0.0705 @ 102.20	N/A @ 130.82	N/A @ 137.88	N/A @ 141.41	N/A @ 152.00
Lead MWD Engineer	Alex Killgore	Alex Killgore	Alex Killgore	Alex Killgore	Jason Anderson
Customer Representative	N/A	N/A	N/A	N/A	N/A

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
Oil and Gas Division
Tracking No.: 307853

ELECTRIC LOG STATUS REPORT

This facsimile L-1 was generated electronically from data submitted to the RRC.

FORM L-1

Instructions

When to File Form L-1:
- with Forms G-1, W-2, and GT-1 for new and deepened gas, oil, and geothermal wells
- with Form W-3 for plugged dry holes
- when sending in a log which was held under a request for confidentiality and the period for confidentiality has not yet expired.

When is Form L-1 NOT required:
- with Forms W-2, G-1, and GT-1 filed for injection wells, disposal wells, water supply wells, service wells, re-test wells, re-classifications, and plugbacks of oil, gas or geothermal wells
- with Form W-3 for plugging of other than a dry hole

Where to File Form L-1:
- with the appropriate Commission district office

Filling out Form L-1:
- Section I and the signature section must be filled out for all wells
- complete only the appropriate part of Section II

Type of log required:
- any wireline survey run for the purpose of obtaining lithology, porosity, or resistivity information
- no more than one such log is required but it must be of the subject well
- if such log is NOT run on the subject well, do NOT substitute any other type of log; just select Section II, Part A below

SECTION I. IDENTIFICATION

Operator Name: EXXONMOBIL LOW C SOL ON STOR LLC	District No. 03	Completion Date: 12/03/2023
Field Name WILDCAT	Drilling Permit No. 891726	
Lease Name BEAD FARM CO.	Lease/ID No. 28125	Well No. 1
County JEFFERSON	API No. 42- 245-32908	

SECTION II. LOG STATUS (Complete either A or B)

☐ A. BASIC ELECTRIC LOG NOT RUN

☒ B. BASIC ELECTRIC LOG RUN. (Select one)

☒ 1. Confidentiality is requested and a copy of the header for each log that has been run on the well is attached.

☐ 2. Confidentiality already granted on basic electric log covering this interval (applicable to deepened wells only).

☐ 3. Basic electric log covering this interval already on file with Commission (applicable to deepened wells only).

☐ 4. Log attached to (select one):

☐ (a) Form L-1 (this form). If the company/lease name on log is different from that shown in Section I, please enter name on log here: _____

Check here if attached log is being submitted after being held confidential. ☐

☐ (b) Form P-7, Application for Discovery Allowable and New Field Designation.

☐ (c) Form W-4, Application for Multiple Completion:

Lease or ID No(s). _____

Well No(s). _____

Josh Calkin Signature	Title
EXXONMOBIL LOW C SOL ON STOR LLC Name (print)	(281) 702-5537 Phone 02/08/2024 Date

-FOR RAILROAD COMMISSION USE ONLY-

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON

4607 HWY 90 EAST • BROUSSARD, LA 70518

PHONE 337 837 3061 • FAX 337 837 4400

Jefferson County,
State of Texas

I, **Coy Lorraine,** certify that: I am employed by Halliburton Energy Service and that I did on the day(s) of **October 15, 2023 to November 3, 2023** conduct or supervise the taking of Directional Surveys as follow:

- **210' to a depth of 8598' MWD surveys performed by Sperry Drilling MWD**
- **Final survey is projected to a total depth of 8671'**

I certify that the data is true, correct, complete and within the limitations of the tool as set forth by Halliburton Energy Services. I further certify that I am authorized and qualified to make this report, that this survey was conducted at the request of **EXXONMOBIL LOW C SOL ON STOR LLC** for the **BEAD FARM CO. 1** in **Jefferson County, TX,** and that I have reviewed this report and find that it conforms to the principles and procedures set forth by Halliburton Energy Service for quality well surveying.

Coy Lorraine

Coy Lorraine, M/LWD Service Quality

CONFIDENTIAL BUSINESS INFORMATION

HALLIBURTON
4607 HWY 90 EAST • BROUSSARD, LA 70518
PHONE 337 837 3061 • FAX 337 837 4400

November 9, 2023

Railroad Commission of Texas
Oil and Gas Division
P.O. Box 12967
Capital Station
Austin, TX 78711

Re: EXXONMOBIL LOW C SOL ON STOR LLC
R.R.C. Operator No. 101256
BEAD FARM CO. 1
Permit No. 891726
Jefferson County, TX
API # 42-245-32908

Attention: Ms. Pam Johns

Enclosed, please find one copy of the survey performed on the above referenced well by Halliburton Energy Services, Inc. Operator #347-151.

Other information required by your office is as follows:

Name & Title of Surveyor	-	Coy Lorraine, M/LWD Service Quality
Drainhole Number	-	Original
Surveyed Depths	-	210' – 8598' MWD Surveys performed by Sperry Drilling
Dates Performed	-	October 15, 2023 to November 3, 2023
Type of Survey	-	MWD

A certified plat on which the bottom hole location is oriented both to the surface location and to the lease lines (or unit lines in case of pooling) is attached to the survey report. If any other information is required, please contact the undersigned at the listed e-mail address.

Respectfully,

Kristen
Log Analyst
Kristen.Killen@Halliburton.com
Halliburton / Sperry Drilling

Enclosures
RE: LA-MM 908567108

CONFIDENTIAL BUSINESS INFORMATION

ExxonMobil

Jefferson County, Tx
Rose Prospect CCS
Bead Farm Co. #1

001 ST00BP00

Design: 001 ST00BP00

Sperry Drilling Services

Geodetic Report

15 November, 2023

Well Coordinates: 817,434.77 N, 3,488,181.69 E (29° 59' 57.20" N, 094° 17' 50.51" W)
Ground Level: 27.00 usft

Local Coordinate Origin:	Centered on Well Bead Farm Co. #1
Viewing Datum:	(32.52') Nabors X-33 @ 59.52usft (Rig on Loc)
TVDs to System:	N
North Reference:	Grid
Unit System:	API US Survey Feet

Version: 5000.17 Build: 02

HALLIBURTON

Design Report for Bead Farm Co. #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	29° 59' 57.199 N	94° 17' 50.509 W	817,434.77	3,488,181.69
210.00	0.37	164.70	210.00	-0.65	0.18	29° 59' 57.193 N	94° 17' 50.508 W	817,434.12	3,488,181.87
303.00	0.22	187.45	303.00	-1.12	0.24	29° 59' 57.188 N	94° 17' 50.507 W	817,433.65	3,488,181.92
385.00	0.19	234.94	385.00	-1.35	0.10	29° 59' 57.186 N	94° 17' 50.509 W	817,433.42	3,488,181.79
576.00	0.29	216.67	576.00	-1.92	-0.44	29° 59' 57.180 N	94° 17' 50.515 W	817,432.85	3,488,181.24
757.00	0.56	181.75	756.99	-3.18	-0.75	29° 59' 57.168 N	94° 17' 50.519 W	817,431.59	3,488,180.94
854.00	0.34	176.13	853.99	-3.94	-0.74	29° 59' 57.161 N	94° 17' 50.520 W	817,430.83	3,488,180.95
945.00	0.82	187.51	944.98	-4.85	-0.81	29° 59' 57.152 N	94° 17' 50.521 W	817,429.92	3,488,180.88
1,133.00	0.74	222.83	1,132.97	-7.08	-1.81	29° 59' 57.130 N	94° 17' 50.533 W	817,427.69	3,488,179.88
1,326.00	0.83	215.12	1,325.95	-9.13	-3.46	29° 59' 57.110 N	94° 17' 50.553 W	817,425.64	3,488,178.23
1,512.00	0.59	246.91	1,511.93	-10.61	-5.12	29° 59' 57.096 N	94° 17' 50.572 W	817,424.16	3,488,176.57
1,705.00	0.67	215.11	1,704.92	-11.92	-6.68	29° 59' 57.084 N	94° 17' 50.591 W	817,422.85	3,488,175.01
1,888.00	1.47	212.95	1,887.89	-14.77	-8.57	29° 59' 57.057 N	94° 17' 50.613 W	817,420.00	3,488,173.12
2,083.00	1.95	211.16	2,082.80	-19.71	-11.65	29° 59' 57.009 N	94° 17' 50.651 W	817,415.06	3,488,170.04
2,113.00	2.24	206.92	2,112.78	-20.67	-12.18	29° 59' 57.000 N	94° 17' 50.657 W	817,414.10	3,488,169.51
2,263.00	2.41	205.91	2,262.66	-26.12	-14.88	29° 59' 56.947 N	94° 17' 50.690 W	817,408.65	3,488,166.81
2,360.00	2.56	206.53	2,359.57	-29.89	-16.74	29° 59' 56.910 N	94° 17' 50.713 W	817,404.88	3,488,164.95
2,457.00	2.68	206.96	2,456.47	-33.85	-18.74	29° 59' 56.872 N	94° 17' 50.738 W	817,400.92	3,488,162.95
2,553.00	2.83	208.18	2,552.36	-37.94	-20.87	29° 59' 56.832 N	94° 17' 50.764 W	817,396.83	3,488,160.81
2,649.00	3.06	209.03	2,648.23	-42.27	-23.24	29° 59' 56.790 N	94° 17' 50.793 W	817,392.50	3,488,158.45
2,828.00	3.68	211.90	2,826.92	-51.32	-28.59	29° 59' 56.703 N	94° 17' 50.858 W	817,383.45	3,488,153.10
2,922.00	3.78	213.09	2,920.72	-56.48	-31.88	29° 59' 56.653 N	94° 17' 50.897 W	817,378.29	3,488,149.81
3,015.00	3.81	212.63	3,013.51	-61.65	-35.22	29° 59' 56.603 N	94° 17' 50.938 W	817,373.12	3,488,146.47
3,112.00	4.09	213.44	3,110.28	-67.25	-38.86	29° 59' 56.549 N	94° 17' 50.982 W	817,367.52	3,488,142.83
3,206.00	3.90	216.01	3,204.06	-72.63	-42.59	29° 59' 56.498 N	94° 17' 51.026 W	817,362.14	3,488,139.10
3,302.00	3.43	220.91	3,299.86	-77.44	-46.39	29° 59' 56.452 N	94° 17' 51.072 W	817,357.33	3,488,135.30
3,396.00	3.08	227.55	3,393.71	-81.27	-50.09	29° 59' 56.415 N	94° 17' 51.116 W	817,353.50	3,488,131.60
3,493.00	2.63	238.21	3,490.59	-84.21	-53.91	29° 59' 56.388 N	94° 17' 51.160 W	817,350.56	3,488,127.78
3,681.00	3.03	236.09	3,678.36	-89.25	-61.70	29° 59' 56.341 N	94° 17' 51.251 W	817,345.52	3,488,119.99
3,773.00	3.07	236.39	3,770.23	-91.97	-65.77	29° 59' 56.316 N	94° 17' 51.299 W	817,342.80	3,488,115.92
3,868.00	2.29	245.55	3,865.12	-94.16	-69.61	29° 59' 56.295 N	94° 17' 51.343 W	817,340.61	3,488,112.08
3,961.00	2.48	247.19	3,958.04	-95.71	-73.16	29° 59' 56.282 N	94° 17' 51.384 W	817,339.06	3,488,108.53
3,987.00	2.58	248.05	3,984.02	-96.15	-74.22	29° 59' 56.278 N	94° 17' 51.397 W	817,338.62	3,488,107.47
4,056.00	2.65	247.41	4,052.95	-97.34	-77.13	29° 59' 56.267 N	94° 17' 51.430 W	817,337.43	3,488,104.56
4,152.00	2.07	251.51	4,148.86	-98.75	-80.83	29° 59' 56.255 N	94° 17' 51.473 W	817,336.02	3,488,100.86
4,246.00	1.39	261.83	4,242.82	-99.45	-83.56	29° 59' 56.249 N	94° 17' 51.504 W	817,335.32	3,488,098.12
4,344.00	1.37	260.60	4,340.79	-99.81	-85.90	29° 59' 56.246 N	94° 17' 51.531 W	817,334.96	3,488,095.79
4,386.00	1.49	262.00	4,382.78	-99.96	-86.93	29° 59' 56.245 N	94° 17' 51.543 W	817,334.81	3,488,094.76
4,434.00	1.58	261.67	4,430.76	-100.15	-88.21	29° 59' 56.244 N	94° 17' 51.557 W	817,334.62	3,488,093.48
4,527.00	1.66	264.88	4,523.73	-100.45	-90.82	29° 59' 56.242 N	94° 17' 51.587 W	817,334.32	3,488,090.87
4,624.00	1.76	264.59	4,620.68	-100.72	-93.70	29° 59' 56.240 N	94° 17' 51.620 W	817,334.05	3,488,087.99
4,718.00	1.77	268.05	4,714.64	-100.90	-96.59	29° 59' 56.240 N	94° 17' 51.653 W	817,333.87	3,488,085.10

Design Report for Bead Farm Co. #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude	Geographic Coordinates Longitude	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
4,813.00	1.97	270.81	4,809.59	-100.93	-99.69	29° 59' 56.240 N	94° 17' 51.688 W	817,333.84	3,488,082.00
4,908.00	2.18	273.99	4,904.52	-100.78	-103.12	29° 59' 56.243 N	94° 17' 51.727 W	817,333.99	3,488,078.57
5,001.00	2.30	275.15	4,997.45	-100.49	-106.74	29° 59' 56.248 N	94° 17' 51.768 W	817,334.28	3,488,074.94
5,097.00	2.45	274.72	5,093.37	-100.15	-110.71	29° 59' 56.253 N	94° 17' 51.813 W	817,334.62	3,488,070.98
5,110.00	2.54	275.19	5,106.36	-100.10	-111.27	29° 59' 56.253 N	94° 17' 51.820 W	817,334.67	3,488,070.42
5,283.00	2.66	275.59	5,279.18	-99.36	-119.08	29° 59' 56.264 N	94° 17' 51.908 W	817,335.41	3,488,062.60
5,378.00	2.82	274.34	5,374.07	-98.97	-123.61	29° 59' 56.269 N	94° 17' 51.959 W	817,335.80	3,488,058.08
5,472.00	1.88	278.50	5,467.99	-98.57	-127.44	29° 59' 56.275 N	94° 17' 52.003 W	817,336.20	3,488,054.25
5,569.00	1.35	294.54	5,564.95	-97.86	-130.05	29° 59' 56.283 N	94° 17' 52.032 W	817,336.91	3,488,051.64
5,661.00	1.18	310.30	5,656.93	-96.80	-131.76	29° 59' 56.294 N	94° 17' 52.051 W	817,337.97	3,488,049.93
5,755.00	1.30	312.59	5,750.91	-95.45	-133.28	29° 59' 56.308 N	94° 17' 52.068 W	817,339.32	3,488,048.40
5,948.00	1.22	7.87	5,943.87	-91.93	-134.61	29° 59' 56.343 N	94° 17' 52.081 W	817,342.84	3,488,047.07
6,040.00	1.46	19.21	6,035.84	-89.85	-134.09	29° 59' 56.364 N	94° 17' 52.074 W	817,344.92	3,488,047.59
6,135.00	1.92	28.48	6,130.80	-87.31	-132.94	29° 59' 56.388 N	94° 17' 52.060 W	817,347.46	3,488,048.75
6,150.66	1.94	29.14	6,146.45	-86.85	-132.68	29° 59' 56.393 N	94° 17' 52.057 W	817,347.92	3,488,049.01
6,228.00	2.06	32.16	6,223.75	-84.53	-131.30	29° 59' 56.415 N	94° 17' 52.040 W	817,350.24	3,488,050.38
6,325.00	2.10	31.84	6,320.68	-81.54	-129.44	29° 59' 56.444 N	94° 17' 52.017 W	817,353.23	3,488,052.25
6,422.00	2.19	29.54	6,417.62	-78.42	-127.59	29° 59' 56.474 N	94° 17' 51.995 W	817,356.35	3,488,054.10
6,513.00	2.21	30.12	6,508.55	-75.39	-125.85	29° 59' 56.504 N	94° 17' 51.974 W	817,359.38	3,488,055.84
6,515.93	2.21	30.12	6,511.48	-75.29	-125.79	29° 59' 56.504 N	94° 17' 51.973 W	817,359.48	3,488,055.89
6,607.00	2.23	29.44	6,602.48	-72.23	-124.04	29° 59' 56.534 N	94° 17' 51.952 W	817,362.54	3,488,057.65
6,701.00	2.29	28.78	6,696.40	-68.99	-122.24	29° 59' 56.565 N	94° 17' 51.930 W	817,365.78	3,488,059.45
6,796.00	2.36	28.05	6,791.33	-65.60	-120.41	29° 59' 56.598 N	94° 17' 51.908 W	817,369.17	3,488,061.28
6,892.00	2.46	31.47	6,887.24	-62.10	-118.40	29° 59' 56.632 N	94° 17' 51.883 W	817,372.67	3,488,063.29
6,985.00	2.60	29.02	6,980.15	-58.55	-116.33	29° 59' 56.666 N	94° 17' 51.858 W	817,376.22	3,488,065.35
7,079.00	2.71	27.06	7,074.05	-54.71	-114.29	29° 59' 56.704 N	94° 17' 51.833 W	817,380.06	3,488,067.40
7,141.00	2.79	26.24	7,135.98	-52.05	-112.96	29° 59' 56.729 N	94° 17' 51.817 W	817,382.72	3,488,068.73
7,266.00	2.85	26.77	7,260.83	-46.55	-110.21	29° 59' 56.783 N	94° 17' 51.783 W	817,388.22	3,488,071.48
7,363.00	2.99	25.96	7,357.70	-42.12	-108.02	29° 59' 56.826 N	94° 17' 51.756 W	817,392.65	3,488,073.67
7,459.00	3.01	26.60	7,453.57	-37.61	-105.79	29° 59' 56.869 N	94° 17' 51.729 W	817,397.16	3,488,075.90
7,555.00	2.97	25.12	7,549.44	-33.11	-103.61	29° 59' 56.913 N	94° 17' 51.702 W	817,401.66	3,488,078.08
7,651.00	3.04	23.94	7,645.31	-28.53	-101.52	29° 59' 56.957 N	94° 17' 51.676 W	817,406.24	3,488,080.17
7,748.00	3.11	23.38	7,742.17	-23.76	-99.43	29° 59' 57.004 N	94° 17' 51.650 W	817,411.01	3,488,082.26
7,837.00	3.11	21.92	7,831.04	-19.31	-97.57	29° 59' 57.047 N	94° 17' 51.627 W	817,415.46	3,488,084.12
7,931.00	3.13	22.72	7,924.90	-14.58	-95.63	29° 59' 57.093 N	94° 17' 51.603 W	817,420.19	3,488,086.06
8,026.00	3.28	22.62	8,019.75	-9.68	-93.58	29° 59' 57.141 N	94° 17' 51.577 W	817,425.09	3,488,088.11
8,123.00	3.29	23.34	8,116.59	-4.56	-91.41	29° 59' 57.190 N	94° 17' 51.550 W	817,430.21	3,488,090.28
8,215.00	3.21	22.93	8,208.44	0.24	-89.36	29° 59' 57.237 N	94° 17' 51.525 W	817,435.01	3,488,092.33
8,309.00	3.25	23.97	8,302.29	5.10	-87.26	29° 59' 57.284 N	94° 17' 51.499 W	817,439.87	3,488,094.43
8,404.00	3.23	26.22	8,397.14	9.96	-84.98	29° 59' 57.332 N	94° 17' 51.470 W	817,444.73	3,488,096.71
8,498.00	3.05	26.32	8,491.00	14.58	-82.70	29° 59' 57.376 N	94° 17' 51.442 W	817,449.35	3,488,098.99
8,528.63	3.02	25.60	8,521.59	16.03	-81.99	29° 59' 57.390 N	94° 17' 51.434 W	817,450.80	3,488,099.70

Design Report for Bead Farm Co. #1 - 001 ST00BP00

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Geographic Coordinates Latitude (usft)	Geographic Coordinates Longitude (usft)	UTM Coordinates Northing (usft)	UTM Coordinates Easting (usft)
8,598.00	2.96	23.92	8,590.86	19.32	-80.47	29° 59' 57.422 N	94° 17' 51.415 W	817,454.09	3,488,101.22
8,671.00	2.96	23.92	8,663.76	22.77	-78.94	29° 59' 57.456 N	94° 17' 51.396 W	817,457.54	3,488,102.74

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
User	No Target (Freehand)	0.00	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
210.00	2,113.00	01 HAL MWD (MagVarMS) 17 1/2" Hole 210' - 2113'	3_MWD+HRGM+MS
2,263.00	8,598.00	02 HAL MWD (MagVarMS) 12 1/4" Hole 2263' - 8598'	3_MWD+HRGM+MS

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
100.00	100.00	20" Conductor Casing	20	20

Design Targets

Shape	Target Name	TVD ()	Northing ()	Easting ()	+N/-S	+E/-W	Created	Updated

CONFIDENTIAL BUSINESS INFORMATION

Design Report for Bead Farm Co. #1 - 001 ST00BP00

Directional Difficulty Index

Average Dogleg over Survey:	0.24 °/100usft	Maximum Dogleg over Survey:	1.10 °/100usft at 2,113.00 usft
Net Tortousity applicable to Plans:	0.24 °/100usft	Directional Difficulty Index:	3.816

Audit Info

HALLIBURTON

ExxonMobil

Jefferson County, Tx

North Reference Sheet for Rose Prospect CCS - Bead Farm Co. #1 - 001 ST00BP00

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to Grid North Reference.

Vertical Depths are relative to (32.52') Nabors X-33 @ 59.52usft (Rig on Loc). Northing and Easting are relative to Bead Farm Co. #1

Coordinate System is US State Plane 1927 (Exact solution), Texas South Central 4204 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 99° 0' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:30° 17' 0.000 N°

False Easting: 2,000,000.00usft, False Northing: 0.00usft, Scale Reduction: 0.99993028

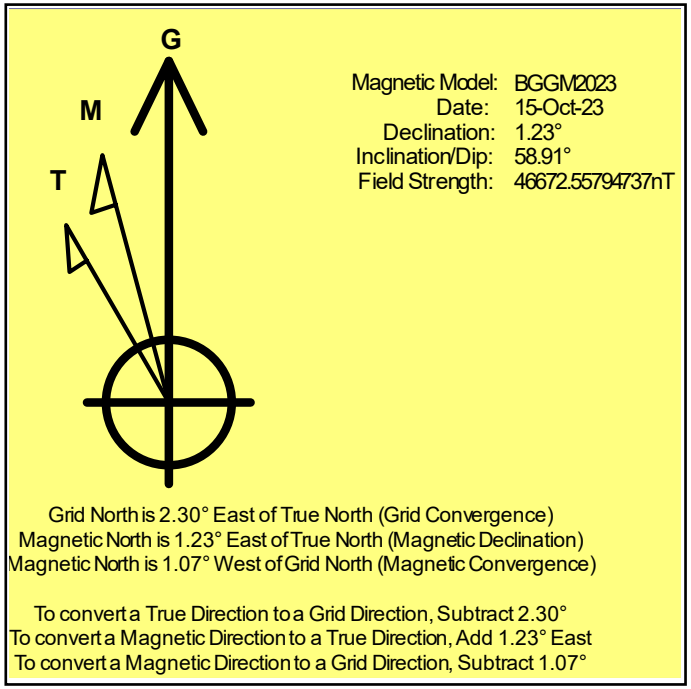
Grid Coordinates of Well: 817,434.77 usft N, 3,488,181.69 usft E

Geographical Coordinates of Well: 29° 59' 57.20" N, 094° 17' 50.51" W

Grid Convergence at Surface is: 2.30°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,671.00usft

the Bottom Hole Displacement is 82.16usft in the Direction of 286.09° (Grid).
Magnetic Convergence at surface is: 1.07° (15 October 2023, , BGGM2023)



CONFIDENTIAL BUSINESS INFORMATION

Railroad Commission of Texas

PERMIT TO DRILL, RE-COMPLETE, OR RE-ENTER ON REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

CONDITIONS AND INSTRUCTIONS

Permit Invalidation. It is the operator's responsibility to make sure that the permitted location complies with Commission density and spacing rules in effect on the spud date. The permit becomes invalid automatically if, because of a field rule change or the drilling of another well, the stated location is not in compliance with Commission field rules on the spud date. If this occurs, application for an exception to Statewide Rules 37 and 38 must be made and a special permit granted prior to spudding. Failure to do so may result in an allowable not being assigned and/or enforcement procedures being initiated.

Notice Requirements. Per H.B 630, signed May 8, 2007, the operator is required to provide notice to the surface owner no later than the 15th business day after the Commission issues a permit to drill. Please refer to subchapter Q Sec. 91.751-91.755 of the Texas Natural Resources Code for applicability.

Permit expiration. This permit expires two (2) years from the date of issuance shown on the original permit. The permit period will not be extended.

Drilling Permit Number. The drilling permit number shown on the permit MUST be given as a reference with any notification to the district (see below), correspondence, or application concerning this permit.

Rule 37 Exception Permits. This Statewide Rule 37 exception permit is granted under either provision Rule 37 (h)(2)(A) or 37(h)(2)(B). Be advised that a permit granted under Rule 37(h)(2)(A), notice of application, is subject to the General Rules of Practice and Procedures and if a protest is received under Section 1.3, "Filing of Documents," and/or Section 1.4, "Computation of Time," the permit may be deemed invalid.

Before Drilling

Fresh Water Sand Protection. The operator must set and cement sufficient surface casing to protect all usable-quality water, as defined by the Railroad Commission of Texas (RRC) Groundwater Advisory Unit (GWAU). Before drilling a well, the operator must obtain a letter from the Railroad Commission of Texas stating the depth to which water needs protection, Write: Railroad Commission of Texas, Groundwater Advisory Unit (GWAU), P.O. Box 12967, Austin, TX 78711-3087. File a copy of the letter with the appropriate district office.

Accessing the Well Site. If an OPERATOR, well equipment TRANSPORTER or WELL service provider must access the well site from a roadway on the state highway system (Interstate, U.S. Highway, State Highway, Farm-to-Market Road, Ranch-to-Market Road, etc.), an access permit is required from TxDOT. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

Water Transport to Well Site. If an operator intends to transport water to the well site through a temporary pipeline laid above ground on the state's right-of-way, an additional TxDOT permit is required. Permit applications are submitted to the respective TxDOT Area Office serving the county where the well is located.

***NOTIFICATION**

The operator is **REQUIRED** to notify the district office when setting surface casing, intermediate casing, and production casing, or when plugging a dry hole. The district office **MUST** also be notified if the operator intends to re-enter a plugged well or re-complete a well into a different regulatory field. Time requirements are given below. The drilling permit number **MUST** be given with such notifications.

During Drilling

Permit at Drilling Site. A copy of the Form W-1 Drilling Permit Application, the location plat, a copy of Statewide Rule 13 alternate surface casing setting depth approval from the district office, if applicable, and this drilling permit must be kept at the permitted well site throughout drilling operations.

***Notification of Setting Casing.** The operator MUST call in notification to the appropriate district office (phone number shown the on permit) a minimum of eight (8) hours prior to the setting of surface casing, intermediate casing, AND production casing. The individual giving notification MUST be able to advise the district office of the drilling permit number.

***Notification of Re-completion/Re-entry.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of eight (8) hours prior to the initiation of drilling or re-completion operations. The individual giving notification MUST be able to advise the district office of the drilling permit number.

Completion and Plugging Reports

Hydraulic Fracture Stimulation using Diesel Fuel: Most operators in Texas do not use diesel fuel in hydraulic fracturing fluids. Section 322 of the Energy Policy Act of 2005 amended the Underground Injection Control (UIC) portion of the federal Safe Drinking Water Act (42 USC 300h(d)) to define "underground Injection" to *EXCLUDE* " ...the underground injection of fluids or propping agents (*other than diesel fuels*) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities." (italic and underlining added.) Therefore, hydraulic fracturing may be subject to regulation under the federal UIC regulations if diesel fuel is injected or used as a propping agent. EPA defined "diesel fuel" using the following five (5) Chemical Abstract Service numbers: 68334-30-5 Primary Name: Fuels, diesel; 68476-34-6 Primary Name: Fuels, diesel, No. 2; 68476-30-2 Primary Name: Fuel oil No. 2; 68476-31-3 Primary Name: Fuel oil, No. 4; and 8008-20-6 Primary Name: Kerosene. As a result, an injection well permit would be required before performing hydraulic fracture stimulation using diesel fuel as defined by EPA on any well in Texas. Hydraulic fracture stimulation using diesel fuel as defined by EPA on a well in Texas without an injection well permit could result in enforcement action.

Producing Well. Statewide Rule 16 states that the operator of a well shall file with the Commission the appropriate completion report within ninety (90) days after completion of the well or within one hundred and fifty (150) days after the date on which the drilling operation is completed, whichever is earlier. Completion of the well in a field authorized by this permit voids the permit for all other fields included in the permit unless the operator indicates on the initial completion report that the well is to be a dual or multiple completion and promptly submits an application for multiple completion. All zones are required to be completed before the expiration date on the existing permit. Statewide Rule 40(d) requires that upon successful completion of a well in the same reservoir as any other well previously assigned the same acreage, proration plats and P-15s or P-16s (if required) or a lease plat and P-16 must be submitted with no double assignment of acreage unless authorized by rule.

Dry or Noncommercial Hole. Statewide Rule 14(b)(2) prohibits suspension of operations on each dry or non-commercial well without plugging unless the hole is cased and the casing is cemented in compliance with Commission rules. If properly cased, Statewide Rule 14(b)(2) requires that plugging operations must begin within a period of one (1) year after drilling or operations have ceased. Plugging operations must proceed with due diligence until completed. An extension to the one-year plugging requirement may be granted under the provisions stated in Statewide Rule 14(b)(2).

Intention to Plug. The operator must file a Form W-3A (Notice of Intention to Plug and Abandon) with the district office at least five (5) days prior to beginning plugging operations. If, however, a drilling rig is already at work on location and ready to begin plugging operations, the district director or the director's delegate may waive this requirement upon request, and verbally approve the proposed plugging procedures.

***Notification of Plugging a Dry Hole.** The operator MUST call in notification to the appropriate district office (phone number shown on permit) a minimum of four (4) hours prior to beginning plugging operations. The individual giving the notification MUST be able to advise the district office of the drilling permit number and all water protection depths for that location as stated in the Groundwater Advisory Unit letter.

DIRECT INQUIRIES TO: DRILLING PERMIT SECTION, OIL AND GAS DIVISION

PHONE
(512) 463-6751

MAIL:
PO Box 12967
Austin, Texas, 78711-2967

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

PERMIT TO DRILL, DEEPEN, PLUG BACK, OR RE-ENTER ON A REGULAR OR ADMINISTRATIVE EXCEPTION LOCATION

PERMIT NUMBER	DATE PERMIT ISSUED OR AMENDED	DISTRICT
891726	Aug 18, 2023	* 03
API NUMBER	FORM W-1 RECEIVED	COUNTY
42-245-32908	Jun 28, 2023	JEFFERSON
TYPE OF OPERATION	WELLBORE PROFILE(S)	ACRES
NEW DRILL	Vertical	642.2

OPERATOR 101256

EXXONMOBIL LOW C SOL ON STOR LLC

ATTN EDWARD E GRAHAM W1.2B.02
22777 SPRINGWOODS VILLAGE PKWY
SPRING, TX 77389

NOTICE
This permit and any allowable assigned may be revoked if payment for fee(s) submitted to the Commission is not honored.
District Office Telephone No:
(713) 869-5001

LEASE NAME	WELL NUMBER
BEAD FARM CO.	1
LOCATION	TOTAL DEPTH
18 miles E direction from CLEVELAND	8700

Section, Block and/or Survey

SECTION 41 BLOCK ABSTRACT 266

SURVEY T&NO RR CO

DISTANCE TO SURVEY LINES	DISTANCE TO NEAREST LEASE LINE
1475 ft. N 1817 ft. W	ft.
DISTANCE TO LEASE LINES	DISTANCE TO NEAREST WELL ON LEASE
1475 ft. N 1817 ft. W	See FIELD(s) Below

FIELD(s) and LIMITATIONS:

* SEE FIELD DISTRICT FOR REPORTING PURPOSES *

FIELD NAME / LEASE NAME	ACRES / NEAREST LEASE	DEPTH	WELL # / NEAREST WE	DIST
WILDCAT	642.20	8,495	1	03
BEAD FARM CO.			0	

RESTRICTIONS: For exploratory test only

THE FOLLOWING RESTRICTIONS APPLY TO ALL FIELDS

This well shall be completed and produced in compliance with applicable special field or statewide spacing and density rules. If this well is to be used for brine mining, underground storage of liquid hydrocarbons in salt formations, or underground storage of gas in salt formations, a permit for that specific purpose must be obtained from Environmental Services prior to construction, including drilling, of the well in accordance with Statewide Rules 81, 95, and 97.

This well must comply to the new SWR 3.13 requirements concerning the isolation of any potential flow zones and zones with corrosive formation fluids. See approved permit for those formations that have been identified for the county in which you are drilling the well in.

CONFIDENTIAL BUSINESS INFORMATION

RAILROAD COMMISSION OF TEXAS
OIL & GAS DIVISION

SWR #13 Formation Data

JEFFERSON (245) County

Formation	Remarks	Geological Order	Effective Date
LAFAYETTE	disposal	1	12/17/2013
CAPROCK	disposal	2	12/17/2013
SPINDLETOP SALT DOME	disposal	3	12/17/2013
FANNETT SALT DOME	disposal	4	12/17/2013
BIG HILL SALT DOME	disposal	5	12/17/2013
PLEISTOCENE-LISSIE	disposal	6	12/17/2013
MIOCENE	disposal	7	12/17/2013
FRIO	disposal	8	12/17/2013
MARINULINA	disposal	9	12/17/2013
HETEROSTEGINA	disposal	10	12/17/2013

The above list may not be all inclusive, and may also include formations that do not intersect all wellbores. The listing order of the Formation information reflects the general stratigraphic order and relative geologic age. This is a dynamic list subject to updates and revisions. It is the operator's responsibility to make sure that at the time of spudding the well the most current list is being referenced. Refer to the RRC website at the following address for the most recent information.
http://www.rrc.texas.gov/oil-gas/compliance-enforcement/rule-13-geologic-formation-info

CONFIDENTIAL BUSINESS INFORMATION

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
481 WINSCOTT ROAD, Ste. 200 • BENBROOK, TEXAS 76126
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
TEXAS FIRM REGISTRATION NO. 10042504
WWW.TOPOGRAPHIC.COM

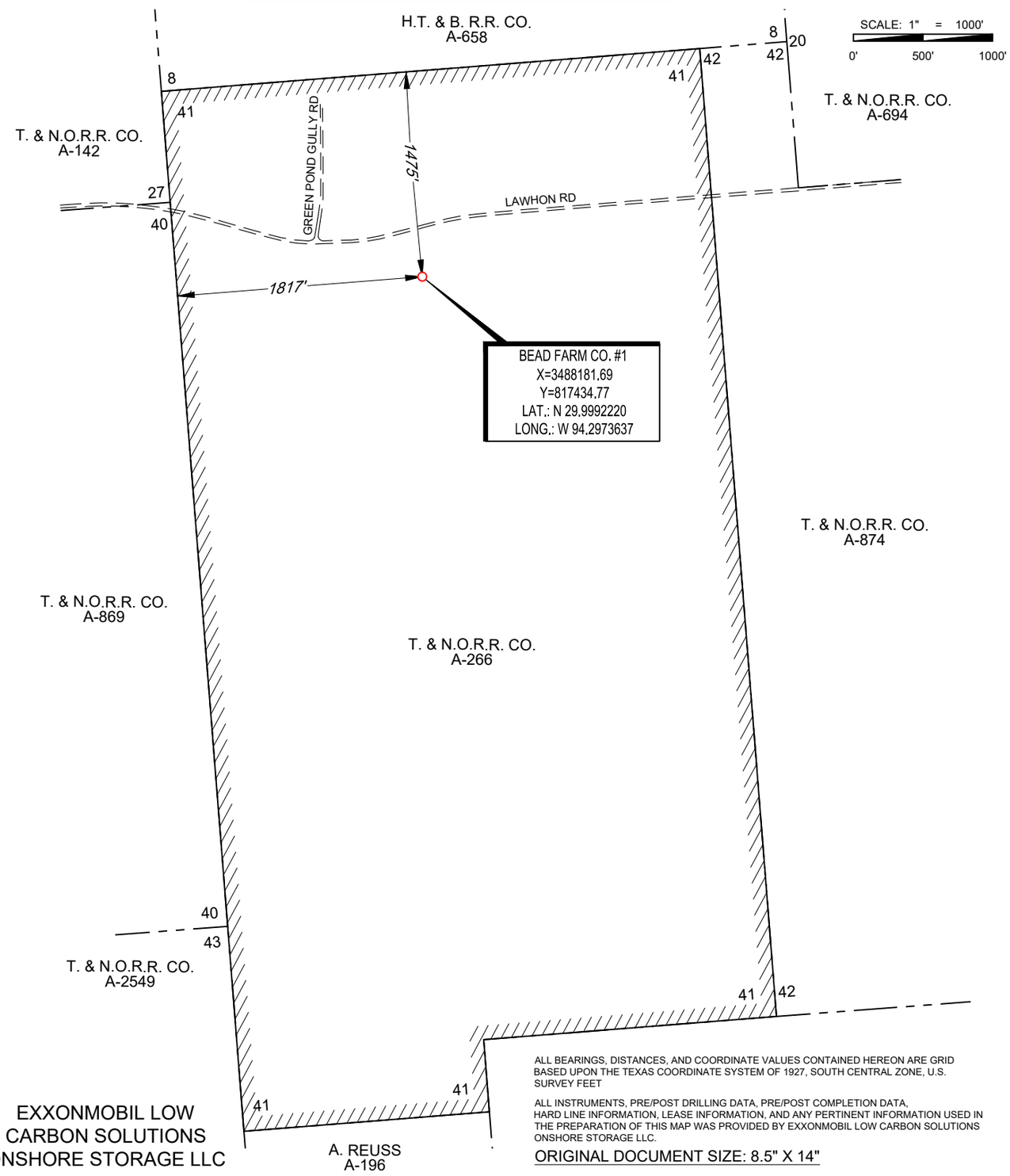
JEFFERSON COUNTY, TEXAS

SECTION 41, T. & N.O.R.R. CO. SURVEY, A-266

LEGEND

- UNIT/LEASE BOUNDARY
- SECTION LINE
- ROAD
- PROPOSED WELL

UNIT/LEASE	SURVEY
S.H.L. 1817' FWL, 1475' FNL	T. & N.O.R.R. CO., A-266



EXXONMOBIL LOW CARBON SOLUTIONS ONSHORE STORAGE LLC

ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREON ARE GRID BASED UPON THE TEXAS COORDINATE SYSTEM OF 1927, SOUTH CENTRAL ZONE, U.S. SURVEY FEET

ALL INSTRUMENTS, PRE/POST DRILLING DATA, PRE/POST COMPLETION DATA, HARD LINE INFORMATION, LEASE INFORMATION, AND ANY PERTINENT INFORMATION USED IN THE PREPARATION OF THIS MAP WAS PROVIDED BY EXXONMOBIL LOW CARBON SOLUTIONS ONSHORE STORAGE LLC.

ORIGINAL DOCUMENT SIZE: 8.5" X 14"

LEASE NAME & WELL NO.: BEAD FARM CO. #1 LEASE ACREAGE: CALLED 642.2 DATE OF SURVEY: APRIL 21, 2023

LOCATED: ±12 MILES SOUTHWEST OF BEAUMONT, TX GROUND ELEVATION: 23'

BEST ACCESSIBILITY TO LOCATION: ±0.02 MILES TO A POINT ±225 FEET NORTHWEST FROM LOCATION

DISTANCE & DIRECTION
FROM HWY JCT. OR TOWN: FROM THE INTERSECTION OF LAWHON RD AND GREEN POND GULLY RD, HEAD EAST

ON LAWHON RD 650 FEET, TURNING SOUTH, HEAD 350 FEET TO SURFACE LOCATION

STATE OF TEXAS
REGISTERED
JEFFREY N. LUEDERS
6512
PROFESSIONAL
LAND SURVEYOR

CERTIFICATION:

I, JEFFREY N. LUEDERS, A REGISTERED PROFESSIONAL LAND SURVEYOR, AND AN AUTHORIZED AGENT OF TOPOGRAPHIC LAND SURVEYORS, DO HEREBY CERTIFY THAT THE ABOVE DESCRIBED "PRE-CONSTRUCTION" PROPOSED WELL LOCATION WAS SURVEYED AND STAKED ON THE GROUND AS SHOWN HEREIN.

FILE NAME LO_TX245_BEAD_FARM_CO_1
DRH

DATE CERTIFIED: 05/16/2023 TEXAS REG. NO. 6512

CONFIDENTIAL BUSINESS INFORMATION

CHRISTI CRADDICK, CHAIRMAN
WAYNE CHRISTIAN, COMMISSIONER
JIM WRIGHT, COMMISSIONER

DANNY SORRELLS
DIRECTOR, OIL AND GAS DIVISION
PETER FISHER, P.G.
DISTRICT DIRECTOR

RAILROAD COMMISSION OF TEXAS

OIL AND GAS DIVISION

OPERATOR Name:	EXXONMOBIL LOW C SOL ON	**RE:**	**Lease:**	BEAD FARM CO.
Address1:	ATTN EDWARD E GRAHAM W1.2B.02			
Address2:	22777 SPRINGWOODS VILLAGE PKWY	**Well No:**	1	
City:	SPRING	**Sec:**	41	**Block:**
State:	TX	**County:**	JEFFERSON	
		Survey Name:	T&NO RR CO	

SWR13EX Application Number: 125182 **Drilling Permit No:** 891726

SWR 13 CASING EXCEPTION APPLICATION/ALTERNATIVE REQUEST APPROVED

The Proposed Casing and Cementing Program submitted for **LEASE** BEAD FARM CO. **;**
WELL 1 has been approved by the Railroad Commission of Texas District Office.

a. A copy of this approved letter must be kept on location during all phases of drilling and/or plugging operations. Once approved, changes CANNOT be made to the Proposed Casing Program on the original application without additional approval from the Railroad Commission of Texas District Office.

b. Any substantive modifications to the cement program require prior approval from the Railroad Commission of Texas District Office, and may require re-submission of the SWR 13 (Statewide Rule 13) Alternate Surface Casing Application. Contact the Railroad Commission of Texas District Office for more information.

c. The tail slurry must be sufficient to fill the Zone of Critical Cement as described in Statewide Rule 13(b)(1)(H)(i). In addition, all cement slurries must be mixed on location as described in Application for Alternate Surface Casing Program.

d. The casing and cement program shall adhere to the following specifications:

Set 2200 feet of surface casing and circulate cement from the shoe to the ground surface.

IF CEMENT IS NOT CIRCULATED TO THE GROUND SURFACE AS REQUIRED BY THIS EXCEPTION, YOU MUST CONTACT THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE IMMEDIATELY AND FOLLOW THE PROCEDURES SET OUT IN RULE 13(b)(1)(H)(iii) OR AS REQUIRED BY THE RAILROAD COMMISSION OF TEXAS DISTRICT OFFICE.

You must comply with all other provisions of SWR 13 (Statewide Rule 13) and a representative of the cementing company who performs the cementing job for the protection of usable quality water strata must sign the Form W-15 attesting to the information regarding cementing operations performed; including circulation of cement. (Note: If surface casing is set below the approved depth, this can result in denial of future Statewide Rule 13(b)(1)(H)(i) requests.) A condition of the approved drilling permit requires notification to the Railroad Commission of Texas District Office eight (8) hours prior to the time casing is to be set/cemented in the well. If your exception request was submitted after the subject well has been drilled and completed, the operator may be referred for enforcement action.

This authorization shall expire within five (5) years from the date the Groundwater Protection Determination was issued, or at the expiration of the drilling permit (if the well is not spudded prior to expiration) for the referenced well, whichever occurs first. Furthermore, this authorization supersedes any prior authorizations issued for the referenced well.

This exception is based on information provided when the application was submitted 09/26/2023 .
If any information has changed, you must contact the appropriate Railroad Commission of Texas District Office, and submit a new application if applicable. If you have questions, please contact the appropriate Oil and Gas District office.

RRC APPROVAL BY: Matthew Pollak DATE: 09/26/2023

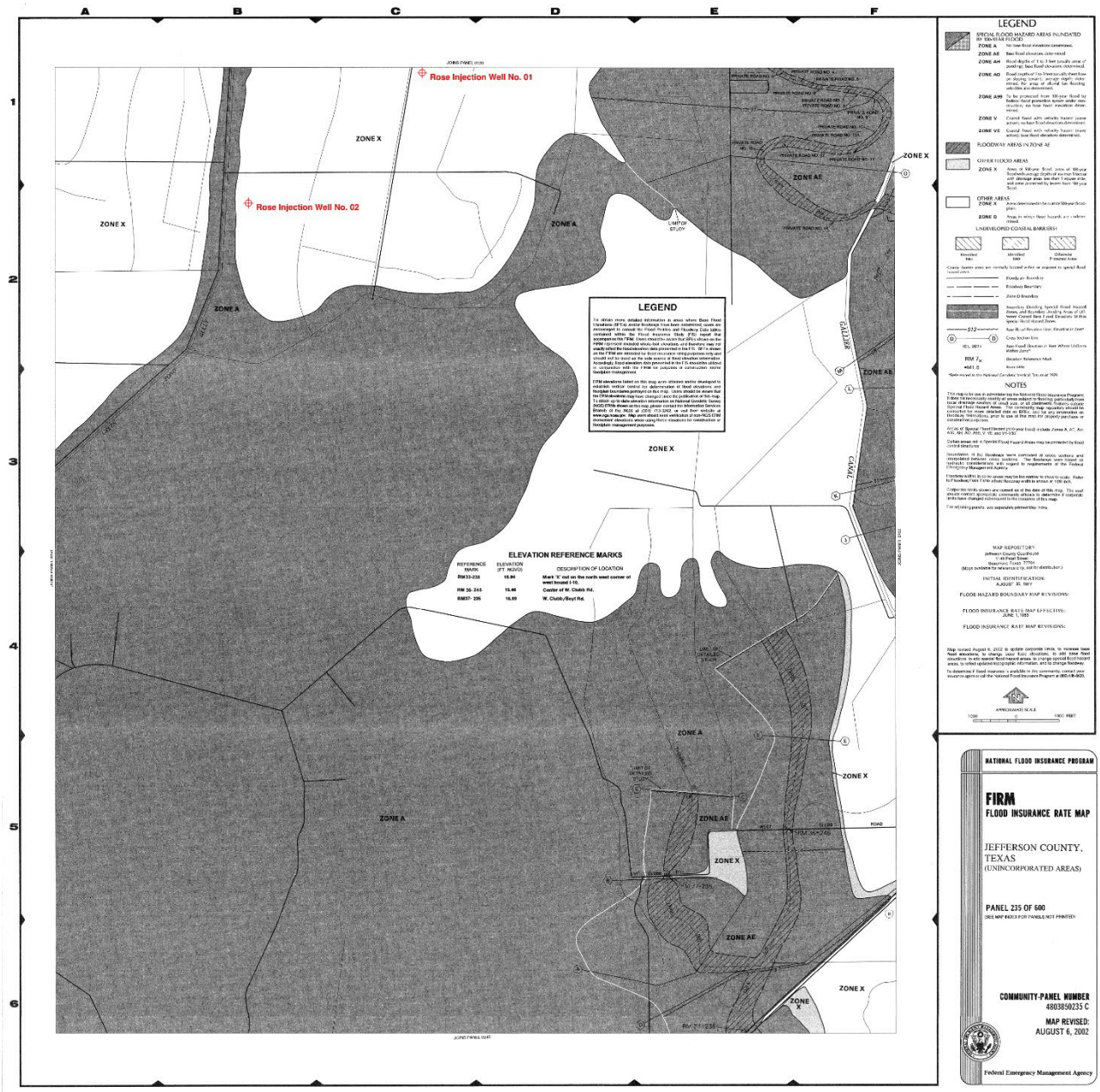
PETER FISHER, P.G.

DISTRICT DIRECTOR

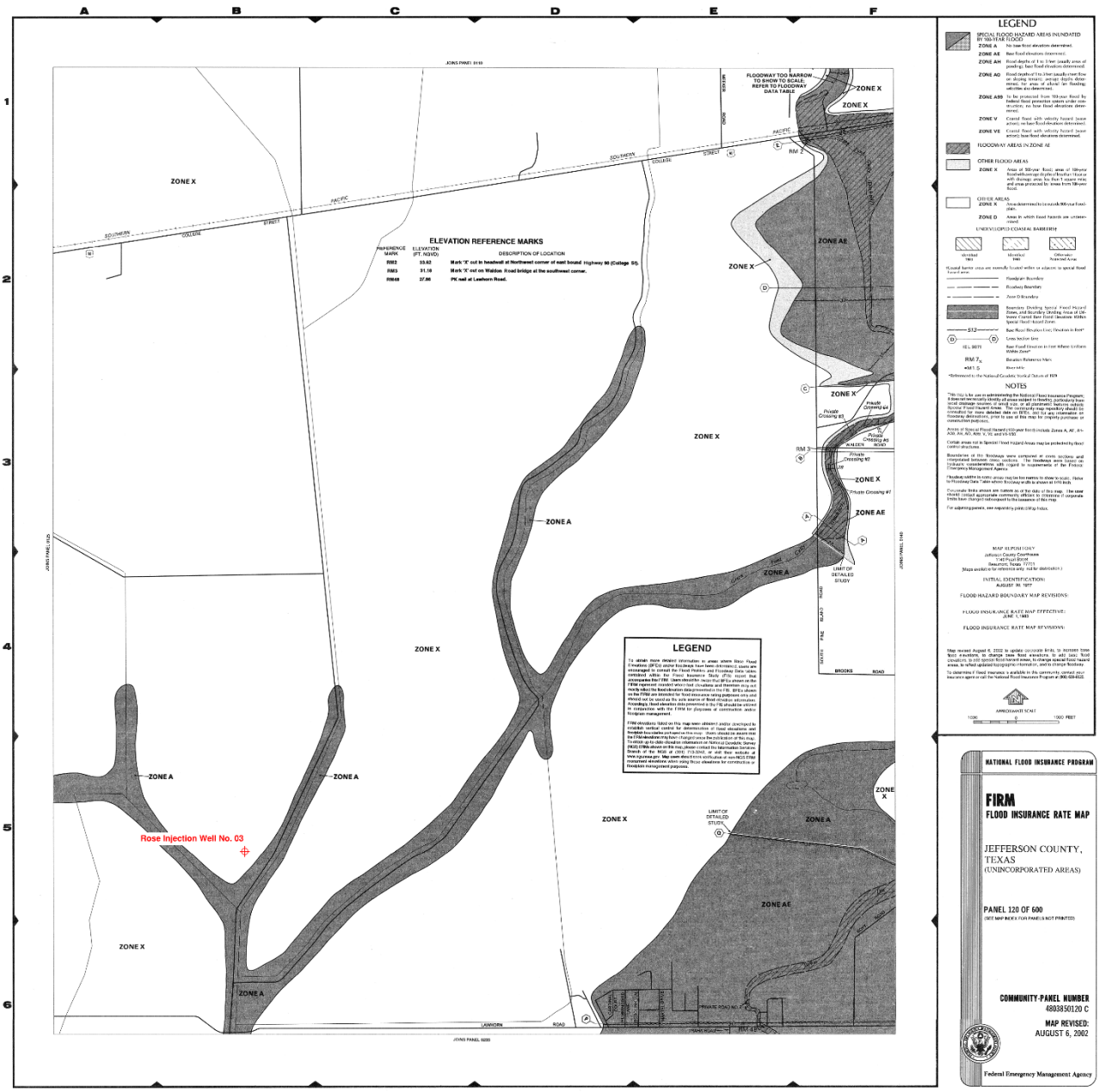
Appendix G Emergency and Remedial Response Plan Files

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Appendix G-1: FEMA Flood Zone Hazards Map for Rose Project CCS Injection Wells No. 01 and No. 02



Appendix G-2: FEMA Flood Zone Hazards Map for Rose Project CCS Injection Well No. 03



Appendix G-3 Integrated Contingency Plan

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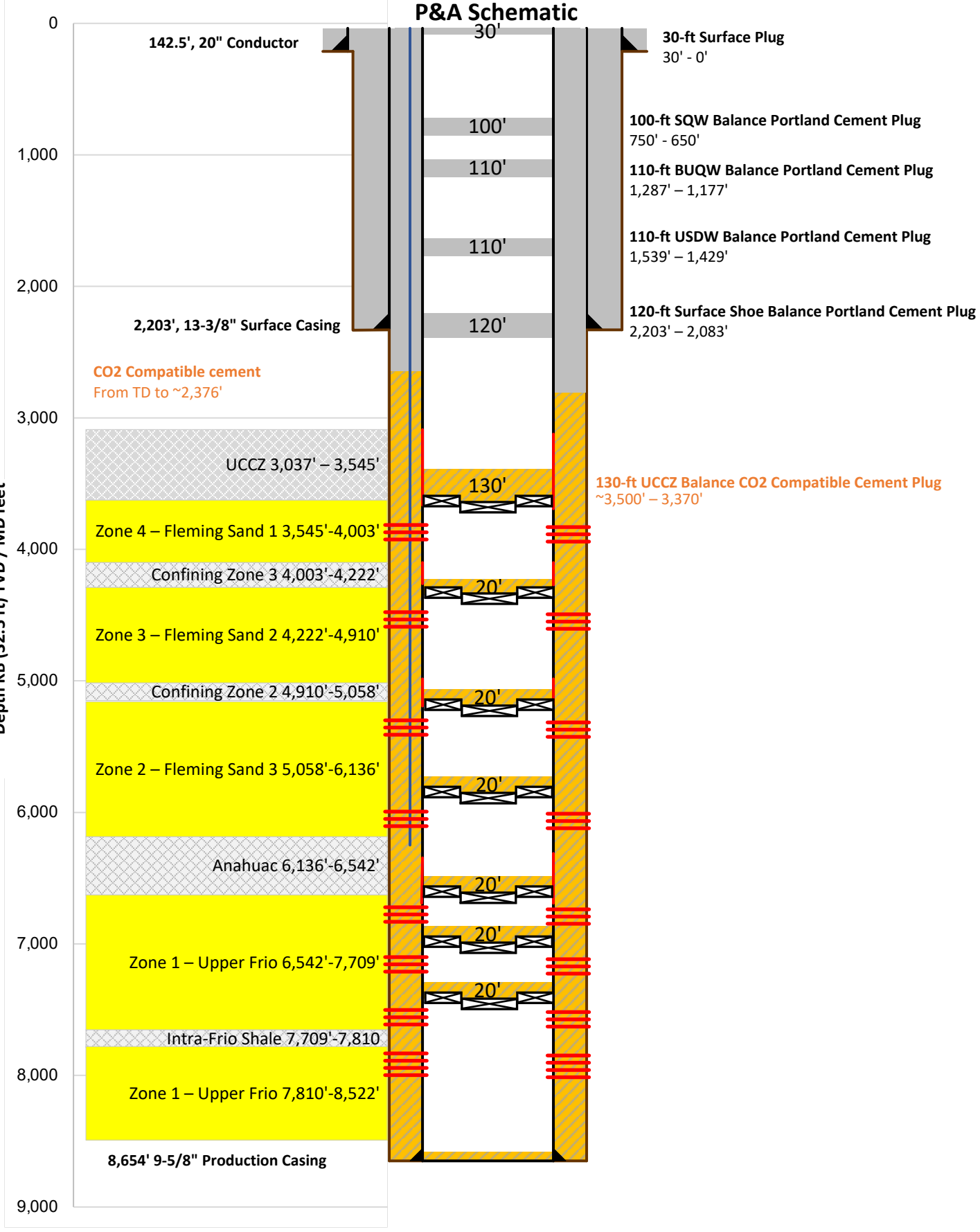
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CONFIDENTIAL BUSINESS INFORMATION

Appendix H: Plugging Schematics and Procedures

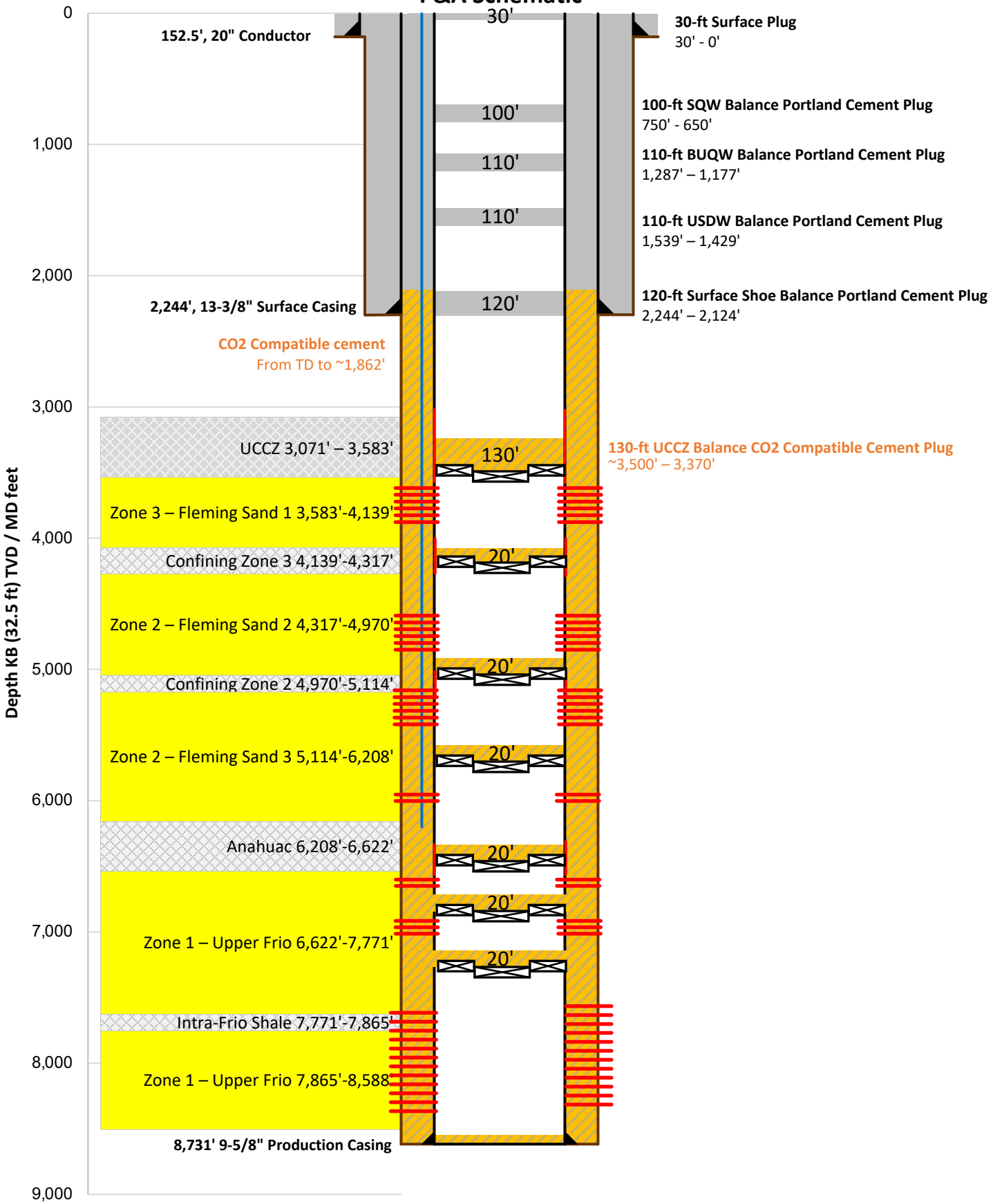
CONFIDENTIAL BUSINESS INFORMATION

Labelle Properties Ltd No. 1
Rose CCS Project Injection Well No. 01
P&A Schematic



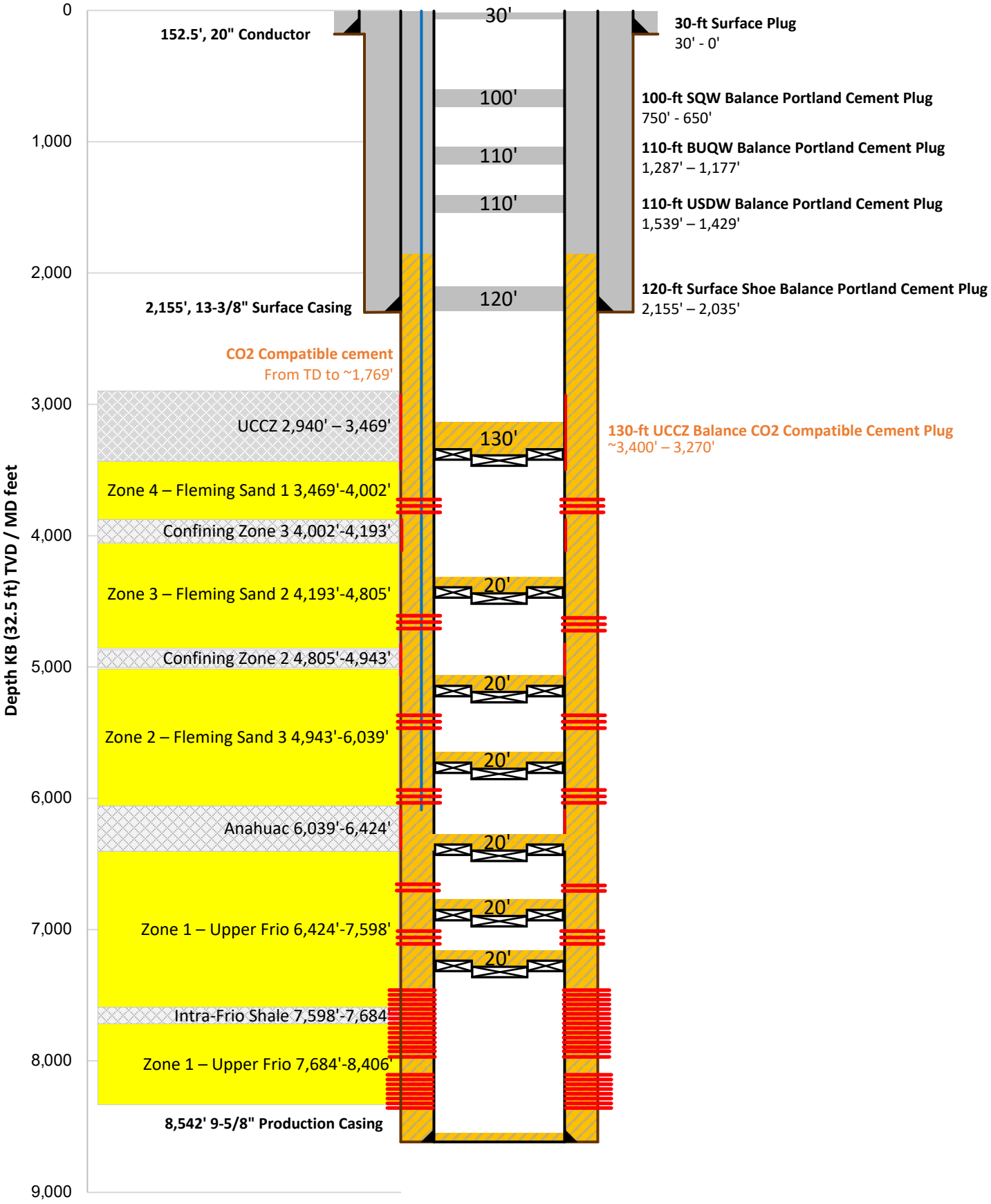
CONFIDENTIAL BUSINESS INFORMATION

Bead Farm Co 2
Rose CCS Project Injection Well No. 02
P&A Schematic



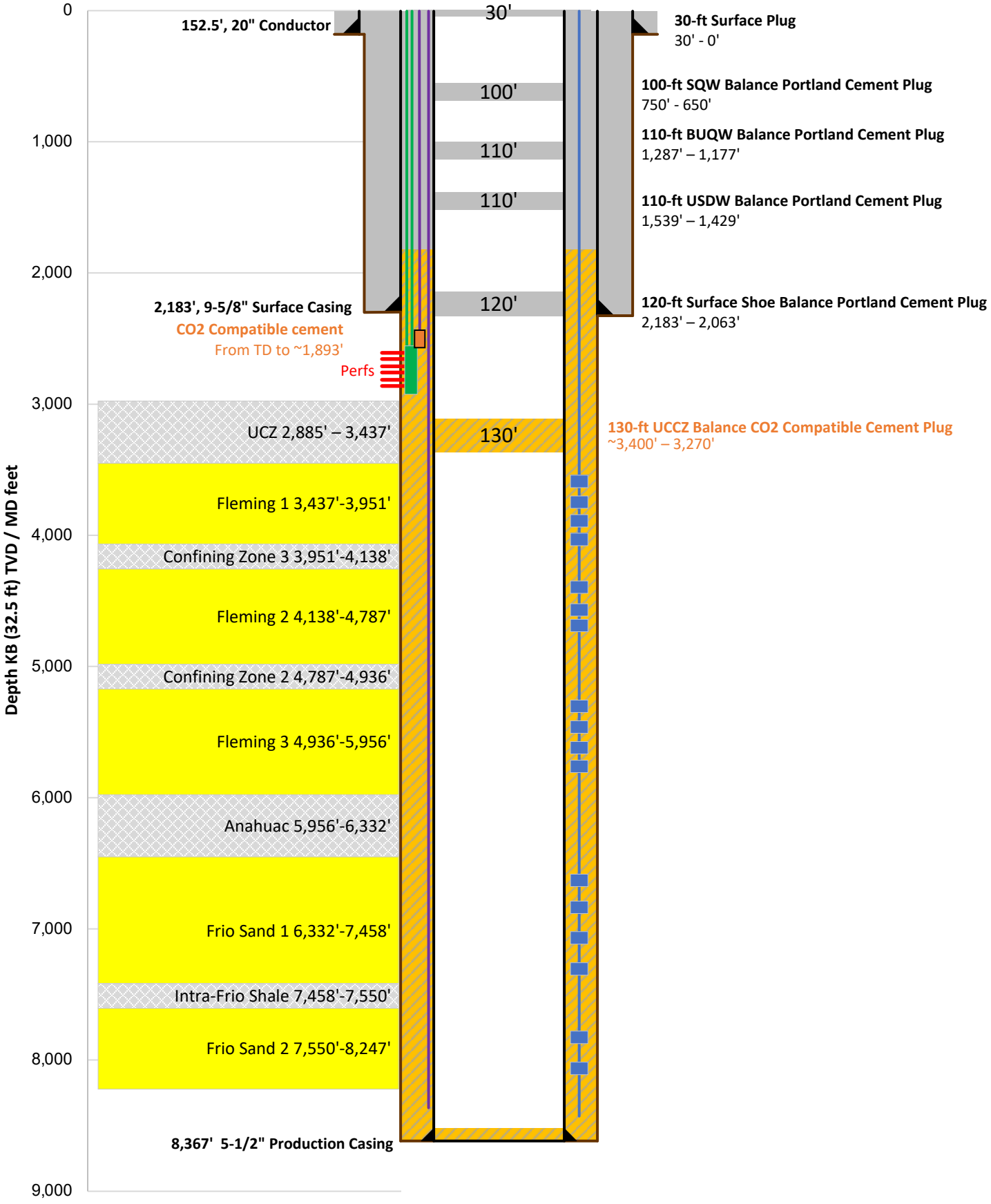
CONFIDENTIAL BUSINESS INFORMATION

Bead Farm 3
Rose CCS Project Injection Well No. 03
P&A Schematic



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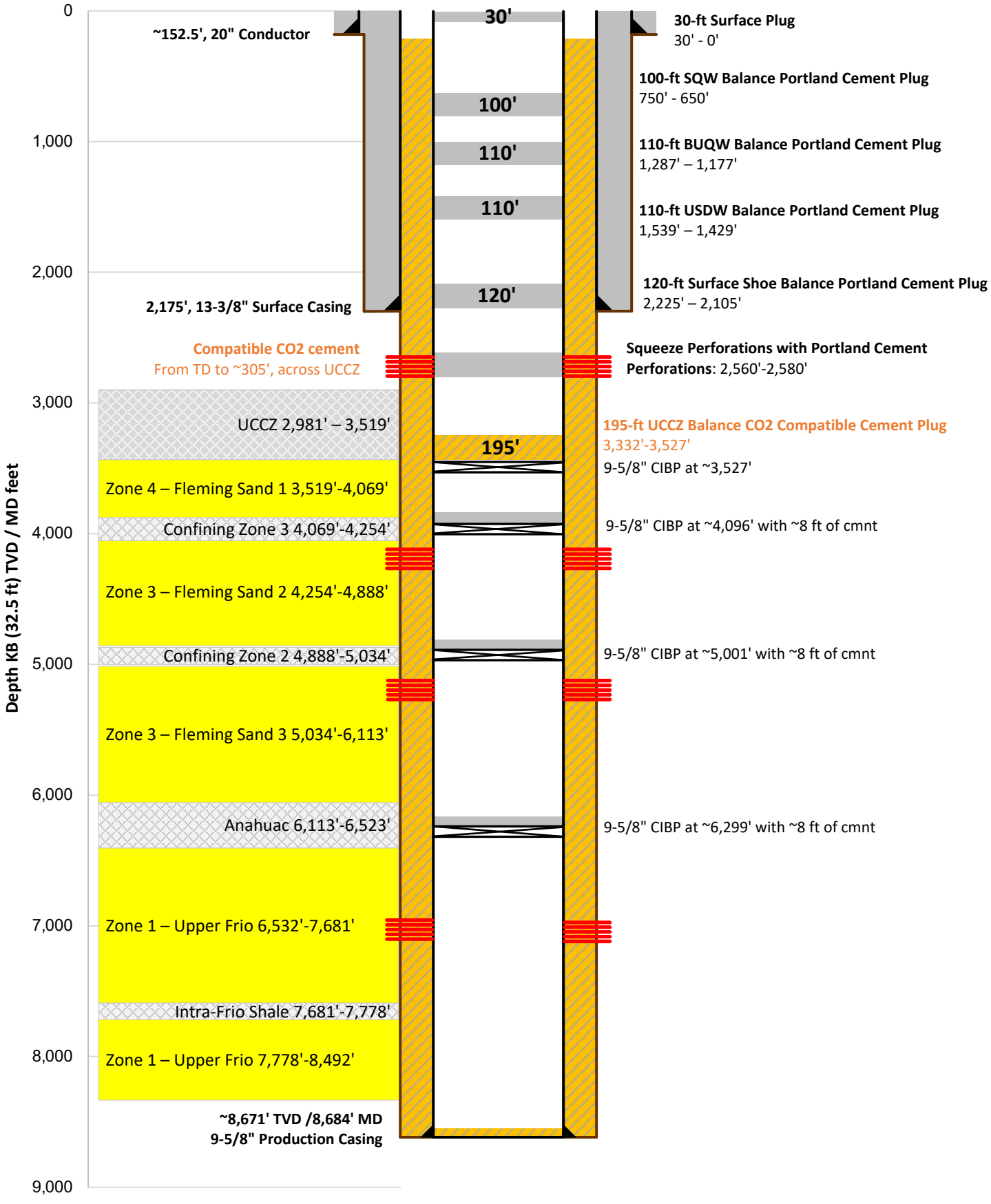
Bead Farm Co #4
Rose CCS Project In Zone Monitor
P&A Schematic



CONFIDENTIAL BUSINESS INFORMATION

Rose CCS Project Bead Farm 1

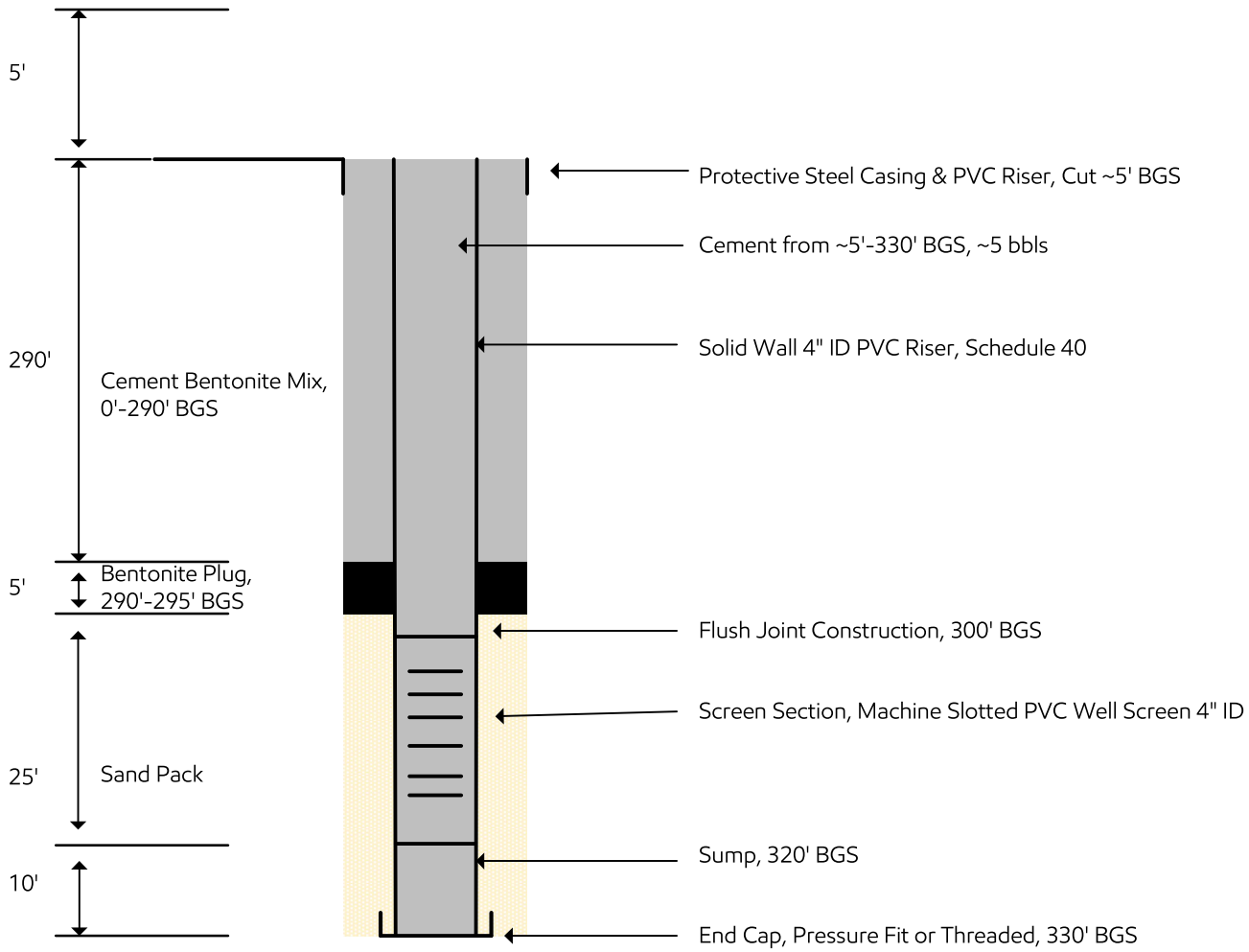
P&A Post Recomplete



CONFIDENTIAL BUSINESS INFORMATION

Rose USDW #1

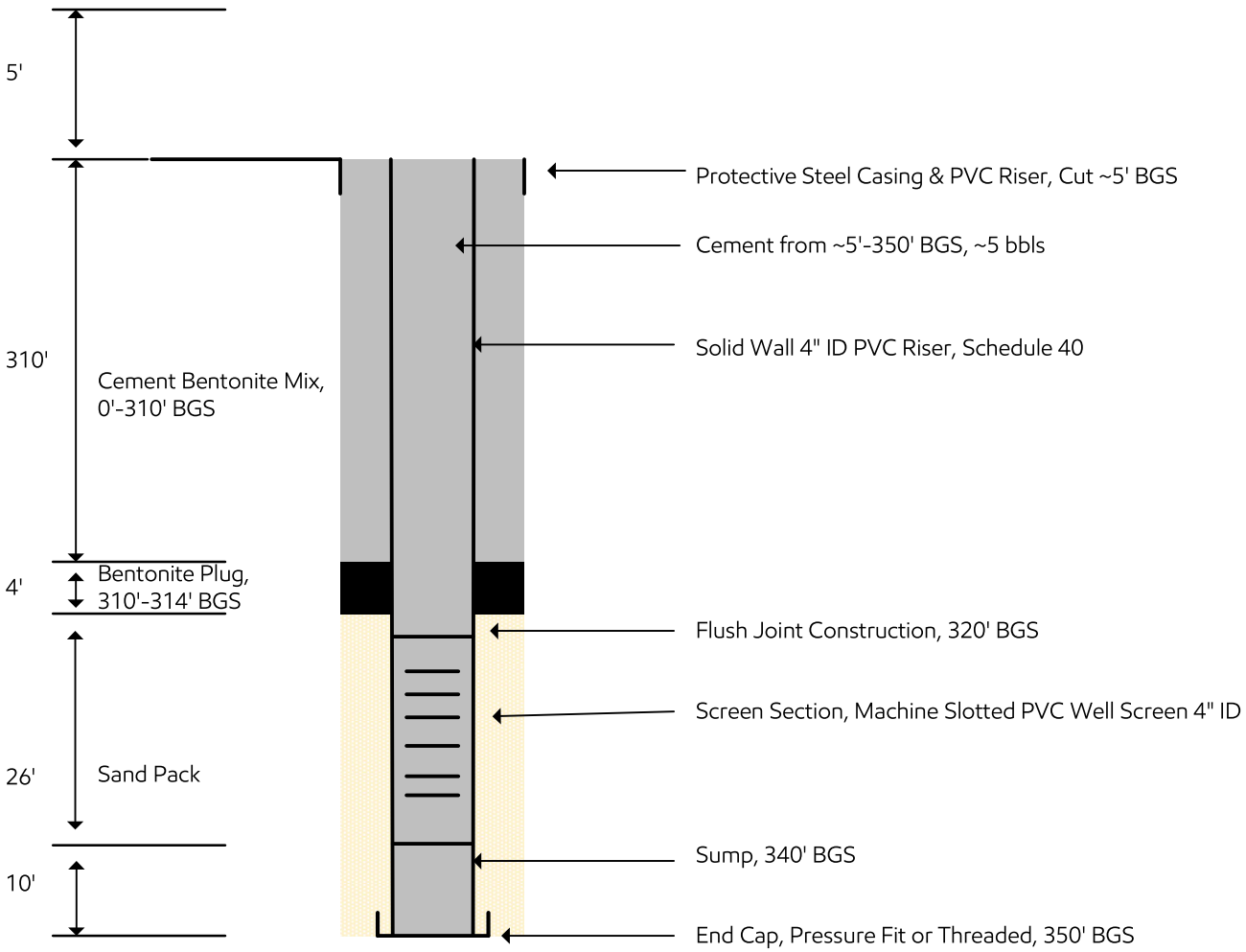
Proposed P&A



Ft BGS = Feet Below Ground Surface

CONFIDENTIAL BUSINESS INFORMATION

Rose USDW #2
Proposed P&A

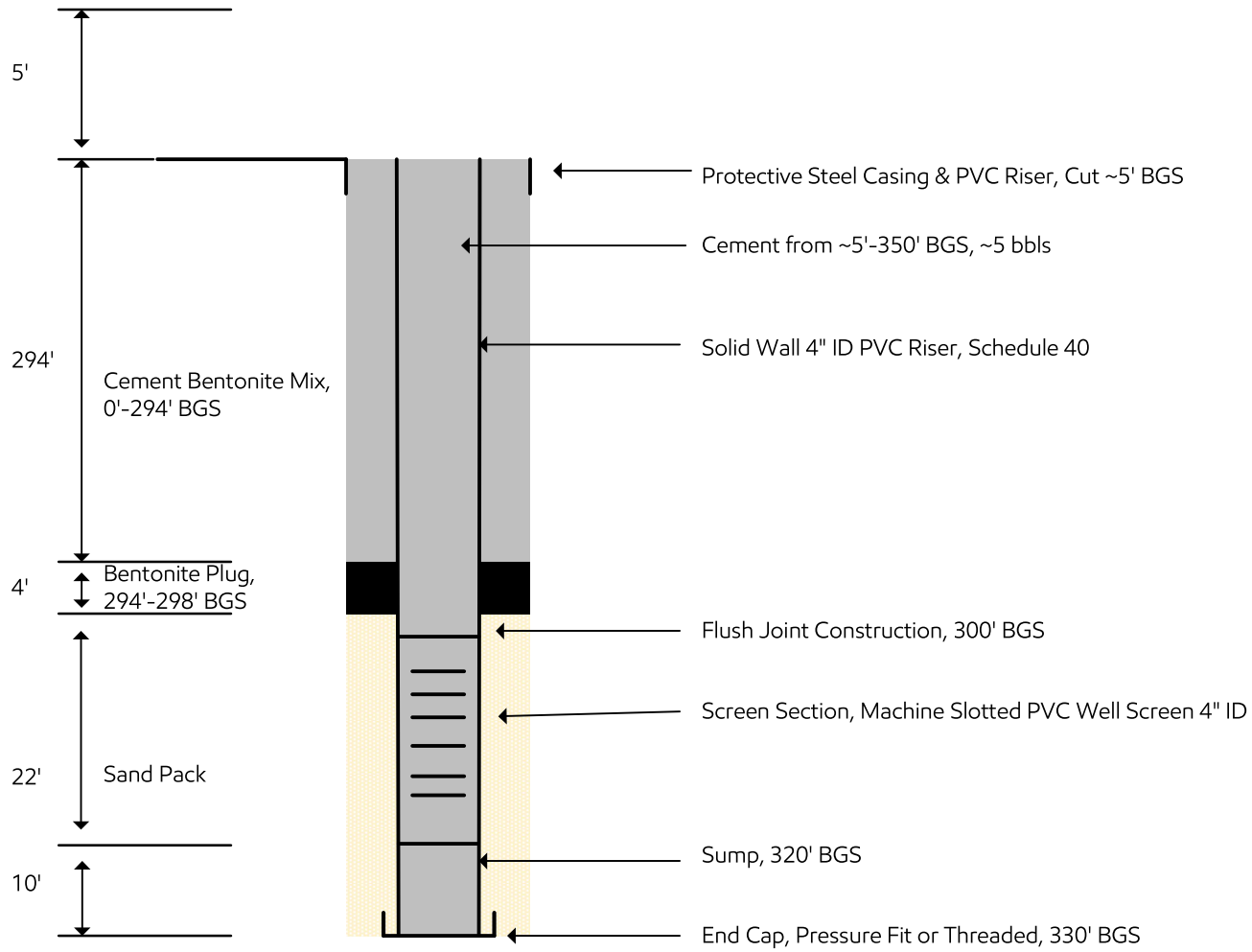


Ft BGS = Feet Below Ground Surface

CONFIDENTIAL BUSINESS INFORMATION

Rose USDW #3

Proposed P&A



Ft BGS = Feet Below Ground Surface

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Appendix I Seismic Risk and Fault-Slip Potential

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Appendix J Financial Assurance

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Appendix J-1: Independently Audited Financial Statements

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Appendix J-2: Executed Corporate Guarantee

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Appendix J-3: Letter from Chief Financial Officer

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Appendix J-4: EEHC Certification

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Appendix J-5: Cost Estimate and Documentation for TAC §5.205

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Appendix K Environmental Justice

Appendix K.1 EJScreen V2.2 Reports

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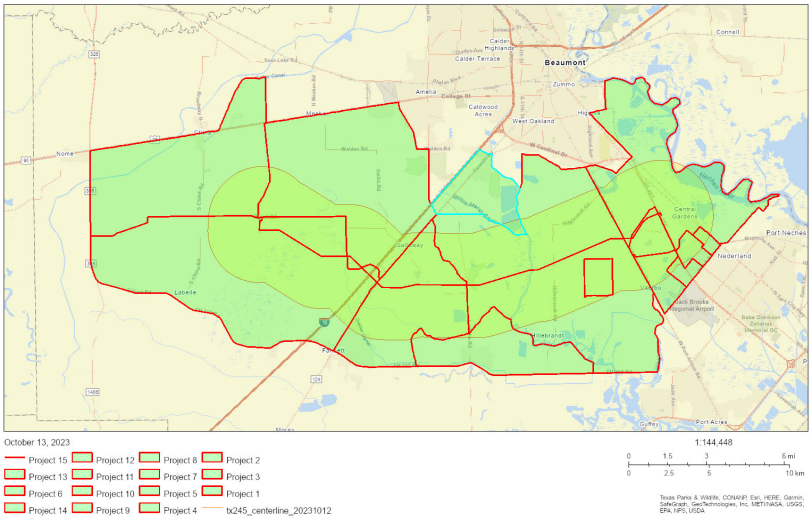
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Beaumont, TX

Blockgroup: 482450013032
Population: 837
Area in square miles: 5.96

A3 Landscape



COMMUNITY INFORMATION

Low income: 26 percent

People of color: 81 percent

Less than high school education: 3 percent

Limited English households: 0 percent

Unemployment: 35 percent

Persons with disabilities: 13 percent

Male: 52 percent

Female: 48 percent

77 years
Average life expectancy

$30,055
Per capita income

Number of households: 438

Owner occupied: 54 percent

BREAKDOWN BY RACE

White: 19%

Black: 76%

American Indian: 0%

Asian: 1%

Hawaiian/Pacific Islander: 0%

Other race: 0%

Two or more races: 4%

Hispanic: 0%

BREAKDOWN BY AGE

From Ages 1 to 4	3%
From Ages 1 to 18	8%
From Ages 18 and up	92%
From Ages 65 and up	23%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	77%
Spanish	4%
French, Haitian, or Cajun	1%
Other Indo-European	3%
Chinese (including Mandarin, Cantonese)	1%
Vietnamese	5%
Other Asian and Pacific Island	2%
Arabic	7%
Total Non-English	23%

CONFIDENTIAL BUSINESS INFORMATION

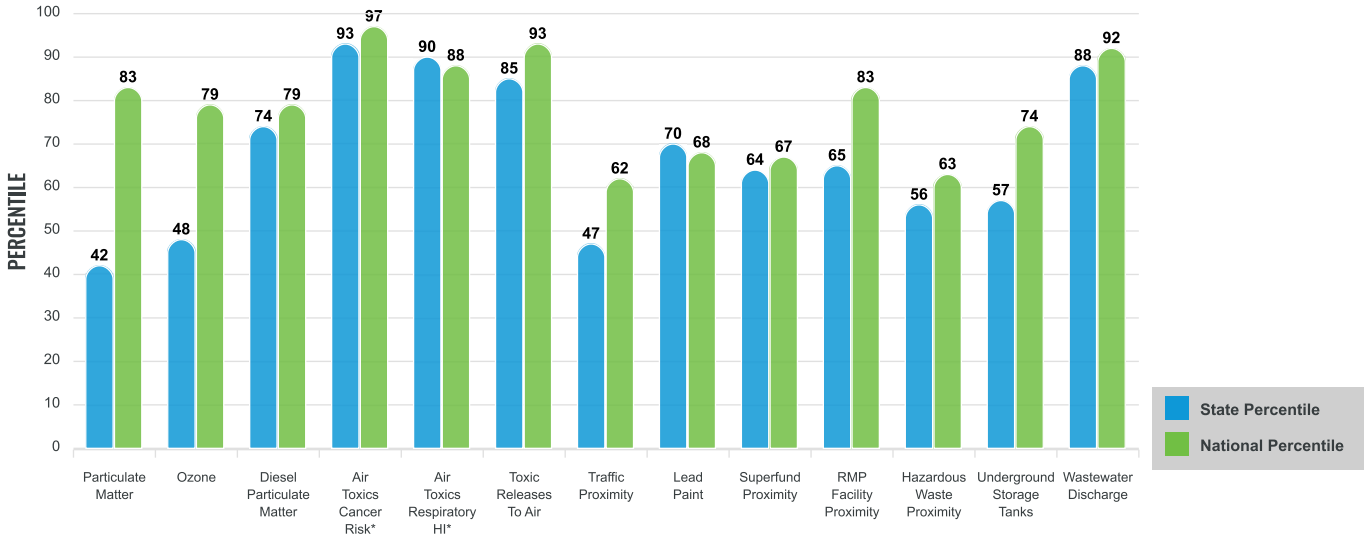
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

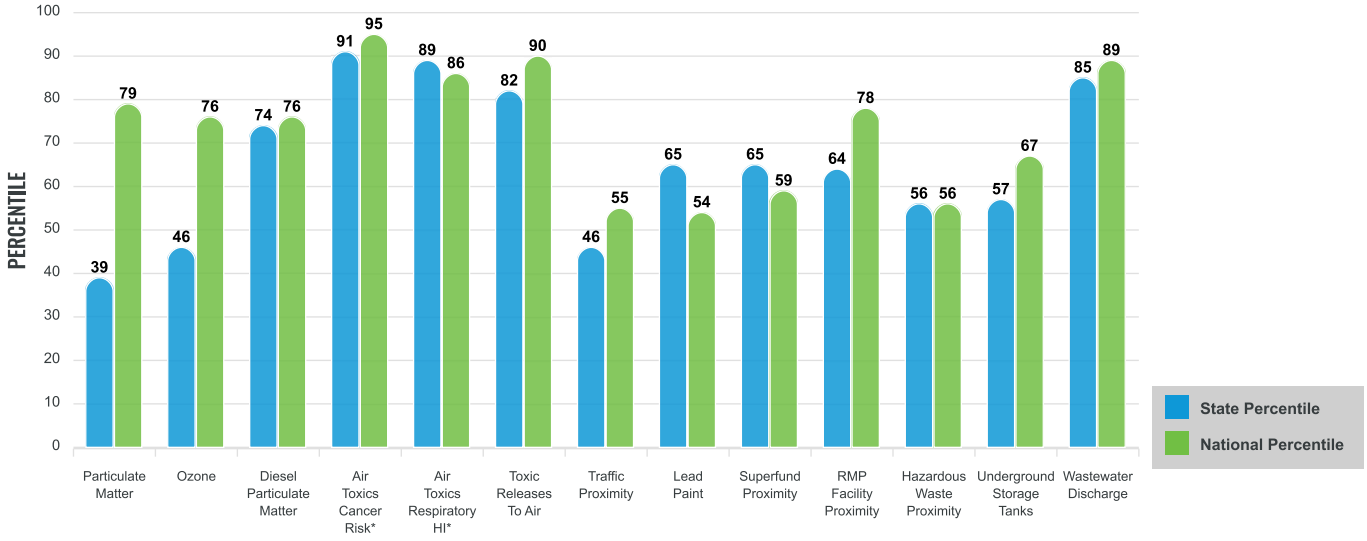
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450013032

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.83	9.11	25	8.08	68
Ozone (ppb)	62.3	64.6	30	61.6	59
Diesel Particulate Matter (µg/m^3)	0.264	0.218	66	0.261	61
Air Toxics Cancer Risk* (lifetime risk per million)	40	28	89	25	94
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	25,000	12,000	85	4,600	96
Traffic Proximity (daily traffic count/distance to road)	44	150	33	210	37
Lead Paint (% Pre-1960 Housing)	0.12	0.17	61	0.3	38
Superfund Proximity (site count/km distance)	0.042	0.085	50	0.13	38
RMP Facility Proximity (facility count/km distance)	0.38	0.63	57	0.43	71
Hazardous Waste Proximity (facility count/km distance)	0.21	0.75	43	1.9	37
Underground Storage Tanks (count/km^2)	1.3	2.3	46	3.9	51
Wastewater Discharge (toxicity-weighted concentration/m distance)	1.7	0.91	98	22	93
SOCIOECONOMIC INDICATORS					
Demographic Index	54%	46%	61	35%	77
Supplemental Demographic Index	17%	17%	58	14%	69
People of Color	81%	58%	69	39%	83
Low Income	26%	34%	42	31%	49
Unemployment Rate	35%	5%	99	6%	99
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	3%	16%	19	12%	22
Under Age 5	3%	6%	30	6%	35
Over Age 64	23%	14%	84	17%	77
Low Life Expectancy	21%	20%	66	20%	68

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	0
Water Dischargers	4
Air Pollution	0
Brownfields	0
Toxic Release Inventory	0

Other community features within defined area:

Schools	0
Hospitals	0
Places of Worship	1

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	Yes

Report for Blockgroup: 482450013032

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	21%	20%	66	20%	68
Heart Disease	6	5.9	53	6.1	50
Asthma	9.1	9.2	47	10	27
Cancer	6.1	5.2	71	6.1	48
Persons with Disabilities	12%	12.3%	54	13.4%	46

CLIMATE INDICATORS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	57%	10%	96	12%	96
Wildfire Risk	67%	30%	72	14%	87

CRITICAL SERVICE GAPS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	28%	15%	83	14%	87
Lack of Health Insurance	16%	18%	46	9%	85
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450013032

CONFIDENTIAL BUSINESS INFORMATION

EPA

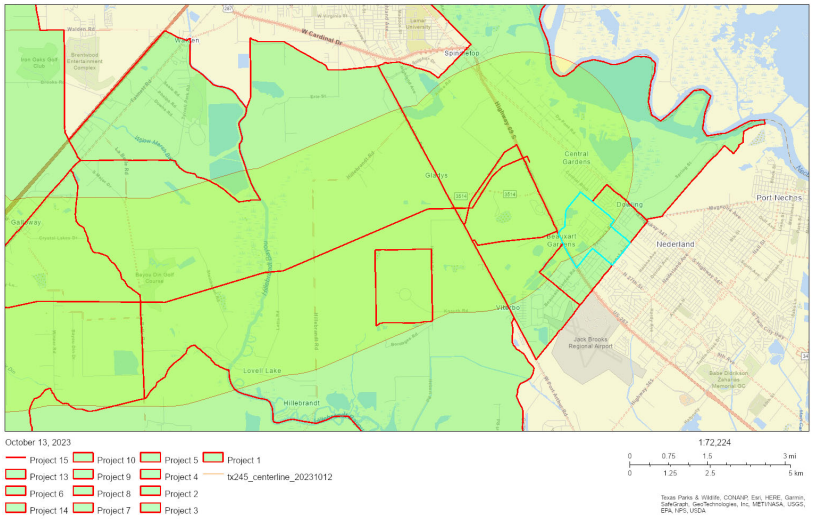
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Central Gardens, TX

Blockgroup: 482450112041
Population: 1,313
Area in square miles: 1.09

A3 Landscape



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	91%
Spanish	6%
Vietnamese	2%
Other Asian and Pacific Island	1%
Total Non-English	9%

COMMUNITY INFORMATION

Low income: 8 percent
People of color: 27 percent
Less than high school education: 9 percent
Limited English households: 3 percent
Unemployment: 3 percent
Persons with disabilities: 14 percent
Male: 46 percent
Female: 54 percent
79 years — Average life expectancy
$63,117 — Per capita income
Number of households: 584
Owner occupied: 74 percent

BREAKDOWN BY RACE

White: 73%
Black: 0%
American Indian: 0%
Asian: 8%
Hawaiian/Pacific Islander: 2%
Other race: 0%
Two or more races: 5%
Hispanic: 12%

BREAKDOWN BY AGE

From Ages 1 to 4	0%
From Ages 1 to 18	6%
From Ages 18 and up	94%
From Ages 65 and up	7%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	100%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

CONFIDENTIAL BUSINESS INFORMATION

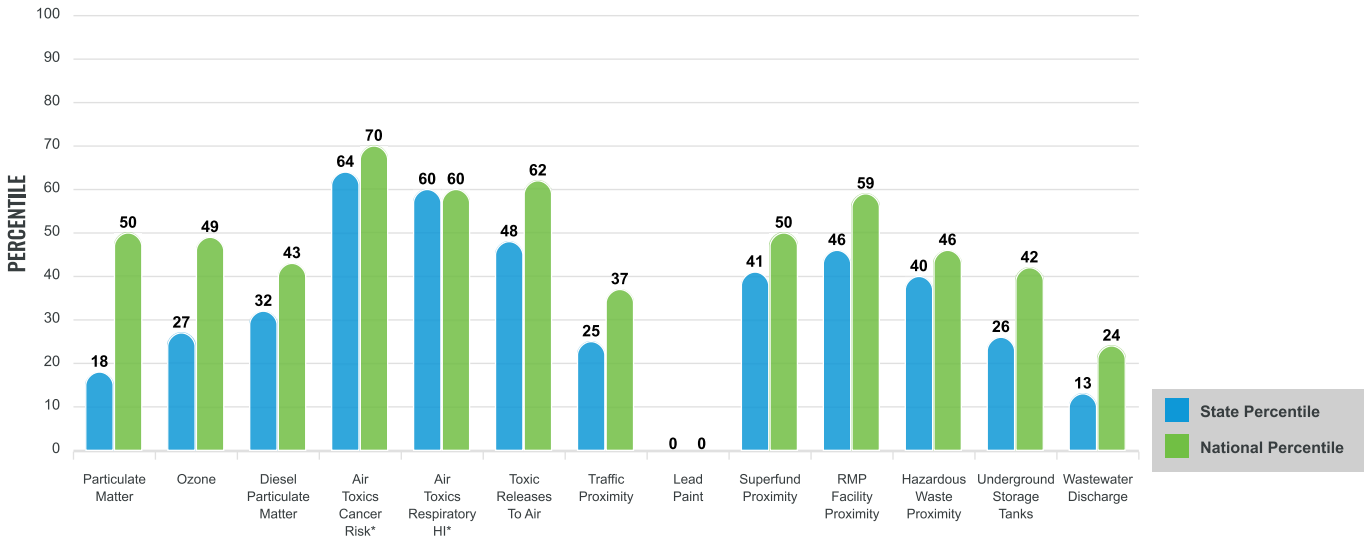
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

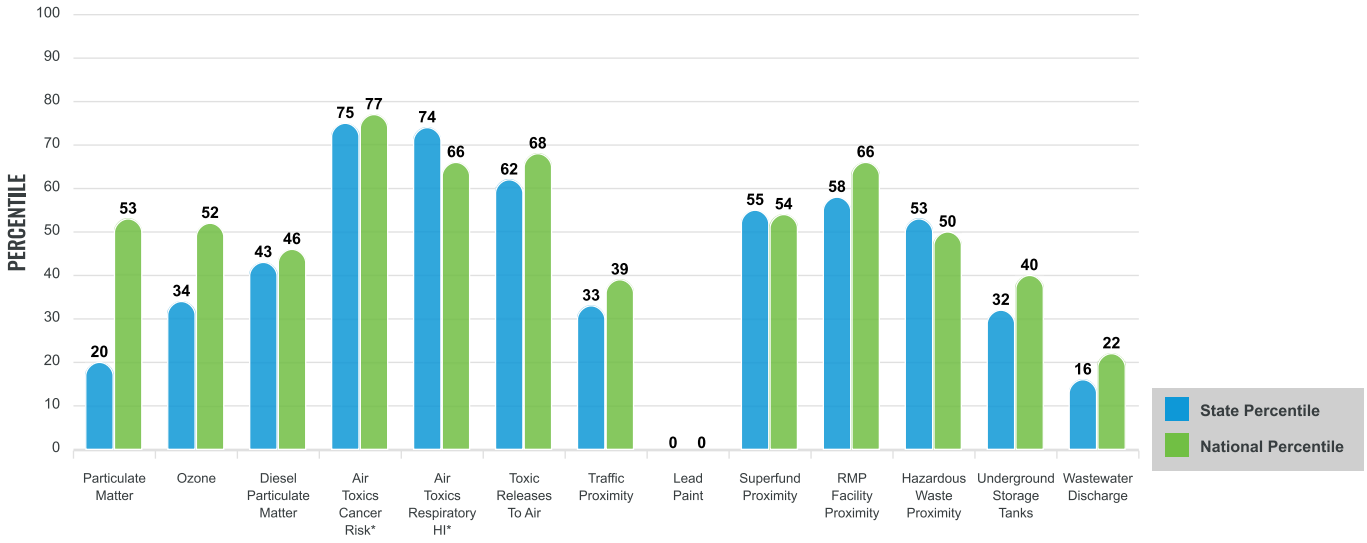
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450112041

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.88	9.11	28	8.08	70
Ozone (ppb)	63.6	64.6	44	61.6	67
Diesel Particulate Matter (µg/m^3)	0.235	0.218	56	0.261	54
Air Toxics Cancer Risk* (lifetime risk per million)	50	28	97	25	94
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	81,000	12,000	96	4,600	99
Traffic Proximity (daily traffic count/distance to road)	68	150	44	210	47
Lead Paint (% Pre-1960 Housing)	0	0.17	0	0.3	0
Superfund Proximity (site count/km distance)	0.1	0.085	77	0.13	67
RMP Facility Proximity (facility count/km distance)	2.9	0.63	97	0.43	98
Hazardous Waste Proximity (facility count/km distance)	1.1	0.75	78	1.9	62
Underground Storage Tanks (count/km^2)	0.87	2.3	39	3.9	46
Wastewater Discharge (toxicity-weighted concentration/m distance)	5.8E-05	0.91	21	22	27
SOCIOECONOMIC INDICATORS					
Demographic Index	17%	46%	11	35%	26
Supplemental Demographic Index	8%	17%	21	14%	25
People of Color	27%	58%	20	39%	46
Low Income	8%	34%	13	31%	13
Unemployment Rate	3%	5%	44	6%	41
Limited English Speaking Households	3%	8%	54	5%	70
Less Than High School Education	9%	16%	42	12%	54
Under Age 5	0%	6%	0	6%	0
Over Age 64	7%	14%	24	17%	15
Low Life Expectancy	19%	20%	44	20%	50

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	0
Water Dischargers	4
Air Pollution	0
Brownfields	0
Toxic Release Inventory	0

Other community features within defined area:

Schools	1
Hospitals	0
Places of Worship	0

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	No

Report for Blockgroup: 482450112041

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	20%	44	20%	50
Heart Disease	6.2	5.9	57	6.1	54
Asthma	9.1	9.2	47	10	27
Cancer	5.9	5.2	68	6.1	43
Persons with Disabilities	10.9%	12.3%	45	13.4%	38

CLIMATE INDICATORS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	5%	10%	50	12%	39
Wildfire Risk	99%	30%	92	14%	95

CRITICAL SERVICE GAPS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	3%	15%	22	14%	18
Lack of Health Insurance	12%	18%	33	9%	76
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	No	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450112041

CONFIDENTIAL BUSINESS INFORMATION

EPA

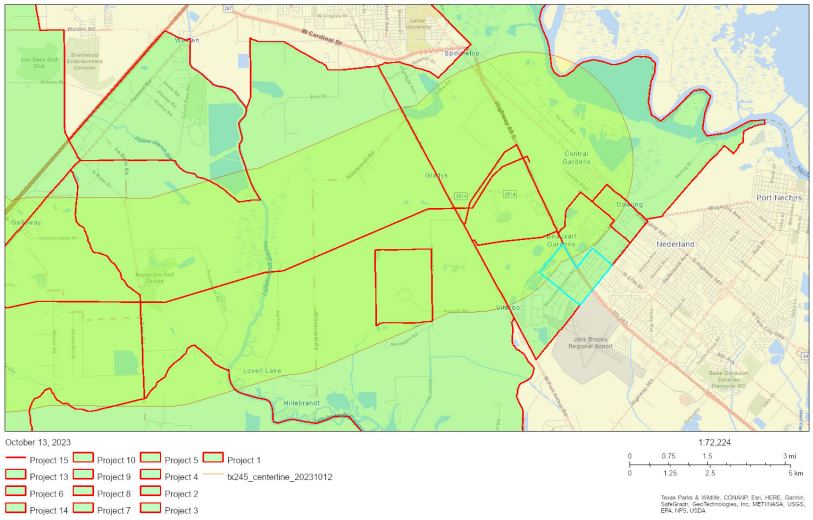
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Nederland, TX

Blockgroup: 482450112042
Population: 1,431
Area in square miles: 0.81

A3 Landscape



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	91%
Spanish	6%
Vietnamese	2%
Other Asian and Pacific Island	1%
Total Non-English	9%

COMMUNITY INFORMATION

Low income: 30 percent
People of color: 9 percent
Less than high school education: 7 percent
Limited English households: 0 percent
Unemployment: 0 percent
Persons with disabilities: 12 percent
Male: 38 percent
Female: 62 percent
79 years
Average life expectancy
$31,218
Per capita income
Number of households: 540
Owner occupied: 83 percent

BREAKDOWN BY RACE

White: 91%
Black: 0%
American Indian: 0%
Asian: 0%
Hawaiian/Pacific Islander: 0%
Other race: 0%
Two or more races: 5%
Hispanic: 3%

BREAKDOWN BY AGE

From Ages 1 to 4	13%
From Ages 1 to 18	33%
From Ages 18 and up	67%
From Ages 65 and up	21%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

CONFIDENTIAL BUSINESS INFORMATION

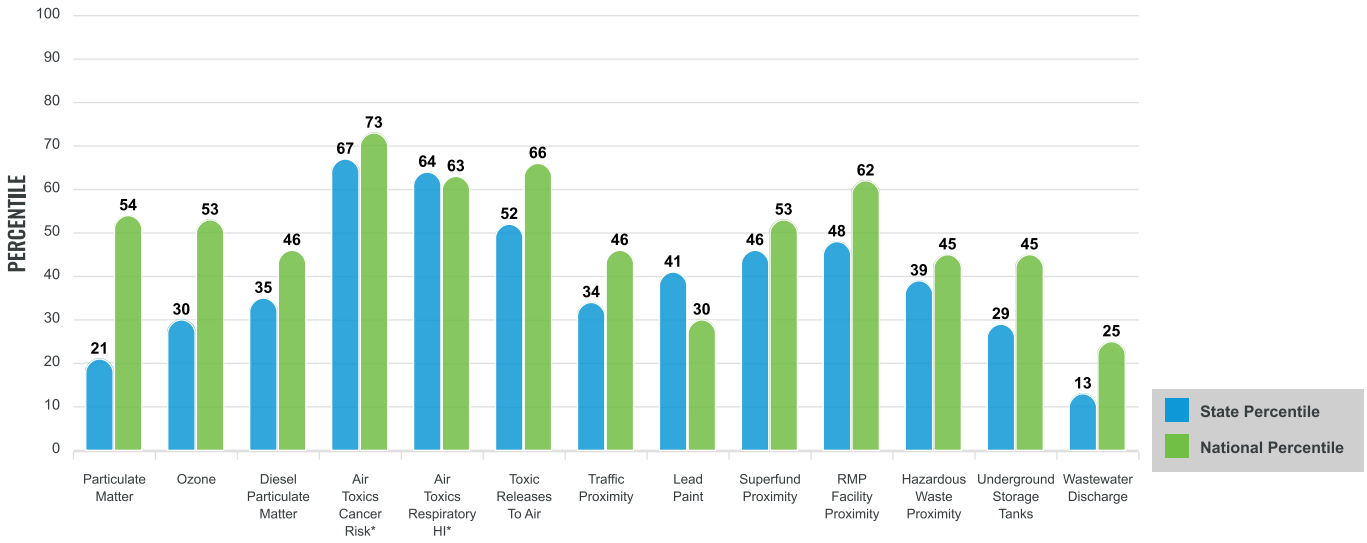
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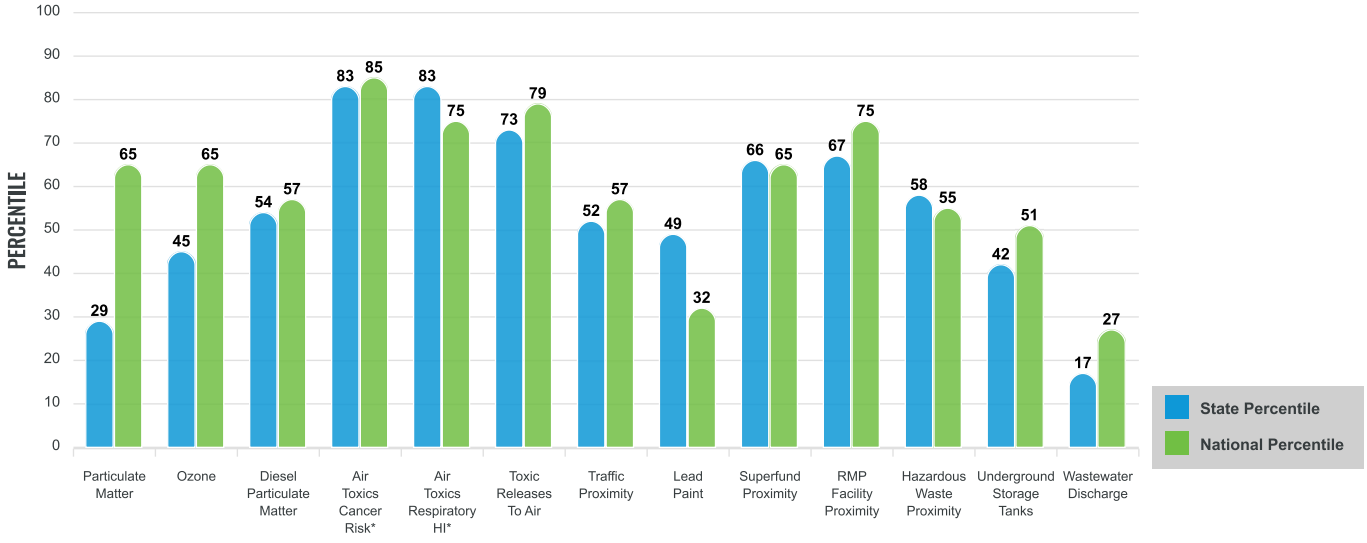
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450112042

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.88	9.11	28	8.08	70
Ozone (ppb)	63.6	64.6	44	61.6	67
Diesel Particulate Matter (µg/m^3)	0.235	0.218	56	0.261	54
Air Toxics Cancer Risk* (lifetime risk per million)	50	28	97	25	94
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	77,000	12,000	96	4,600	99
Traffic Proximity (daily traffic count/distance to road)	100	150	58	210	58
Lead Paint (% Pre-1960 Housing)	0.07	0.17	53	0.3	30
Superfund Proximity (site count/km distance)	0.099	0.085	77	0.13	66
RMP Facility Proximity (facility count/km distance)	2	0.63	93	0.43	96
Hazardous Waste Proximity (facility count/km distance)	0.66	0.75	67	1.9	54
Underground Storage Tanks (count/km^2)	1	2.3	42	3.9	48
Wastewater Discharge (toxicity-weighted concentration/m distance)	4E-05	0.91	18	22	25
SOCIOECONOMIC INDICATORS					
Demographic Index	19%	46%	14	35%	30
Supplemental Demographic Index	11%	17%	34	14%	42
People of Color	9%	58%	4	39%	20
Low Income	30%	34%	48	31%	55
Unemployment Rate	0%	5%	0	6%	0
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	7%	16%	37	12%	46
Under Age 5	13%	6%	89	6%	93
Over Age 64	21%	14%	80	17%	71
Low Life Expectancy	19%	20%	44	20%	50

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 8
Air Pollution 1
Brownfields 0
Toxic Release Inventory 3

Other community features within defined area:

Schools 0
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment ..... Yes
Impaired Waters ..... No

Selected location contains American Indian Reservation Lands* ..... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community ..... No
Selected location contains an EPA IRA disadvantaged community ..... No

Report for Blockgroup: 482450112042

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	20%	44	20%	50
Heart Disease	6.2	5.9	57	6.1	54
Asthma	9.1	9.2	47	10	27
Cancer	5.9	5.2	68	6.1	43
Persons with Disabilities	10.9%	12.3%	45	13.4%	38

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	1%	10%	21	12%	16
Wildfire Risk	99%	30%	92	14%	95

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	8%	15%	41	14%	39
Lack of Health Insurance	12%	18%	33	9%	76
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	No	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450112042

CONFIDENTIAL BUSINESS INFORMATION

EPA

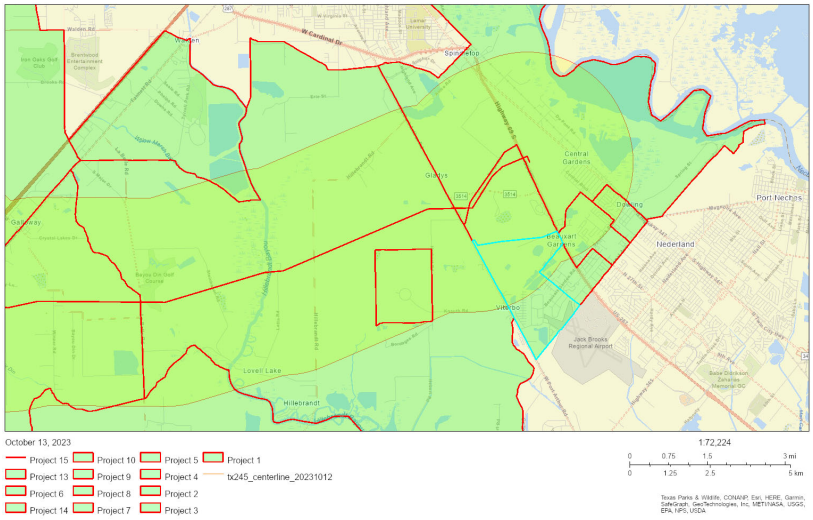
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Nederland, TX

Blockgroup: 482450112043
Population: 2,273
Area in square miles: 2.36

A3 Landscape



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	91%
Spanish	6%
Vietnamese	2%
Other Asian and Pacific Island	1%
Total Non-English	9%

COMMUNITY INFORMATION

- Low income: 18 percent
- People of color: 15 percent
- Less than high school education: 6 percent
- Limited English households: 0 percent
- Unemployment: 5 percent
- Persons with disabilities: 10 percent
- Male: 50 percent
- Female: 50 percent
- 79 years — Average life expectancy
- $32,201 — Per capita income
- Number of households: 876
- Owner occupied: 94 percent

BREAKDOWN BY RACE

- White: 85%
- Black: 0%
- American Indian: 0%
- Asian: 1%
- Hawaiian/Pacific Islander: 0%
- Other race: 0%
- Two or more races: 2%
- Hispanic: 12%

BREAKDOWN BY AGE

From Ages 1 to 4	6%
From Ages 1 to 18	32%
From Ages 18 and up	68%
From Ages 65 and up	18%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

CONFIDENTIAL BUSINESS INFORMATION

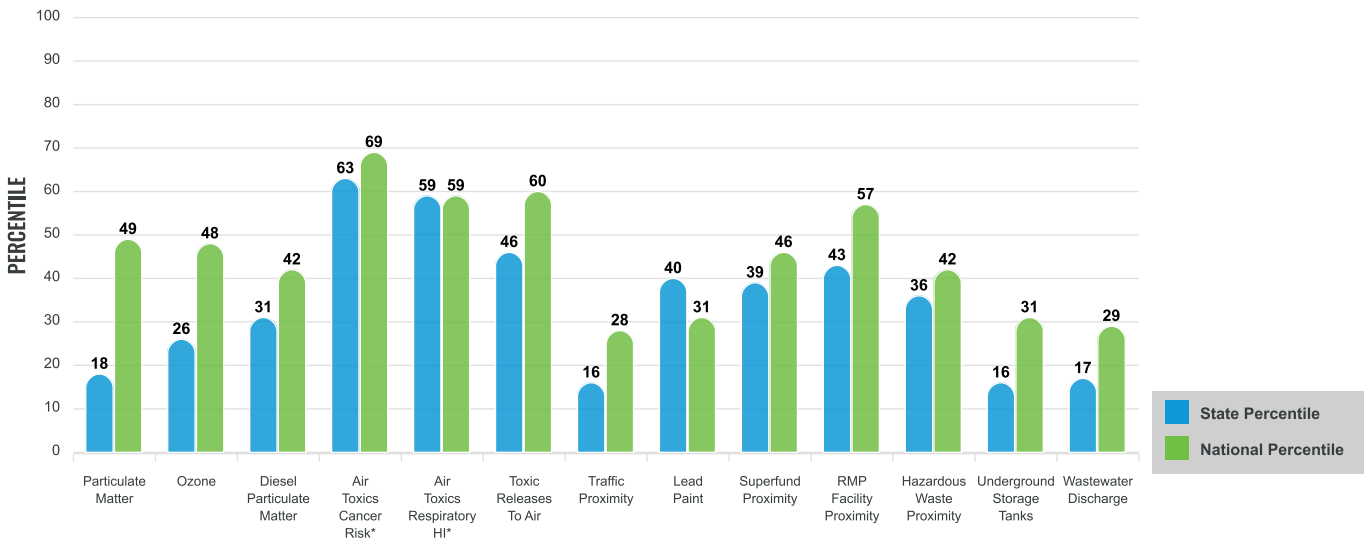
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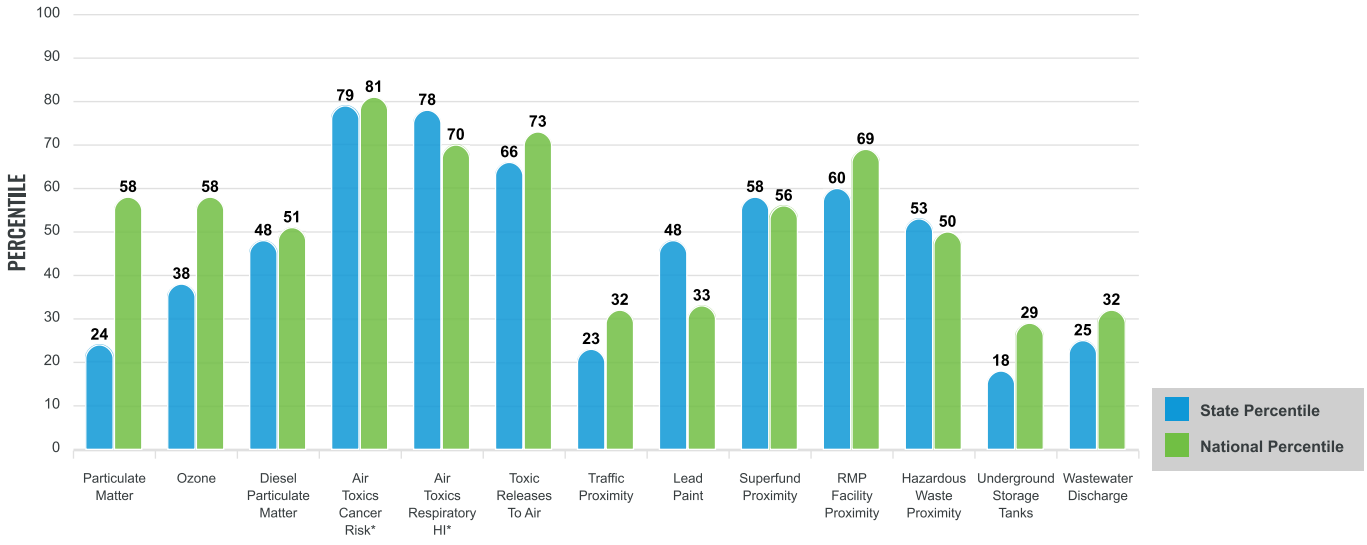
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450112043

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.88	9.11	28	8.08	70
Ozone (ppb)	63.6	64.6	44	61.6	67
Diesel Particulate Matter (µg/m^3)	0.235	0.218	56	0.261	54
Air Toxics Cancer Risk* (lifetime risk per million)	50	28	97	25	94
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	58,000	12,000	95	4,600	98
Traffic Proximity (daily traffic count/distance to road)	32	150	26	210	32
Lead Paint (% Pre-1960 Housing)	0.11	0.17	60	0.3	37
Superfund Proximity (site count/km distance)	0.087	0.085	73	0.13	62
RMP Facility Proximity (facility count/km distance)	1.6	0.63	90	0.43	94
Hazardous Waste Proximity (facility count/km distance)	0.7	0.75	68	1.9	55
Underground Storage Tanks (count/km^2)	0.081	2.3	18	3.9	27
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0002	0.91	30	22	35
SOCIOECONOMIC INDICATORS					
Demographic Index	17%	46%	10	35%	24
Supplemental Demographic Index	10%	17%	26	14%	32
People of Color	15%	58%	9	39%	31
Low Income	18%	34%	29	31%	33
Unemployment Rate	5%	5%	57	6%	55
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	6%	16%	34	12%	42
Under Age 5	6%	6%	55	6%	63
Over Age 64	18%	14%	70	17%	59
Low Life Expectancy	19%	20%	44	20%	50

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	0
Water Dischargers	9
Air Pollution	0
Brownfields	0
Toxic Release Inventory	0

Other community features within defined area:

Schools	0
Hospitals	0
Places of Worship	0

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	No

Report for Blockgroup: 482450112043

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	20%	44	20%	50
Heart Disease	6.2	5.9	57	6.1	54
Asthma	9.1	9.2	47	10	27
Cancer	5.9	5.2	68	6.1	43
Persons with Disabilities	10.9%	12.3%	45	13.4%	38

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	33%	10%	92	12%	92
Wildfire Risk	95%	30%	85	14%	92

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	12%	15%	52	14%	53
Lack of Health Insurance	12%	18%	33	9%	76
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450112043

CONFIDENTIAL BUSINESS INFORMATION

EPA

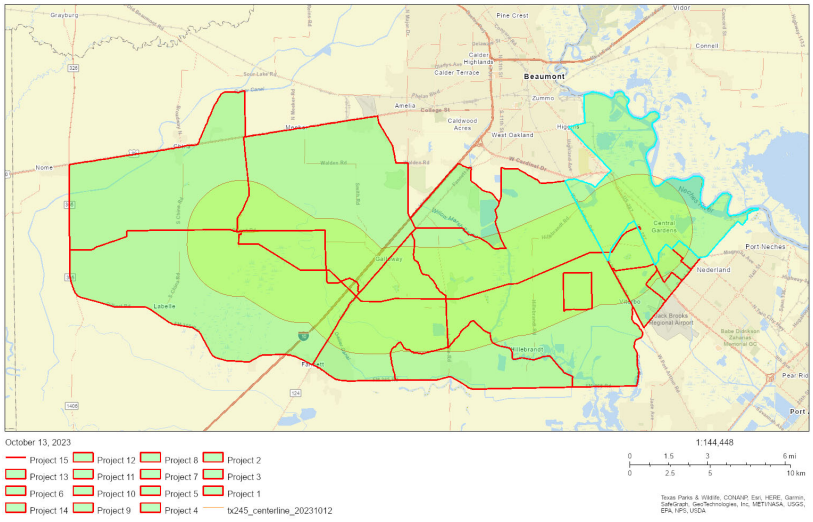
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

Blockgroup: 482450112051
Population: 906
Area in square miles: 20.85

A3 Landscape



COMMUNITY INFORMATION

Low income: 24 percent	People of color: 6 percent	Less than high school education: 5 percent	Limited English households: 0 percent
Unemployment: 3 percent	Persons with disabilities: 9 percent	Male: 61 percent	Female: 39 percent
79 years Average life expectancy	$38,395 Per capita income	Number of households: 511	Owner occupied: 89 percent

BREAKDOWN BY RACE

White: 94%	Black: 5%	American Indian: 0%	Asian: 0%
Hawaiian/Pacific Islander: 0%	Other race: 0%	Two or more races: 0%	Hispanic: 1%

BREAKDOWN BY AGE

From Ages 1 to 4	0%
From Ages 1 to 18	5%
From Ages 18 and up	95%
From Ages 65 and up	6%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	97%
Spanish	2%
French, Haitian, or Cajun	1%
Total Non-English	3%

CONFIDENTIAL BUSINESS INFORMATION

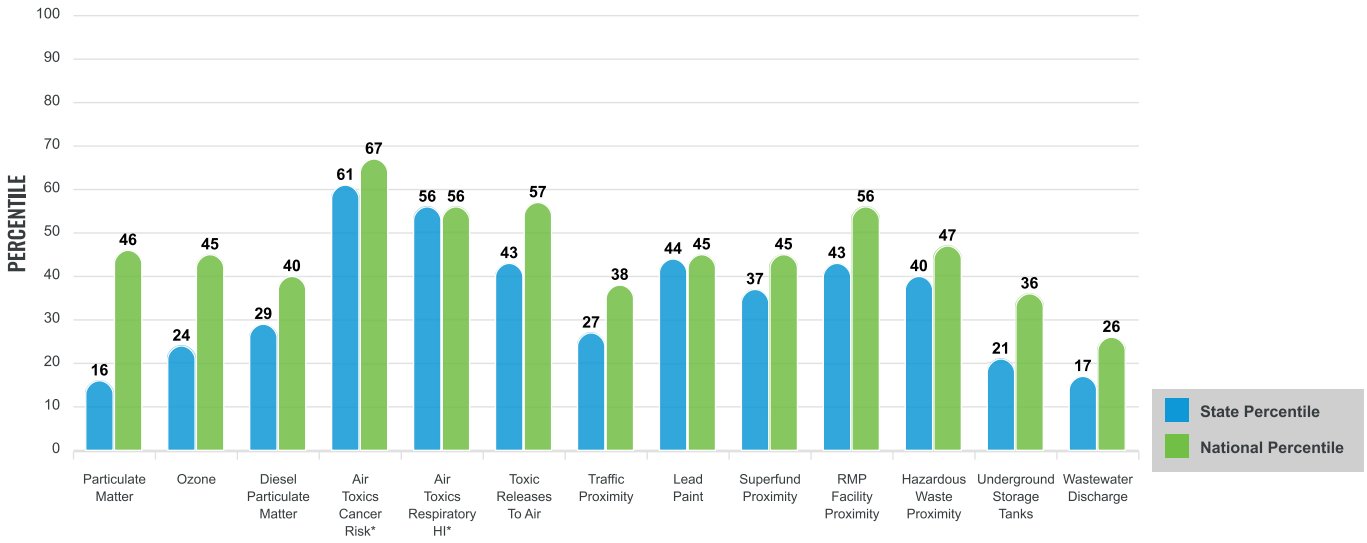
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

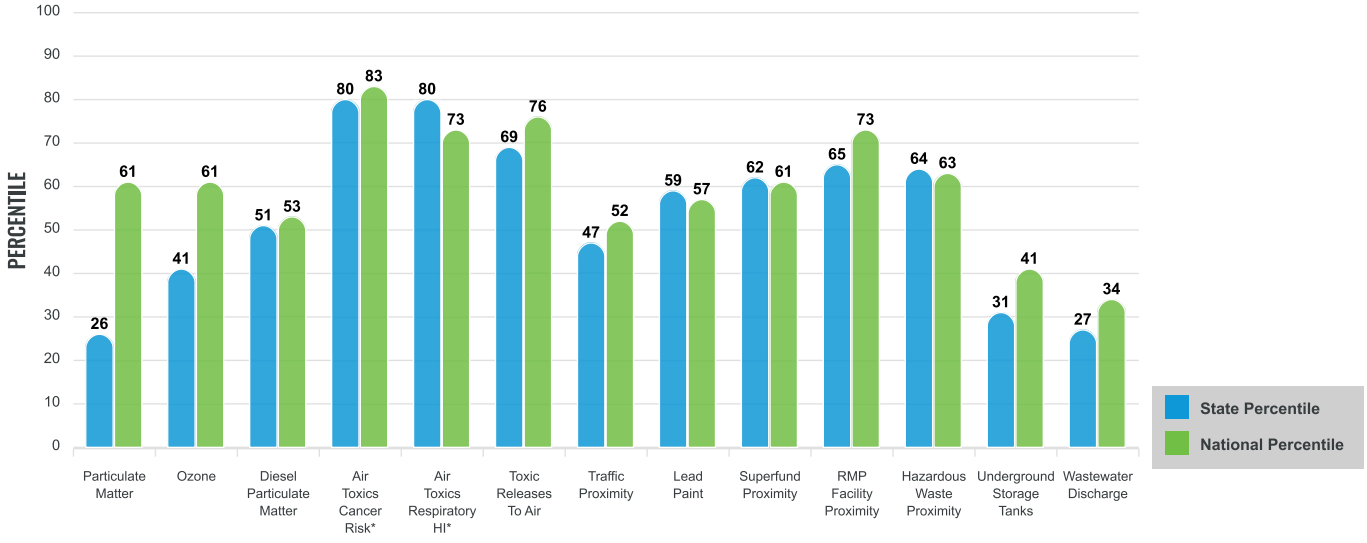
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450112051

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.88	9.11	28	8.08	70
Ozone (ppb)	63.6	64.6	44	61.6	67
Diesel Particulate Matter (µg/m^3)	0.235	0.218	56	0.261	54
Air Toxics Cancer Risk* (lifetime risk per million)	50	28	97	25	94
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	71,000	12,000	96	4,600	99
Traffic Proximity (daily traffic count/distance to road)	99	150	56	210	56
Lead Paint (% Pre-1960 Housing)	0.41	0.17	84	0.3	67
Superfund Proximity (site count/km distance)	0.096	0.085	76	0.13	65
RMP Facility Proximity (facility count/km distance)	4.8	0.63	99	0.43	99
Hazardous Waste Proximity (facility count/km distance)	1.9	0.75	89	1.9	73
Underground Storage Tanks (count/km^2)	0.52	2.3	31	3.9	40
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.00021	0.91	31	22	35
SOCIOECONOMIC INDICATORS					
Demographic Index	15%	46%	9	35%	21
Supplemental Demographic Index	10%	17%	30	14%	36
People of Color	6%	58%	3	39%	16
Low Income	24%	34%	38	31%	44
Unemployment Rate	3%	5%	49	6%	46
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	5%	16%	29	12%	35
Under Age 5	0%	6%	0	6%	0
Over Age 64	6%	14%	22	17%	13
Low Life Expectancy	19%	20%	44	20%	50

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	8
Water Dischargers	83
Air Pollution	23
Brownfields	0
Toxic Release Inventory	20

Other community features within defined area:

Schools	0
Hospitals	0
Places of Worship	0

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	No

Report for Blockgroup: 482450112051

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	20%	44	20%	50
Heart Disease	6.2	5.9	57	6.1	54
Asthma	9.1	9.2	47	10	27
Cancer	5.9	5.2	68	6.1	43
Persons with Disabilities	9.6%	12.3%	36	13.4%	29

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	25%	10%	90	12%	89
Wildfire Risk	66%	30%	72	14%	87

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	7%	15%	39	14%	37
Lack of Health Insurance	5%	18%	8	9%	34
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	Yes	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450112051

CONFIDENTIAL BUSINESS INFORMATION

EPA

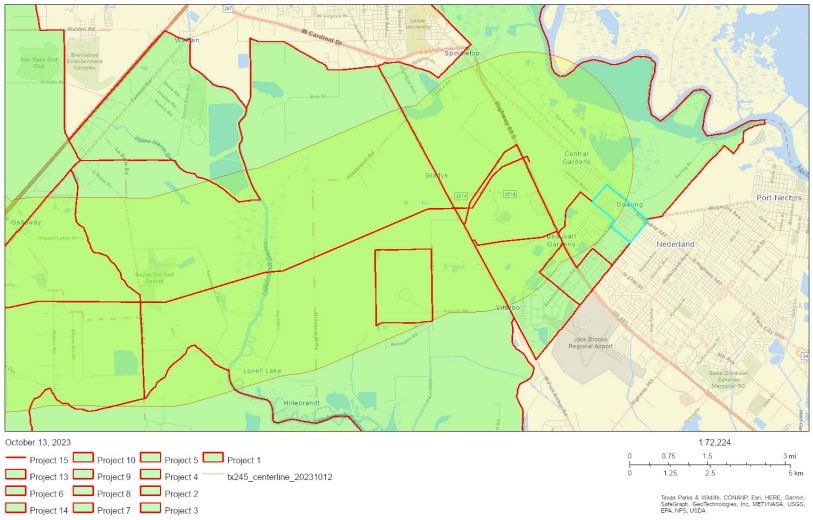
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Central Gardens, TX

Blockgroup: 482450112052
Population: 972
Area in square miles: 0.52

A3 Landscape



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	97%
Spanish	2%
French, Haitian, or Cajun	1%
Total Non-English	3%

COMMUNITY INFORMATION

Low income: 6 percent
People of color: 18 percent
Less than high school education: 0 percent
Limited English households: 0 percent
Unemployment: 7 percent
Persons with disabilities: 9 percent
Male: 55 percent
Female: 45 percent
79 years — Average life expectancy
$36,170 — Per capita income
Number of households: 351
Owner occupied: 89 percent

BREAKDOWN BY RACE

White: 82%
Black: 0%
American Indian: 0%
Asian: 0%
Hawaiian/Pacific Islander: 0%
Other race: 0%
Two or more races: 0%
Hispanic: 18%

BREAKDOWN BY AGE

From Ages 1 to 4	0%
From Ages 1 to 18	35%
From Ages 18 and up	65%
From Ages 65 and up	18%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

CONFIDENTIAL BUSINESS INFORMATION

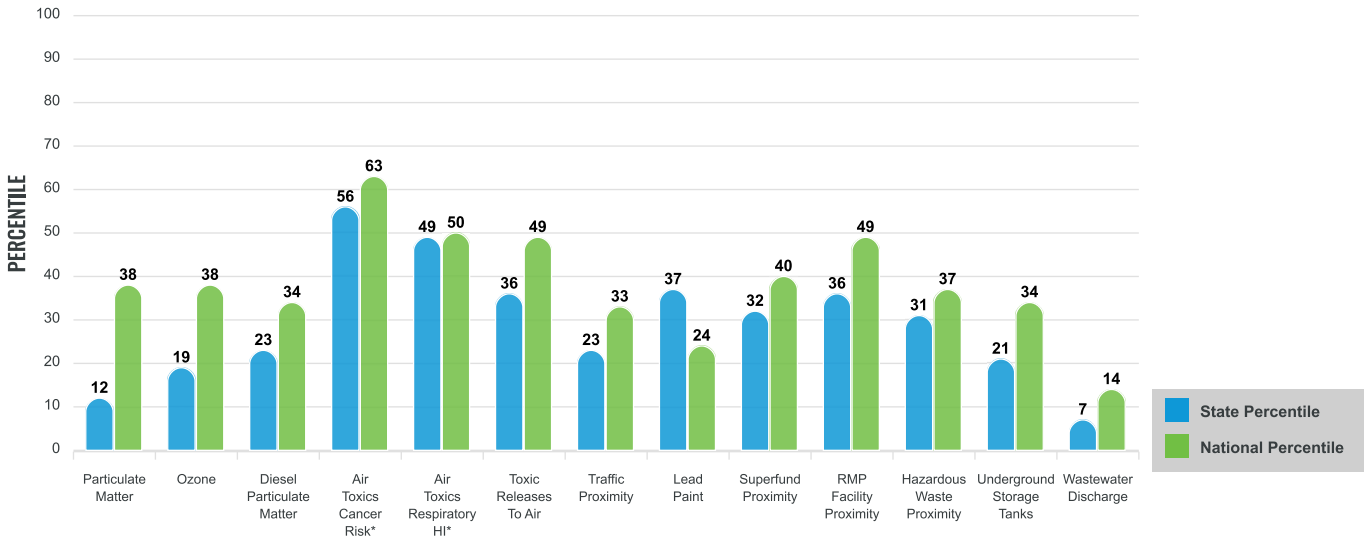
Environmental Justice & Supplemental Indexes

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EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

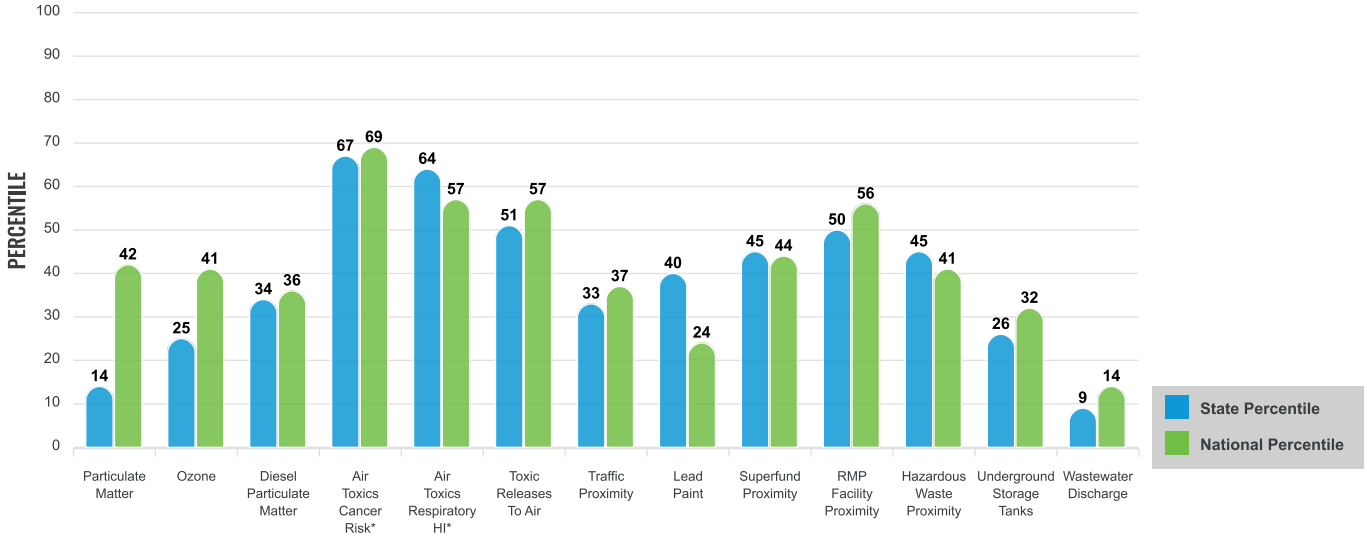
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450112052

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.88	9.11	28	8.08	70
Ozone (ppb)	63.6	64.6	44	61.6	67
Diesel Particulate Matter (µg/m^3)	0.235	0.218	56	0.261	54
Air Toxics Cancer Risk* (lifetime risk per million)	50	28	97	25	94
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	92,000	12,000	97	4,600	99
Traffic Proximity (daily traffic count/distance to road)	100	150	57	210	57
Lead Paint (% Pre-1960 Housing)	0.11	0.17	60	0.3	36
Superfund Proximity (site count/km distance)	0.11	0.085	79	0.13	69
RMP Facility Proximity (facility count/km distance)	3.6	0.63	98	0.43	99
Hazardous Waste Proximity (facility count/km distance)	1.1	0.75	79	1.9	63
Underground Storage Tanks (count/km^2)	0.92	2.3	40	3.9	46
Wastewater Discharge (toxicity-weighted concentration/m distance)	2.8E-05	0.91	15	22	22
SOCIOECONOMIC INDICATORS					
Demographic Index	12%	46%	5	35%	14
Supplemental Demographic Index	6%	17%	11	14%	13
People of Color	18%	58%	11	39%	35
Low Income	6%	34%	10	31%	10
Unemployment Rate	7%	5%	70	6%	69
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	0%	16%	0	12%	0
Under Age 5	0%	6%	0	6%	0
Over Age 64	18%	14%	72	17%	61
Low Life Expectancy	19%	20%	44	20%	50

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	0
Water Dischargers	1
Air Pollution	0
Brownfields	0
Toxic Release Inventory	0

Other community features within defined area:

Schools	0
Hospitals	0
Places of Worship	0

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	No

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	No

Report for Blockgroup: 482450112052

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	20%	44	20%	50
Heart Disease	6.2	5.9	57	6.1	54
Asthma	9.1	9.2	47	10	27
Cancer	5.9	5.2	68	6.1	43
Persons with Disabilities	9.6%	12.3%	36	13.4%	29

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	14%	10%	82	12%	76
Wildfire Risk	100%	30%	95	14%	97

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	5%	15%	31	14%	28
Lack of Health Insurance	5%	18%	7	9%	33
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	No	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450112052

CONFIDENTIAL BUSINESS INFORMATION

EPA

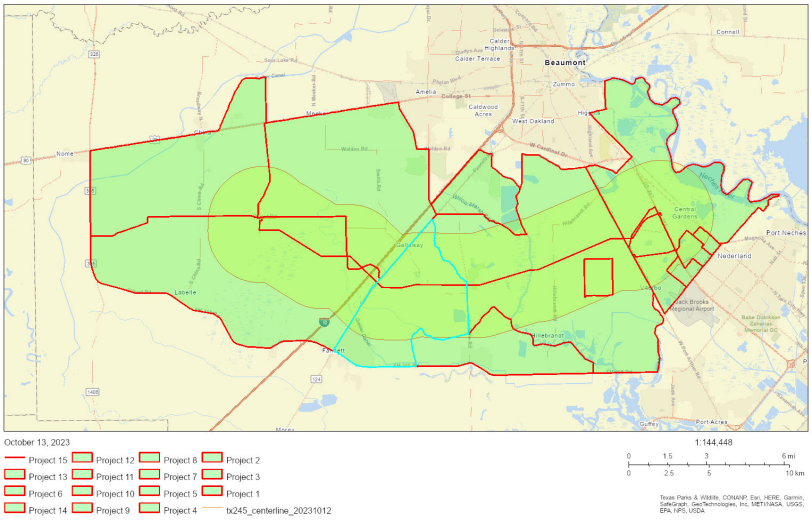
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

Blockgroup: 482450113041
Population: 2,367
Area in square miles: 15.59

A3 Landscape



COMMUNITY INFORMATION

Low income: 25 percent	People of color: 45 percent	Less than high school education: 9 percent	Limited English households: 19 percent
Unemployment: 2 percent	Persons with disabilities: 19 percent	Male: 55 percent	Female: 45 percent
76 years Average life expectancy	$32,724 Per capita income	Number of households: 1,017	Owner occupied: 59 percent

BREAKDOWN BY RACE

White: 55%	Black: 16%	American Indian: 0%	Asian: 9%
Hawaiian/Pacific Islander: 0%	Other race: 0%	Two or more races: 2%	Hispanic: 18%

BREAKDOWN BY AGE

From Ages 1 to 4	6%
From Ages 1 to 18	21%
From Ages 18 and up	79%
From Ages 65 and up	14%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	87%
Speak Other Indo-European Languages	13%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	72%
Spanish	22%
French, Haitian, or Cajun	1%
German or other West Germanic	1%
Russian, Polish, or Other Slavic	1%
Vietnamese	1%
Other and Unspecified	1%
Total Non-English	28%

CONFIDENTIAL BUSINESS INFORMATION

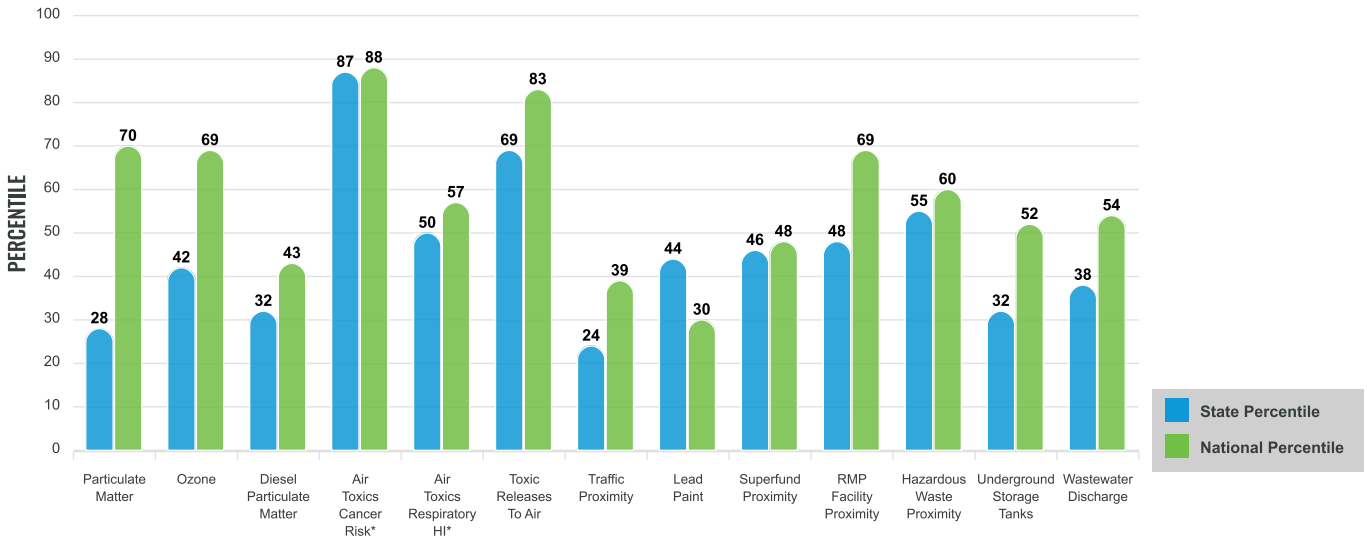
Environmental Justice & Supplemental Indexes

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EJ INDEXES

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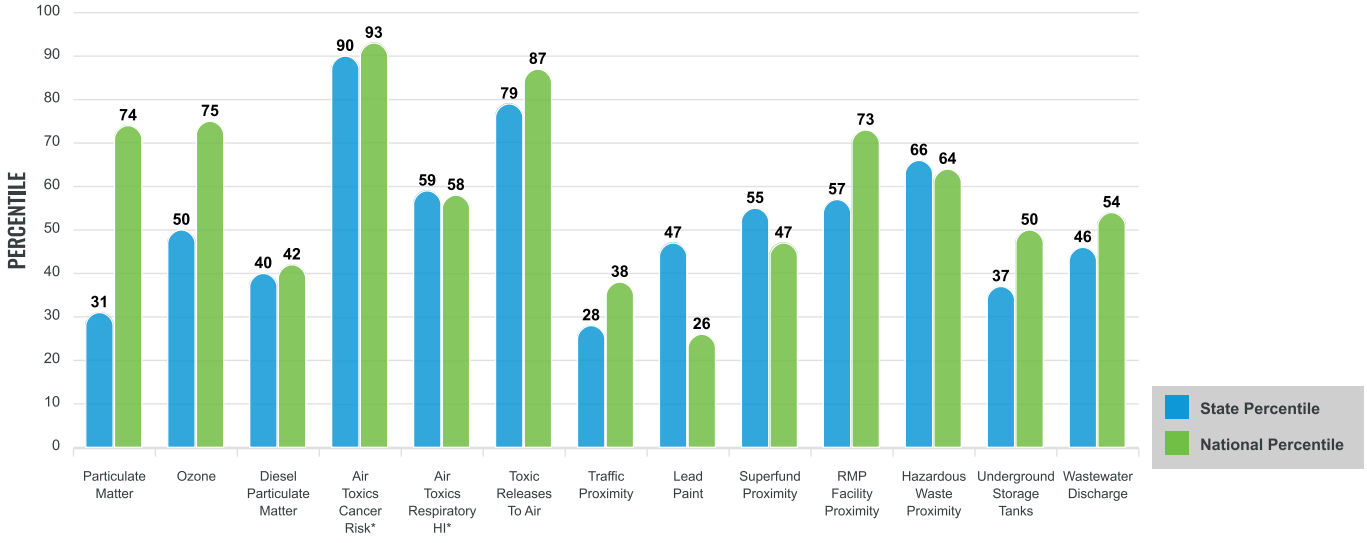
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450113041

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.73	9.11	22	8.08	65
Ozone (ppb)	63	64.6	37	61.6	63
Diesel Particulate Matter (µg/m^3)	0.137	0.218	28	0.261	27
Air Toxics Cancer Risk* (lifetime risk per million)	50	28	97	25	94
Air Toxics Respiratory HI*	0.3	0.3	29	0.31	31
Toxic Releases to Air	21,000	12,000	84	4,600	96
Traffic Proximity (daily traffic count/distance to road)	21	150	20	210	25
Lead Paint (% Pre-1960 Housing)	0.014	0.17	36	0.3	17
Superfund Proximity (site count/km distance)	0.034	0.085	43	0.13	31
RMP Facility Proximity (facility count/km distance)	0.29	0.63	51	0.43	67
Hazardous Waste Proximity (facility count/km distance)	0.55	0.75	63	1.9	51
Underground Storage Tanks (count/km^2)	0.31	2.3	26	3.9	35
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.00036	0.91	36	22	40
SOCIOECONOMIC INDICATORS					
Demographic Index	35%	46%	37	35%	58
Supplemental Demographic Index	15%	17%	52	14%	62
People of Color	45%	58%	37	39%	63
Low Income	25%	34%	40	31%	46
Unemployment Rate	2%	5%	39	6%	36
Limited English Speaking Households	19%	8%	86	5%	92
Less Than High School Education	9%	16%	41	12%	52
Under Age 5	6%	6%	51	6%	59
Over Age 64	14%	14%	59	17%	45
Low Life Expectancy	22%	20%	76	20%	76

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 11
Air Pollution 0
Brownfields 0
Toxic Release Inventory 3

Other community features within defined area:

Schools 0
Hospitals 0
Places of Worship 1

Other environmental data:

Air Non-attainment ..... Yes
Impaired Waters ..... Yes

Selected location contains American Indian Reservation Lands* ..... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community ..... No
Selected location contains an EPA IRA disadvantaged community ..... Yes

Report for Blockgroup: 482450113041

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	22%	20%	76	20%	76
Heart Disease	5.3	5.9	39	6.1	35
Asthma	8.1	9.2	12	10	7
Cancer	4.5	5.2	36	6.1	18
Persons with Disabilities	16.6%	12.3%	78	13.4%	73

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	11%	10%	77	12%	69
Wildfire Risk	78%	30%	75	14%	88

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	16%	15%	63	14%	66
Lack of Health Insurance	15%	18%	42	9%	83
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450113041

CONFIDENTIAL BUSINESS INFORMATION

EPA

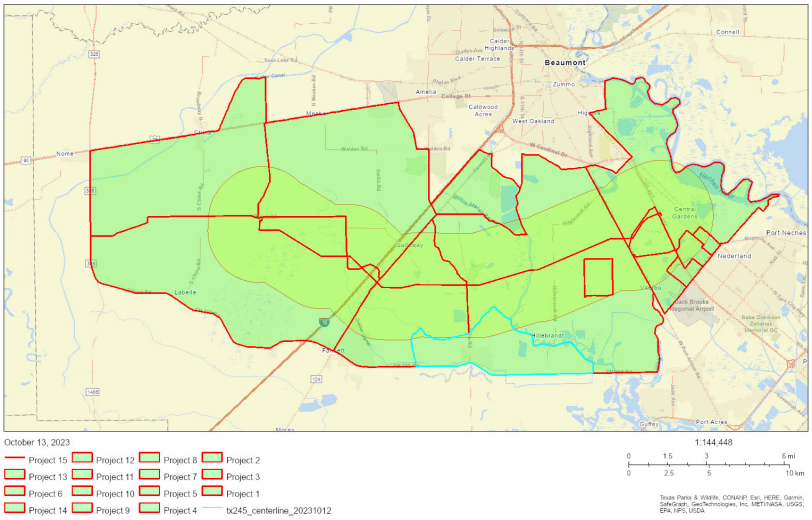
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

Blockgroup: 482450113042
Population: 1,482
Area in square miles: 9.61

A3 Landscape



COMMUNITY INFORMATION

Low income: 15 percent	People of color: 4 percent	Less than high school education: 1 percent	Limited English households: 0 percent
Unemployment: 2 percent	Persons with disabilities: 13 percent	Male: 44 percent	Female: 56 percent
76 years Average life expectancy	$35,107 Per capita income	Number of households: 480	Owner occupied: 80 percent

BREAKDOWN BY RACE

White: 96%	Black: 0%	American Indian: 0%	Asian: 1%
Hawaiian/Pacific Islander: 0%	Other race: 0%	Two or more races: 2%	Hispanic: 1%

BREAKDOWN BY AGE

From Ages 1 to 4	7%
From Ages 1 to 18	23%
From Ages 18 and up	77%
From Ages 65 and up	7%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	72%
Spanish	22%
French, Haitian, or Cajun	1%
German or other West Germanic	1%
Russian, Polish, or Other Slavic	1%
Vietnamese	1%
Other and Unspecified	1%
Total Non-English	28%

CONFIDENTIAL BUSINESS INFORMATION

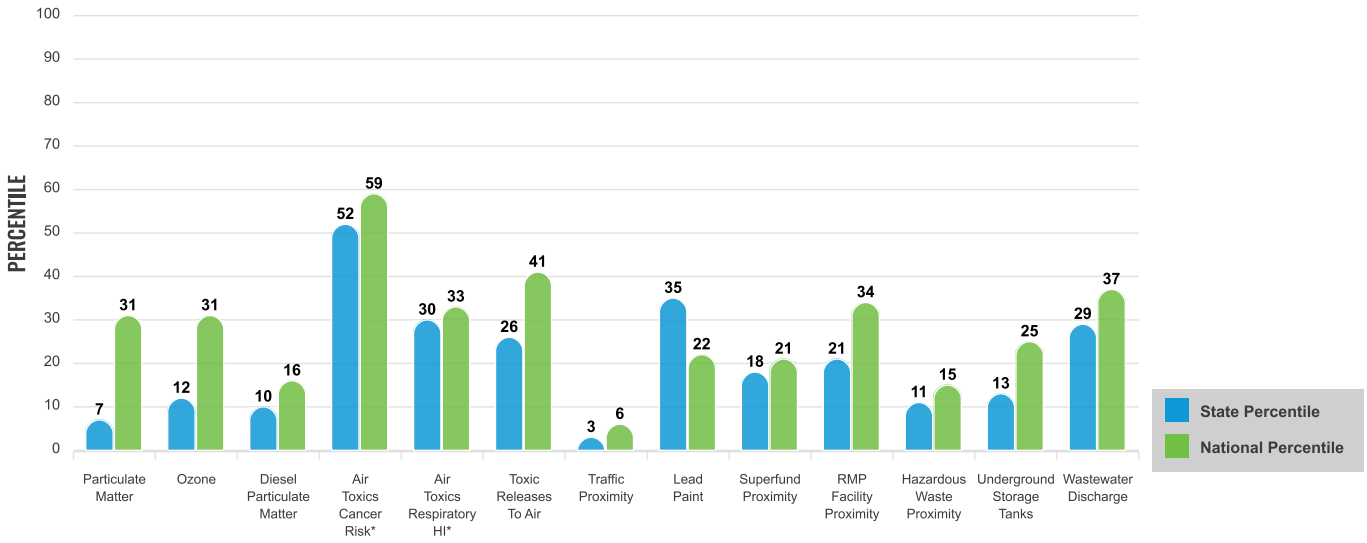
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

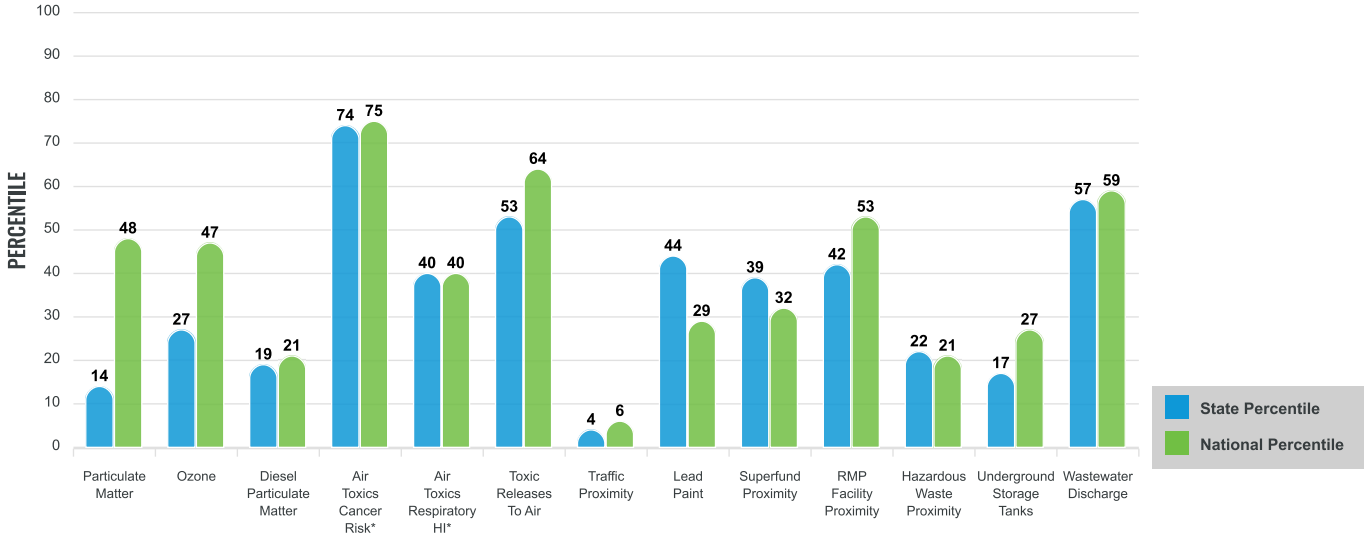
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450113042

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.73	9.11	22	8.08	65
Ozone (ppb)	63	64.6	37	61.6	63
Diesel Particulate Matter (µg/m^3)	0.137	0.218	28	0.261	27
Air Toxics Cancer Risk* (lifetime risk per million)	50	28	97	25	94
Air Toxics Respiratory HI*	0.3	0.3	29	0.31	31
Toxic Releases to Air	15,000	12,000	82	4,600	95
Traffic Proximity (daily traffic count/distance to road)	2.7	150	5	210	8
Lead Paint (% Pre-1960 Housing)	0.11	0.17	60	0.3	37
Superfund Proximity (site count/km distance)	0.047	0.085	54	0.13	41
RMP Facility Proximity (facility count/km distance)	0.42	0.63	59	0.43	73
Hazardous Waste Proximity (facility count/km distance)	0.13	0.75	28	1.9	25
Underground Storage Tanks (count/km^2)	0.13	2.3	20	3.9	29
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.26	0.91	93	22	86
SOCIOECONOMIC INDICATORS					
Demographic Index	9%	46%	3	35%	9
Supplemental Demographic Index	8%	17%	19	14%	22
People of Color	4%	58%	2	39%	10
Low Income	15%	34%	25	31%	28
Unemployment Rate	2%	5%	33	6%	29
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	1%	16%	12	12%	12
Under Age 5	7%	6%	59	6%	66
Over Age 64	7%	14%	25	17%	15
Low Life Expectancy	22%	20%	76	20%	76

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 0
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 0
Hospitals 0
Places of Worship 1

Other environmental data:

Air Non-attainment ..... Yes
Impaired Waters ..... Yes

Selected location contains American Indian Reservation Lands* ..... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community ..... No
Selected location contains an EPA IRA disadvantaged community ..... No

Report for Blockgroup: 482450113042

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	22%	20%	76	20%	76
Heart Disease	5.3	5.9	39	6.1	35
Asthma	8.1	9.2	12	10	7
Cancer	4.5	5.2	36	6.1	18
Persons with Disabilities	16.6%	12.3%	78	13.4%	73

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	77%	10%	97	12%	97
Wildfire Risk	85%	30%	78	14%	90

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	1%	15%	17	14%	13
Lack of Health Insurance	15%	18%	42	9%	83
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450113042

CONFIDENTIAL BUSINESS INFORMATION

EPA

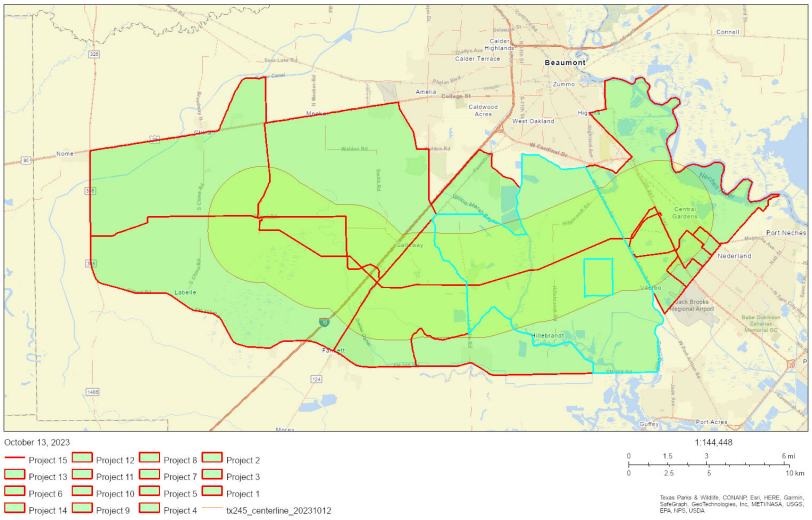
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

Blockgroup: 482450113043
Population: 2,330
Area in square miles: 40.90

A3 Landscape



COMMUNITY INFORMATION

Low income: 50 percent	People of color: 76 percent	Less than high school education: 26 percent	Limited English households: 0 percent
Unemployment: 0 percent	Persons with disabilities: 4 percent	Male: 93 percent	Female: 7 percent
76 years Average life expectancy	$14,211 Per capita income	Number of households: 236	Owner occupied: 100 percent

BREAKDOWN BY RACE

White: 24%	Black: 37%	American Indian: 0%	Asian: 1%
Hawaiian/Pacific Islander: 0%	Other race: 0%	Two or more races: 0%	Hispanic: 39%

BREAKDOWN BY AGE

From Ages 1 to 4	0%
From Ages 1 to 18	0%
From Ages 18 and up	100%
From Ages 65 and up	4%

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	72%
Spanish	22%
French, Haitian, or Cajun	1%
German or other West Germanic	1%
Russian, Polish, or Other Slavic	1%
Vietnamese	1%
Other and Unspecified	1%
Total Non-English	28%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

CONFIDENTIAL BUSINESS INFORMATION

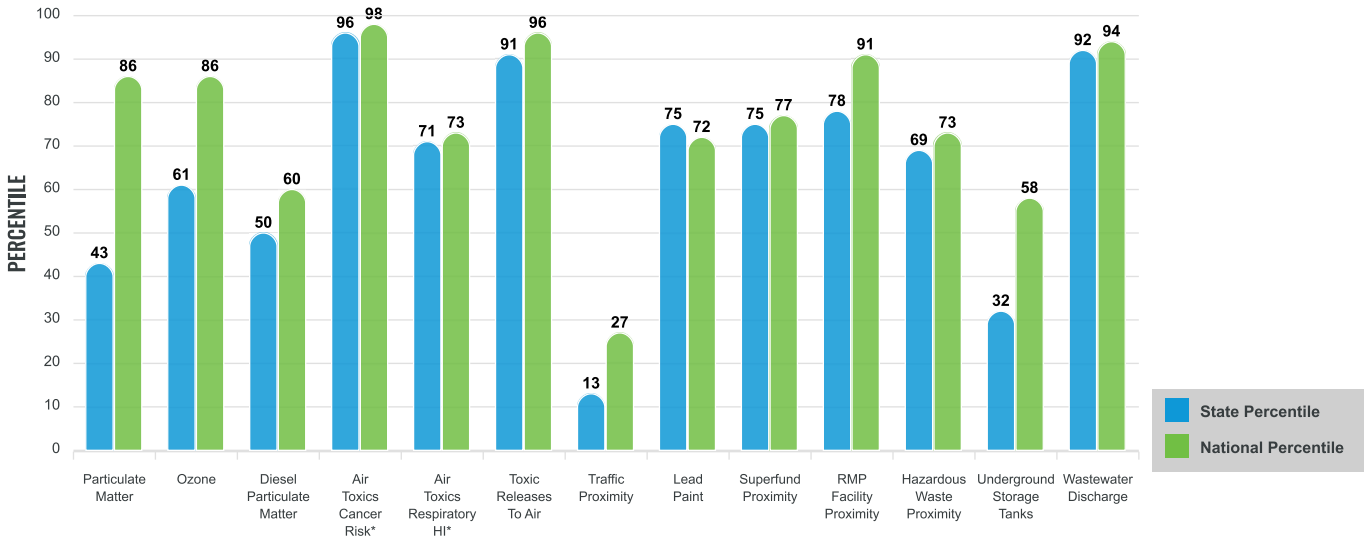
Environmental Justice & Supplemental Indexes

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EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

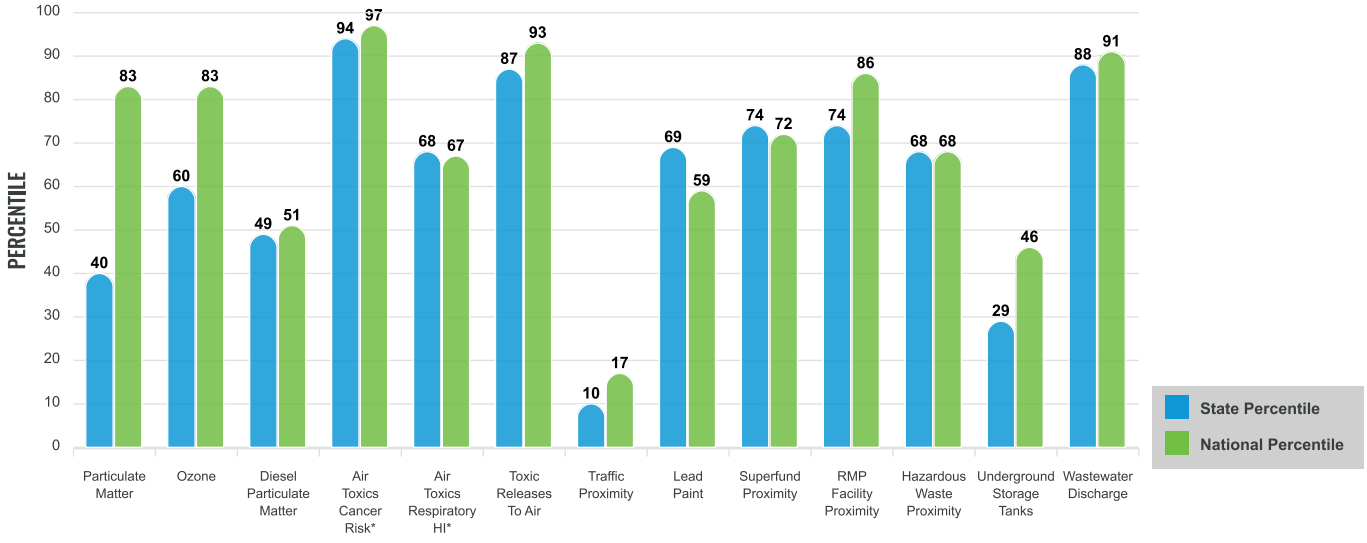
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450113043

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.73	9.11	22	8.08	65
Ozone (ppb)	63	64.6	37	61.6	63
Diesel Particulate Matter (µg/m^3)	0.137	0.218	28	0.261	27
Air Toxics Cancer Risk* (lifetime risk per million)	50	28	97	25	94
Air Toxics Respiratory HI*	0.3	0.3	29	0.31	31
Toxic Releases to Air	29,000	12,000	88	4,600	97
Traffic Proximity (daily traffic count/distance to road)	2.7	150	5	210	8
Lead Paint (% Pre-1960 Housing)	0.11	0.17	60	0.3	37
Superfund Proximity (site count/km distance)	0.054	0.085	59	0.13	46
RMP Facility Proximity (facility count/km distance)	0.61	0.63	68	0.43	80
Hazardous Waste Proximity (facility count/km distance)	0.33	0.75	53	1.9	44
Underground Storage Tanks (count/km^2)	0.037	2.3	15	3.9	24
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.34	0.91	94	22	88
SOCIOECONOMIC INDICATORS					
Demographic Index	63%	46%	72	35%	85
Supplemental Demographic Index	20%	17%	66	14%	77
People of Color	76%	58%	65	39%	81
Low Income	50%	34%	74	31%	81
Unemployment Rate	0%	5%	0	6%	0
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	26%	16%	75	12%	88
Under Age 5	0%	6%	0	6%	0
Over Age 64	4%	14%	12	17%	7
Low Life Expectancy	22%	20%	76	20%	76

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	1
Water Dischargers	34
Air Pollution	8
Brownfields	0
Toxic Release Inventory	4

Other community features within defined area:

Schools	0
Hospitals	0
Places of Worship	1

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	Yes

Report for Blockgroup: 482450113043

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	22%	20%	76	20%	76
Heart Disease	5.3	5.9	39	6.1	35
Asthma	8.1	9.2	12	10	7
Cancer	4.5	5.2	36	6.1	18
Persons with Disabilities	16.6%	12.3%	78	13.4%	73

CLIMATE INDICATORS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	49%	10%	95	12%	95
Wildfire Risk	35%	30%	65	14%	84

CRITICAL SERVICE GAPS					
INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	56%	15%	98	14%	98
Lack of Health Insurance	15%	18%	42	9%	83
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450113043

CONFIDENTIAL BUSINESS INFORMATION

EPA

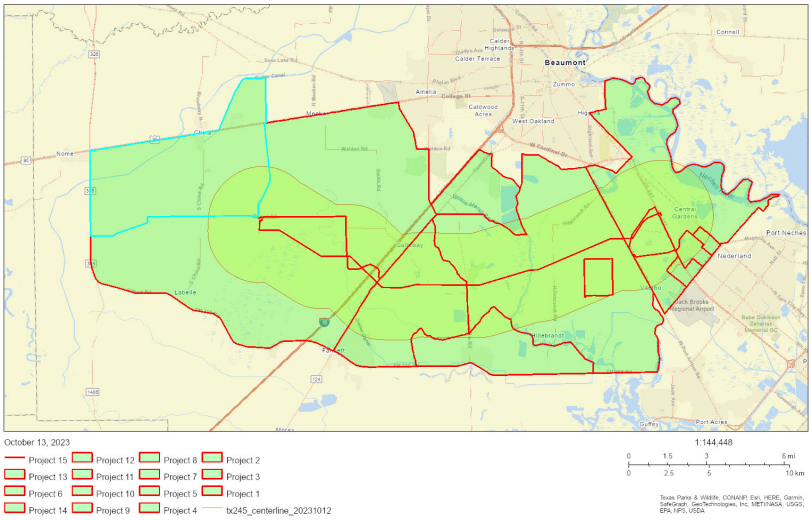
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

Blockgroup: 482450114013
Population: 765
Area in square miles: 24.50

A3 Landscape



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	94%
Spanish	4%
French, Haitian, or Cajun	1%
Vietnamese	1%
Total Non-English	6%

COMMUNITY INFORMATION

- Low income: 22 percent
- People of color: 40 percent
- Less than high school education: 11 percent
- Limited English households: 0 percent
- Unemployment: 1 percent
- Persons with disabilities: 22 percent
- Male: 37 percent
- Female: 63 percent
- 79 years — Average life expectancy
- $33,974 — Per capita income
- Number of households: 324
- Owner occupied: 87 percent

BREAKDOWN BY RACE

- White: 60%
- Black: 33%
- American Indian: 0%
- Asian: 1%
- Hawaiian/Pacific Islander: 0%
- Other race: 0%
- Two or more races: 1%
- Hispanic: 6%

BREAKDOWN BY AGE

From Ages 1 to 4	0%
From Ages 1 to 18	18%
From Ages 18 and up	82%
From Ages 65 and up	22%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

CONFIDENTIAL BUSINESS INFORMATION

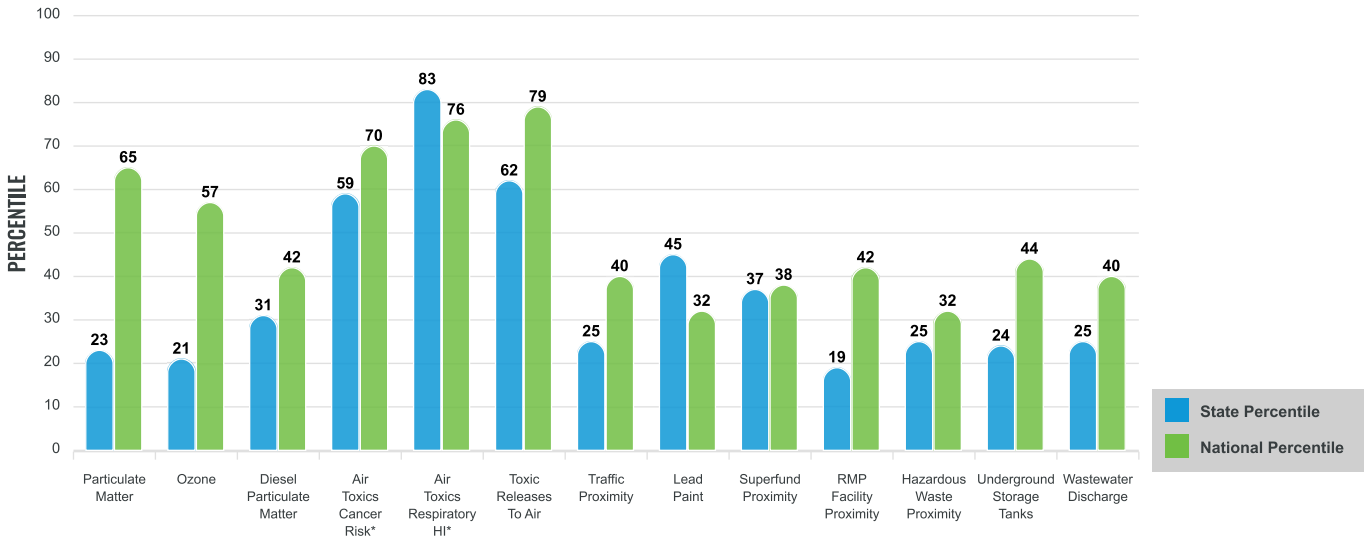
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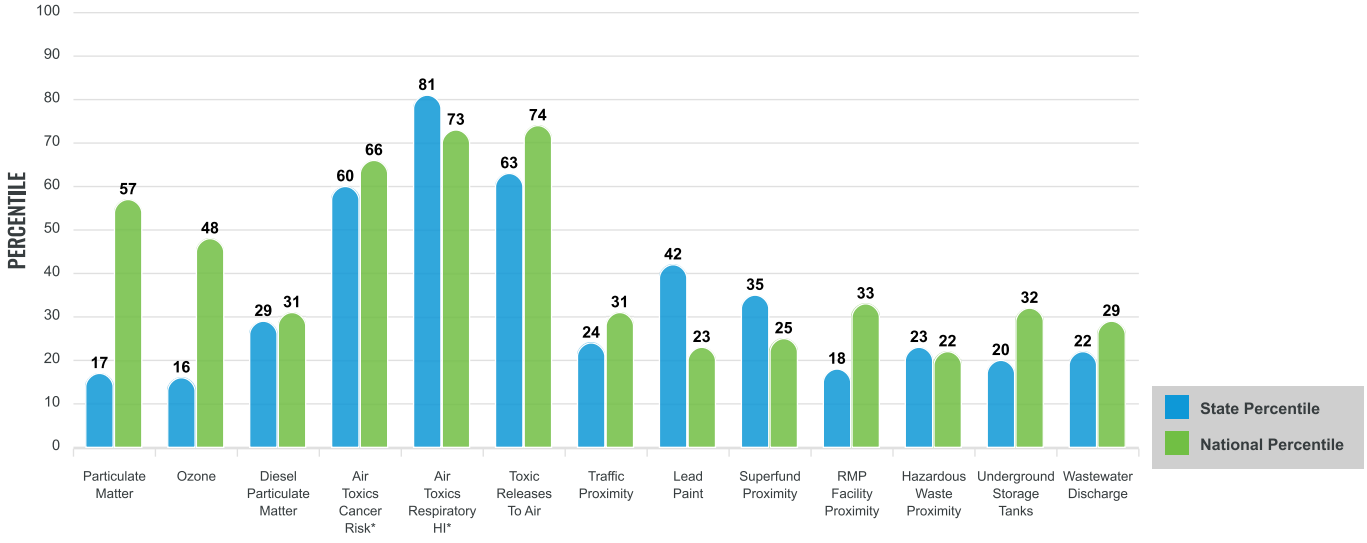
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450114013

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.66	9.11	20	8.08	63
Ozone (ppb)	61	64.6	19	61.6	49
Diesel Particulate Matter (µg/m^3)	0.143	0.218	30	0.261	29
Air Toxics Cancer Risk* (lifetime risk per million)	30	28	44	25	52
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	12,000	12,000	80	4,600	94
Traffic Proximity (daily traffic count/distance to road)	28	150	24	210	29
Lead Paint (% Pre-1960 Housing)	0.03	0.17	42	0.3	21
Superfund Proximity (site count/km distance)	0.027	0.085	37	0.13	25
RMP Facility Proximity (facility count/km distance)	0.1	0.63	16	0.43	30
Hazardous Waste Proximity (facility count/km distance)	0.1	0.75	22	1.9	20
Underground Storage Tanks (count/km^2)	0.11	2.3	19	3.9	28
Wastewater Discharge (toxicity-weighted concentration/m distance)	8.7E-05	0.91	24	22	29
SOCIOECONOMIC INDICATORS					
Demographic Index	31%	46%	31	35%	52
Supplemental Demographic Index	10%	17%	30	14%	37
People of Color	40%	58%	32	39%	58
Low Income	22%	34%	35	31%	41
Unemployment Rate	1%	5%	30	6%	26
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	11%	16%	47	12%	60
Under Age 5	0%	6%	0	6%	0
Over Age 64	22%	14%	82	17%	74
Low Life Expectancy	19%	20%	37	20%	44

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	0
Water Dischargers	3
Air Pollution	0
Brownfields	0
Toxic Release Inventory	0

Other community features within defined area:

Schools	1
Hospitals	0
Places of Worship	0

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	No

Report for Blockgroup: 482450114013

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	20%	37	20%	44
Heart Disease	6.5	5.9	62	6.1	60
Asthma	9.1	9.2	47	10	27
Cancer	6.7	5.2	81	6.1	62
Persons with Disabilities	17.8%	12.3%	82	13.4%	78

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	27%	10%	91	12%	90
Wildfire Risk	56%	30%	70	14%	86

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	17%	15%	64	14%	67
Lack of Health Insurance	12%	18%	33	9%	76
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450114013

CONFIDENTIAL BUSINESS INFORMATION

EPA

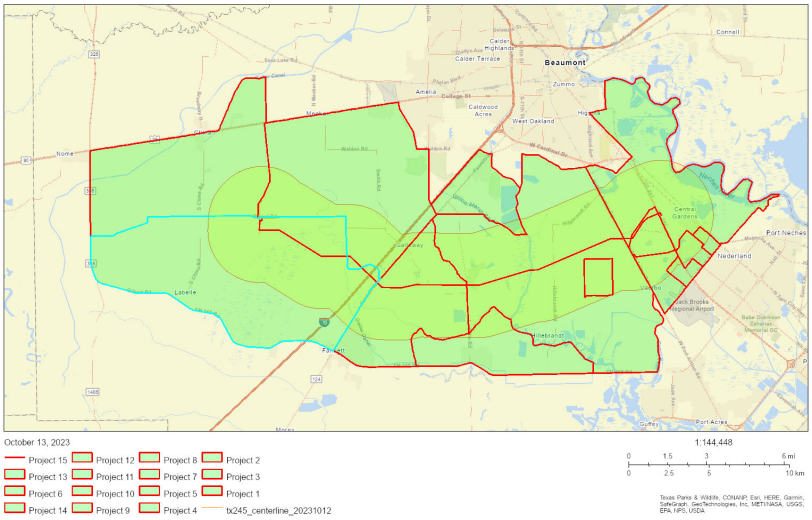
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

Blockgroup: 482450114021
Population: 471
Area in square miles: 39.48

A3 Landscape



COMMUNITY INFORMATION

Low income: 17 percent	People of color: 56 percent	Less than high school education: 3 percent	Limited English households: 0 percent
Unemployment: 0 percent	Persons with disabilities: 21 percent	Male: 40 percent	Female: 60 percent
79 years Average life expectancy	$35,083 Per capita income	Number of households: 185	Owner occupied: 100 percent

BREAKDOWN BY RACE

White: 44%	Black: 28%	American Indian: 0%	Asian: 0%
Hawaiian/Pacific Islander: 0%	Other race: 0%	Two or more races: 0%	Hispanic: 28%

BREAKDOWN BY AGE

From Ages 1 to 4	0%
From Ages 1 to 18	17%
From Ages 18 and up	83%
From Ages 65 and up	13%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	73%
Spanish	24%
Other Indo-European	2%
Total Non-English	27%

CONFIDENTIAL BUSINESS INFORMATION

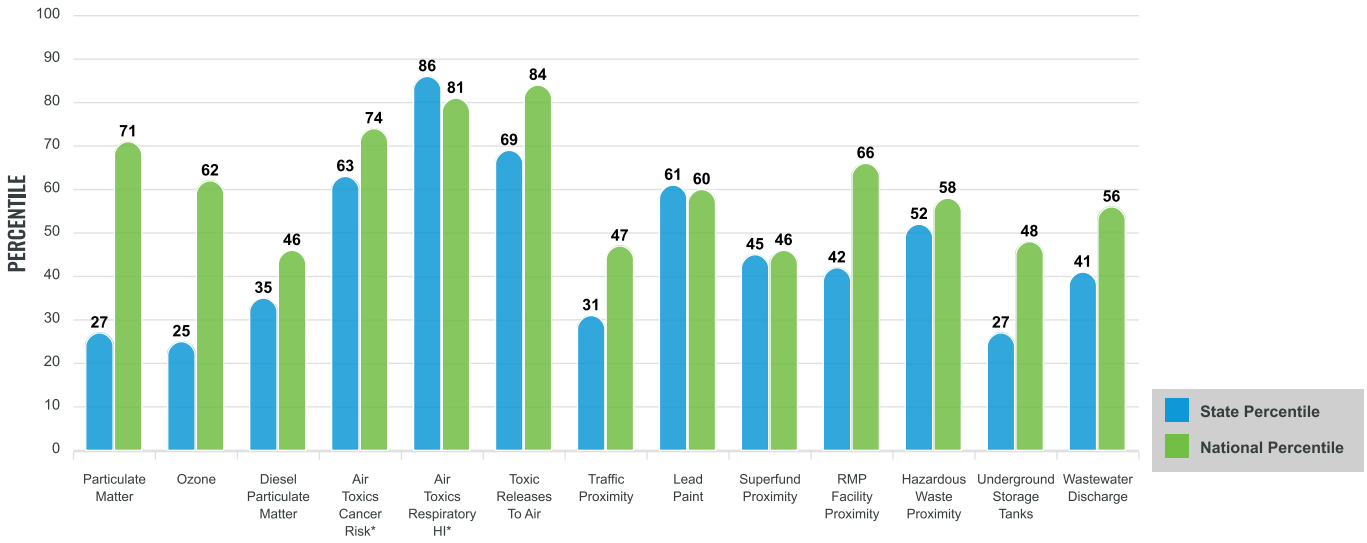
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

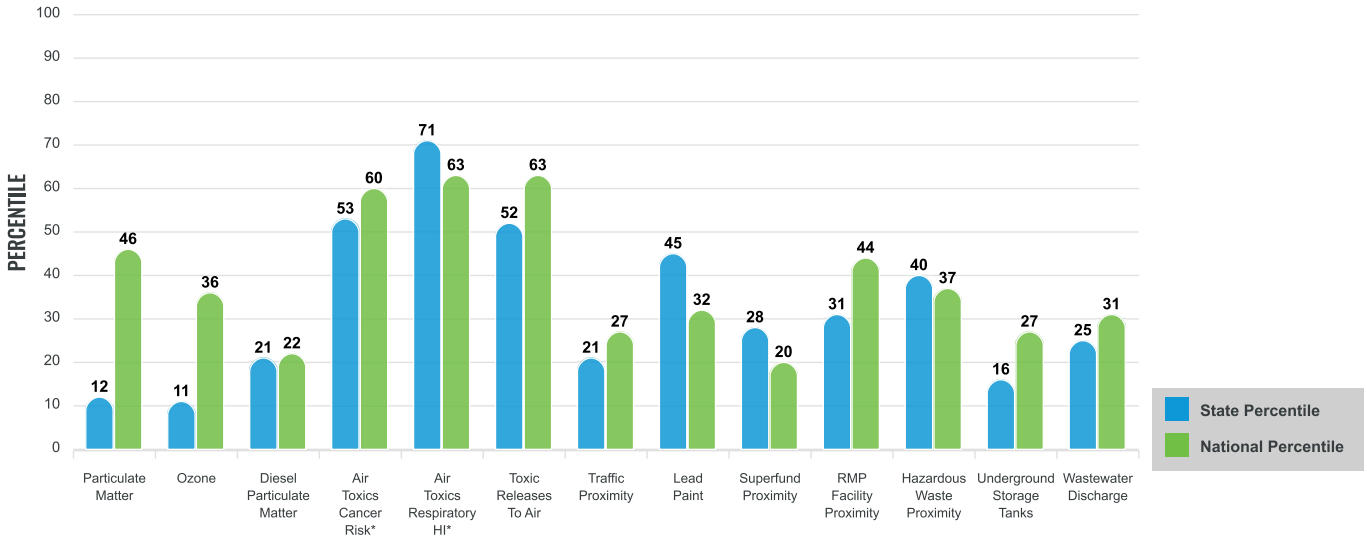
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450114021

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.66	9.11	20	8.08	63
Ozone (ppb)	61	64.6	19	61.6	49
Diesel Particulate Matter (µg/m^3)	0.143	0.218	30	0.261	29
Air Toxics Cancer Risk* (lifetime risk per million)	30	28	44	25	52
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	13,000	12,000	81	4,600	94
Traffic Proximity (daily traffic count/distance to road)	34	150	28	210	33
Lead Paint (% Pre-1960 Housing)	0.17	0.17	67	0.3	44
Superfund Proximity (site count/km distance)	0.03	0.085	40	0.13	28
RMP Facility Proximity (facility count/km distance)	0.21	0.63	40	0.43	58
Hazardous Waste Proximity (facility count/km distance)	0.38	0.75	55	1.9	46
Underground Storage Tanks (count/km^2)	0.13	2.3	20	3.9	29
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.00042	0.91	38	22	41
SOCIOECONOMIC INDICATORS					
Demographic Index	36%	46%	39	35%	60
Supplemental Demographic Index	8%	17%	18	14%	21
People of Color	56%	58%	47	39%	70
Low Income	17%	34%	28	31%	31
Unemployment Rate	0%	5%	0	6%	0
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	3%	16%	22	12%	26
Under Age 5	0%	6%	0	6%	0
Over Age 64	13%	14%	55	17%	41
Low Life Expectancy	19%	20%	37	20%	44

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 0
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 0
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment ..... Yes
Impaired Waters ..... Yes

Selected location contains American Indian Reservation Lands* ..... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community ..... No
Selected location contains an EPA IRA disadvantaged community ..... No

Report for Blockgroup: 482450114021

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	20%	37	20%	44
Heart Disease	6.5	5.9	62	6.1	60
Asthma	9.1	9.2	47	10	27
Cancer	6.7	5.2	81	6.1	62
Persons with Disabilities	14.3%	12.3%	67	13.4%	61

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	23%	10%	89	12%	87
Wildfire Risk	61%	30%	71	14%	87

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	10%	15%	47	14%	47
Lack of Health Insurance	11%	18%	29	9%	73
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450114021

CONFIDENTIAL BUSINESS INFORMATION

EPA

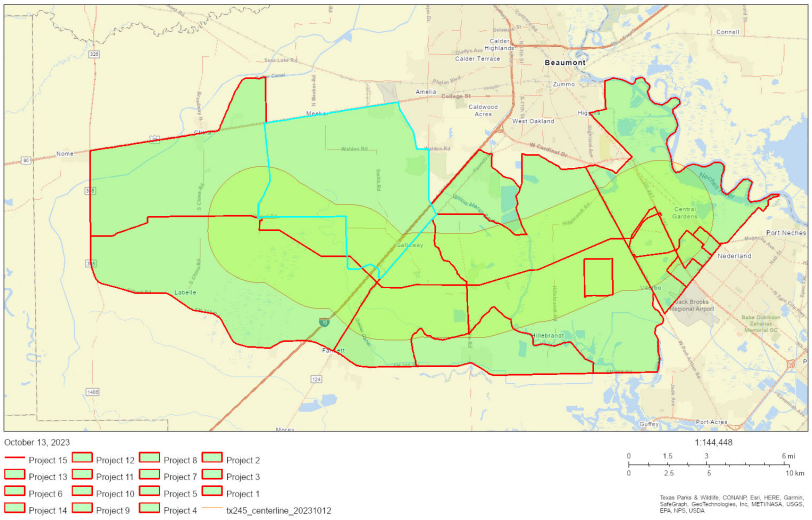
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

Blockgroup: 482450114022
Population: 1,523
Area in square miles: 29.51

A3 Landscape



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	73%
Spanish	24%
Other Indo-European	2%
Total Non-English	27%

COMMUNITY INFORMATION

- Low income: 15 percent
- People of color: 60 percent
- Less than high school education: 1 percent
- Limited English households: 5 percent
- Unemployment: 15 percent
- Persons with disabilities: 21 percent
- Male: 47 percent
- Female: 53 percent
- 79 years — Average life expectancy
- $39,656 — Per capita income
- Number of households: 504
- Owner occupied: 96 percent

BREAKDOWN BY RACE

- White: 40%
- Black: 45%
- American Indian: 1%
- Asian: 9%
- Hawaiian/Pacific Islander: 0%
- Other race: 0%
- Two or more races: 5%
- Hispanic: 0%

BREAKDOWN BY AGE

From Ages 1 to 4	7%
From Ages 1 to 18	20%
From Ages 18 and up	80%
From Ages 65 and up	14%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	100%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

CONFIDENTIAL BUSINESS INFORMATION

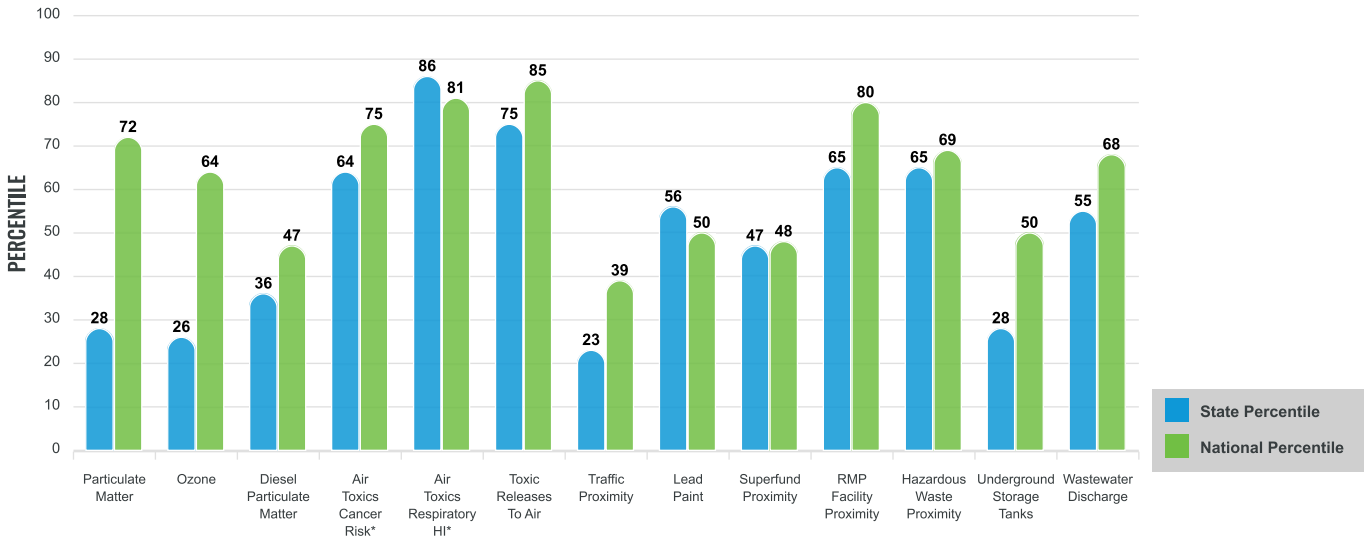
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EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

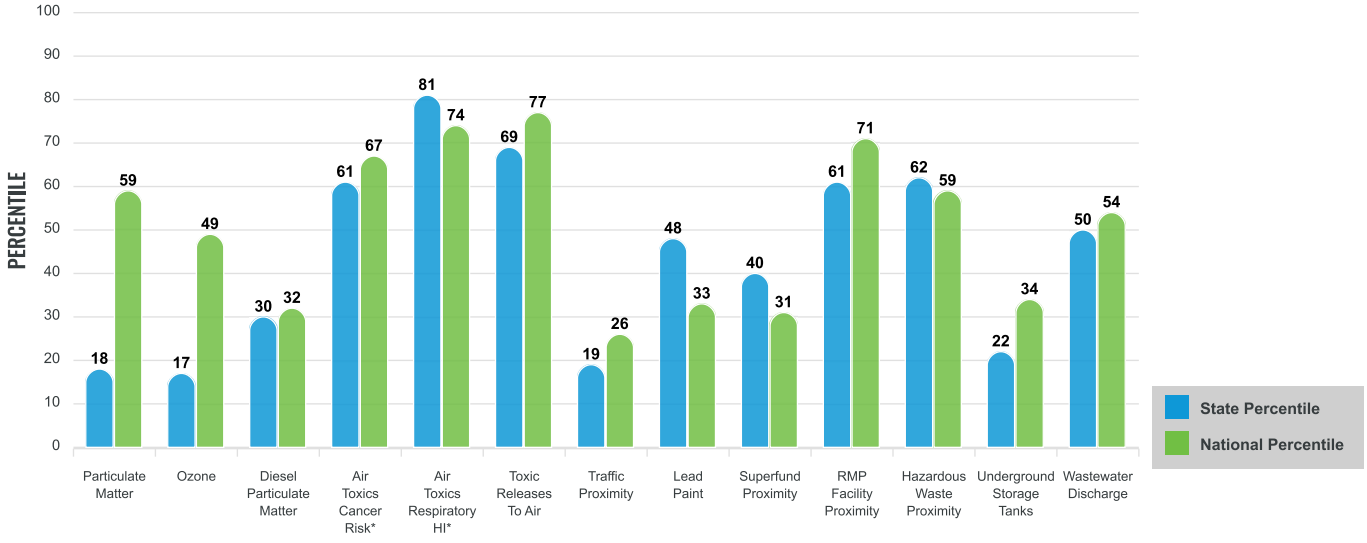
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450114022

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.66	9.11	20	8.08	63
Ozone (ppb)	61	64.6	19	61.6	49
Diesel Particulate Matter (µg/m^3)	0.143	0.218	30	0.261	29
Air Toxics Cancer Risk* (lifetime risk per million)	30	28	44	25	52
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	32,000	12,000	90	4,600	97
Traffic Proximity (daily traffic count/distance to road)	18	150	18	210	23
Lead Paint (% Pre-1960 Housing)	0.084	0.17	55	0.3	32
Superfund Proximity (site count/km distance)	0.031	0.085	41	0.13	29
RMP Facility Proximity (facility count/km distance)	0.99	0.63	81	0.43	88
Hazardous Waste Proximity (facility count/km distance)	1.1	0.75	79	1.9	63
Underground Storage Tanks (count/km^2)	0.14	2.3	20	3.9	30
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.0024	0.91	56	22	56
SOCIOECONOMIC INDICATORS					
Demographic Index	38%	46%	41	35%	61
Supplemental Demographic Index	11%	17%	32	14%	40
People of Color	60%	58%	51	39%	72
Low Income	15%	34%	24	31%	27
Unemployment Rate	15%	5%	91	6%	90
Limited English Speaking Households	5%	8%	60	5%	75
Less Than High School Education	1%	16%	12	12%	12
Under Age 5	7%	6%	64	6%	72
Over Age 64	14%	14%	57	17%	44
Low Life Expectancy	19%	20%	37	20%	44

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	0
Hazardous Waste, Treatment, Storage, and Disposal Facilities	4
Water Dischargers	28
Air Pollution	4
Brownfields	0
Toxic Release Inventory	8

Other community features within defined area:

Schools	0
Hospitals	0
Places of Worship	0

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	No

Report for Blockgroup: 482450114022

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	20%	37	20%	44
Heart Disease	6.5	5.9	62	6.1	60
Asthma	9.1	9.2	47	10	27
Cancer	6.7	5.2	81	6.1	62
Persons with Disabilities	14.3%	12.3%	67	13.4%	61

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	14%	10%	82	12%	77
Wildfire Risk	52%	30%	69	14%	86

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	17%	15%	64	14%	68
Lack of Health Insurance	11%	18%	29	9%	73
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	Yes	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482450114022

CONFIDENTIAL BUSINESS INFORMATION

EPA

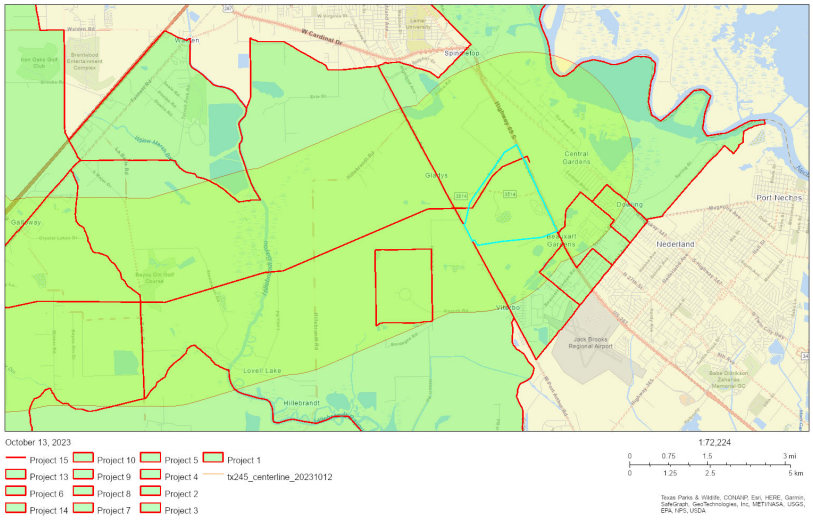
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

Blockgroup: 482459802001
Population: 6,510
Area in square miles: 2.02

A3 Landscape



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	74%
Spanish	24%
Total Non-English	26%

COMMUNITY INFORMATION

Low income: 100 percent

People of color: 71 percent

Less than high school education: 24 percent

Limited English households: N/A percent

Unemployment: 0 percent

Persons with disabilities: 0 percent

Male: 99 percent

Female: 1 percent

N/A
Average life expectancy

$3,091
Per capita income

Number of households: 0

Owner occupied: 0 percent

BREAKDOWN BY RACE

White: 29%

Black: 42%

American Indian: 1%

Asian: 0%

Hawaiian/Pacific Islander: 0%

Other race: 0%

Two or more races: 0%

Hispanic: 27%

BREAKDOWN BY AGE

From Ages 1 to 4	0%
From Ages 1 to 18	2%
From Ages 18 and up	98%
From Ages 65 and up	3%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

CONFIDENTIAL BUSINESS INFORMATION

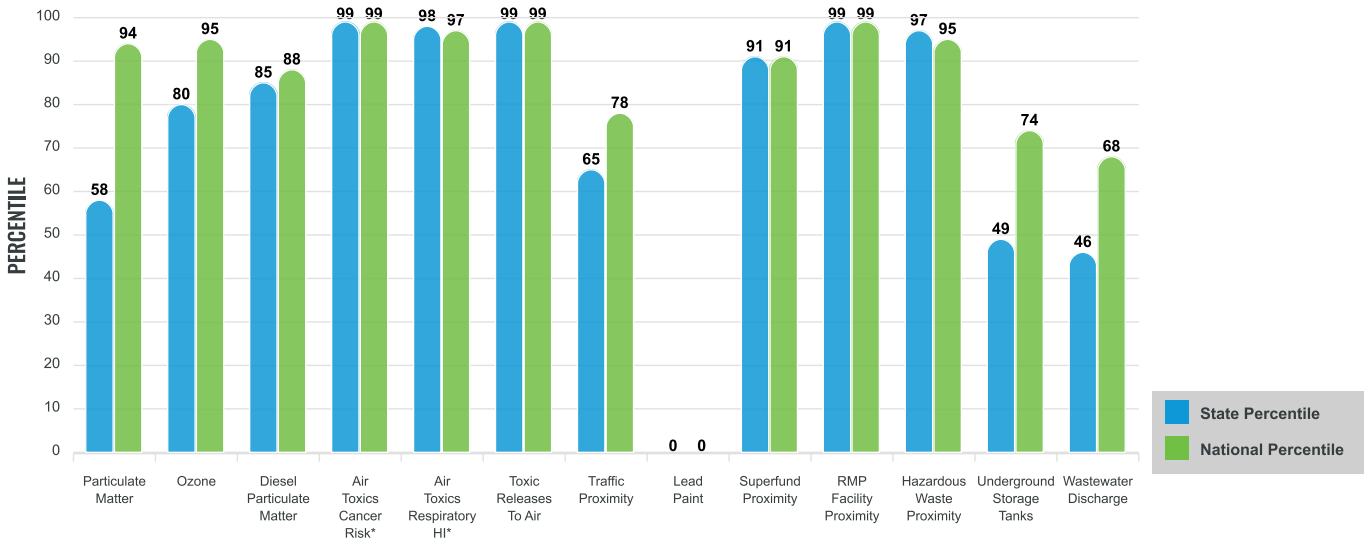
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EJ INDEXES

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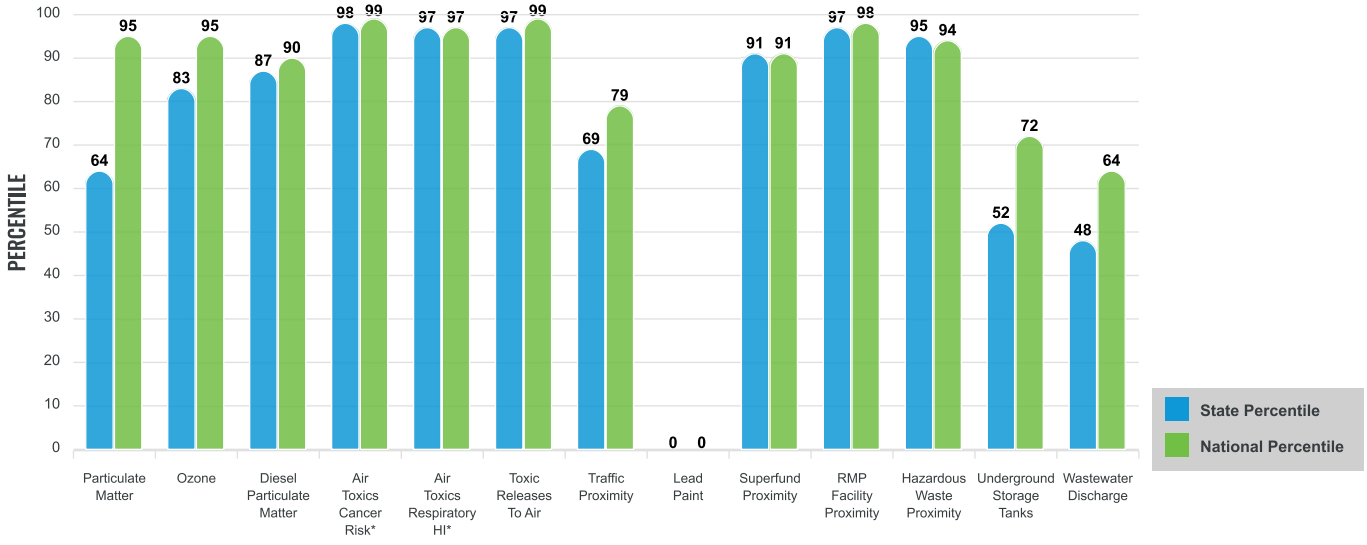
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482459802001

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.83	9.11	26	8.08	69
Ozone (ppb)	63.8	64.6	45	61.6	68
Diesel Particulate Matter (µg/m^3)	0.237	0.218	57	0.261	55
Air Toxics Cancer Risk* (lifetime risk per million)	50	28	97	25	94
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	57,000	12,000	94	4,600	98
Traffic Proximity (daily traffic count/distance to road)	48	150	35	210	39
Lead Paint (% Pre-1960 Housing)	0	0.17	0	0.3	0
Superfund Proximity (site count/km distance)	0.078	0.085	70	0.13	58
RMP Facility Proximity (facility count/km distance)	2.9	0.63	97	0.43	98
Hazardous Waste Proximity (facility count/km distance)	1.6	0.75	86	1.9	70
Underground Storage Tanks (count/km^2)	0.2	2.3	22	3.9	32
Wastewater Discharge (toxicity-weighted concentration/m distance)	4.6E-05	0.91	19	22	25
SOCIOECONOMIC INDICATORS					
Demographic Index	86%	46%	96	35%	97
Supplemental Demographic Index	31%	17%	91	14%	95
People of Color	71%	58%	60	39%	78
Low Income	100%	34%	99	31%	99
Unemployment Rate	0%	5%	0	6%	0
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	24%	16%	73	12%	86
Under Age 5	0%	6%	0	6%	0
Over Age 64	3%	14%	8	17%	4
Low Life Expectancy	N/A	20%	N/A	20%	N/A

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 3
Air Pollution 0
Brownfields 0
Toxic Release Inventory 0

Other community features within defined area:

Schools 6
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment ..... Yes
Impaired Waters ..... No

Selected location contains American Indian Reservation Lands* ..... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community ..... No
Selected location contains an EPA IRA disadvantaged community ..... Yes

Report for Blockgroup: 482459802001

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	N/A	20%	N/A	20%	N/A
Heart Disease	1	5.9	0	6.1	0
Asthma	8.5	9.2	23	10	13
Cancer	0.5	5.2	0	6.1	0
Persons with Disabilities	20%	12.3%	89	13.4%	86

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	0%	10%	0	12%	0
Wildfire Risk	0%	30%	0	14%	0

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	0%	15%	0	14%	0
Lack of Health Insurance	70%	18%	99	9%	99
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482459802001

CONFIDENTIAL BUSINESS INFORMATION

EPA

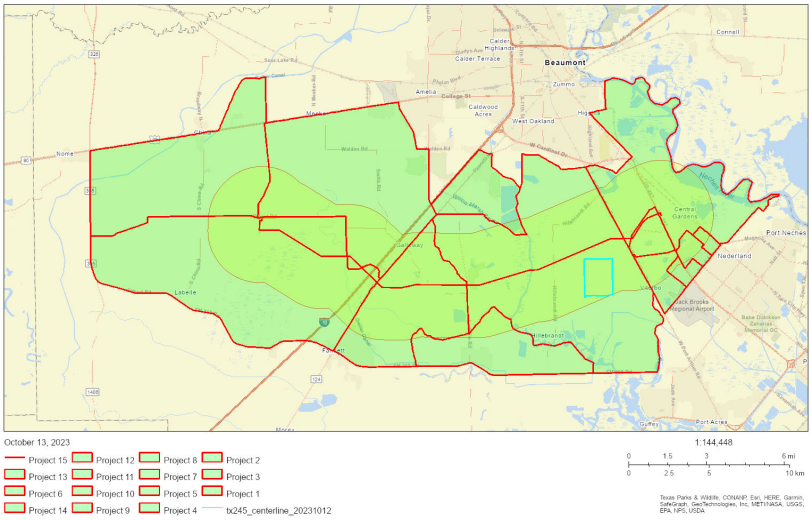
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

Blockgroup: 482459803001
Population: 3,030
Area in square miles: 1.53

A3 Landscape



COMMUNITY INFORMATION

Low income: 0 percent	People of color: 72 percent	Less than high school education: 22 percent	Limited English households: N/A percent
Unemployment: 0 percent	Persons with disabilities: 0 percent	Male: 100 percent	Female: 0 percent
N/A Average life expectancy	$2,233 Per capita income	Number of households: 0	Owner occupied: 0 percent

BREAKDOWN BY RACE

White: 28%	Black: 39%	American Indian: 3%	Asian: 1%
Hawaiian/Pacific Islander: 0%	Other race: 0%	Two or more races: 0%	Hispanic: 30%

BREAKDOWN BY AGE

From Ages 1 to 4	0%
From Ages 1 to 18	3%
From Ages 18 and up	97%
From Ages 65 and up	3%

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	69%
Spanish	26%
Korean	1%
Other Asian and Pacific Island	2%
Other and Unspecified	2%
Total Non-English	31%

LIMITED ENGLISH SPEAKING BREAKDOWN

Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

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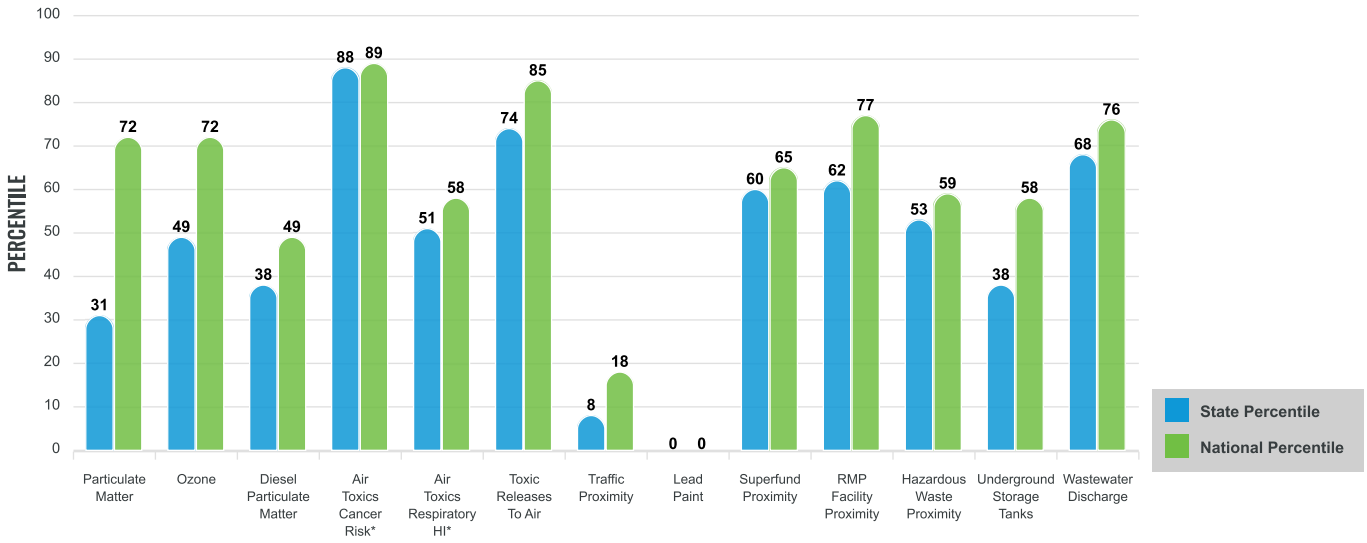
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

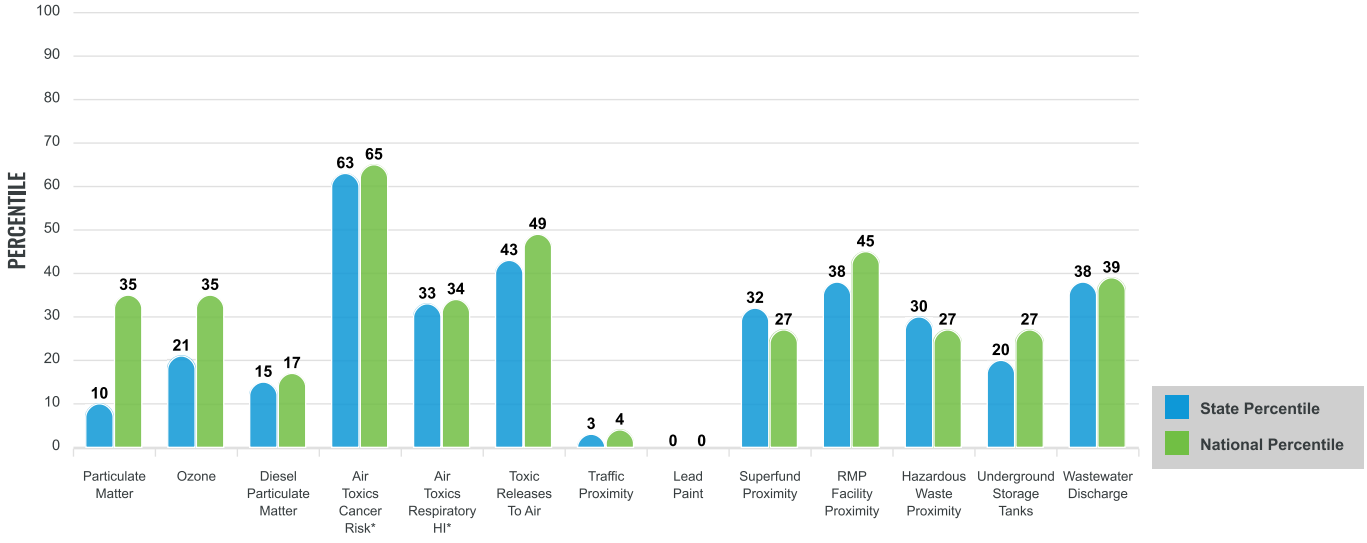
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482459803001

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.79	9.11	24	8.08	67
Ozone (ppb)	63.7	64.6	45	61.6	68
Diesel Particulate Matter (µg/m^3)	0.154	0.218	33	0.261	32
Air Toxics Cancer Risk* (lifetime risk per million)	50	28	97	25	94
Air Toxics Respiratory HI*	0.3	0.3	29	0.31	31
Toxic Releases to Air	38,000	12,000	91	4,600	98
Traffic Proximity (daily traffic count/distance to road)	2.8	150	5	210	8
Lead Paint (% Pre-1960 Housing)	0	0.17	0	0.3	0
Superfund Proximity (site count/km distance)	0.064	0.085	64	0.13	52
RMP Facility Proximity (facility count/km distance)	0.82	0.63	76	0.43	85
Hazardous Waste Proximity (facility count/km distance)	0.42	0.75	57	1.9	47
Underground Storage Tanks (count/km^2)	0.72	2.3	35	3.9	43
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.036	0.91	83	22	76
SOCIOECONOMIC INDICATORS					
Demographic Index	36%	46%	38	35%	60
Supplemental Demographic Index	5%	17%	7	14%	8
People of Color	72%	58%	62	39%	79
Low Income	0%	34%	0	31%	0
Unemployment Rate	0%	5%	0	6%	0
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	22%	16%	70	12%	83
Under Age 5	0%	6%	0	6%	0
Over Age 64	3%	14%	10	17%	5
Low Life Expectancy	N/A	20%	N/A	20%	N/A

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0
Water Dischargers 0
Air Pollution 1
Brownfields 0
Toxic Release Inventory 1

Other community features within defined area:

Schools 0
Hospitals 0
Places of Worship 0

Other environmental data:

Air Non-attainment ..... Yes
Impaired Waters ..... No

Selected location contains American Indian Reservation Lands* ..... No
Selected location contains a "Justice40 (CEJST)" disadvantaged community ..... No
Selected location contains an EPA IRA disadvantaged community ..... No

Report for Blockgroup: 482459803001

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	N/A	20%	N/A	20%	N/A
Heart Disease	3.9	5.9	18	6.1	10
Asthma	7	9.2	0	10	0
Cancer	2.4	5.2	2	6.1	1
Persons with Disabilities	0%	12.3%	0	13.4%	0

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	0%	10%	0	12%	0
Wildfire Risk	0%	30%	0	14%	0

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	0%	15%	0	14%	0
Lack of Health Insurance	0%	18%	0	9%	0
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Footnotes

Report for Blockgroup: 482459803001

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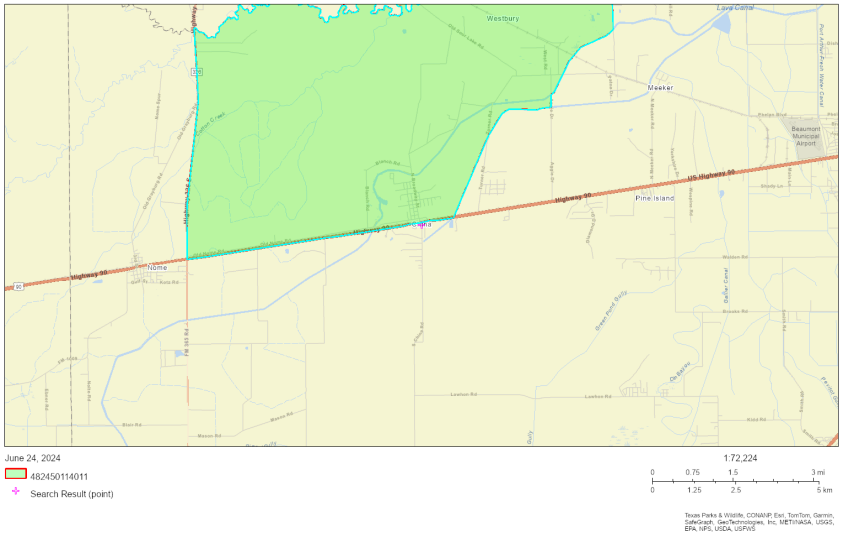
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

Blockgroup: 482450114011
Population: 1,676
Area in square miles: 31.52

A3 Landscape



COMMUNITY INFORMATION

- Low income: 14 percent
- People of color: 4 percent
- Less than high school education: 7 percent
- Limited English households: 0 percent
- Unemployment: 11 percent
- Persons with disabilities: 18 percent
- Male: 55 percent
- Female: 45 percent
- 79 years — Average life expectancy
- $42,044 — Per capita income
- Number of households: 635
- Owner occupied: 92 percent

BREAKDOWN BY RACE

- White: 96%
- Black: 0%
- American Indian: 0%
- Asian: 0%
- Hawaiian/Pacific Islander: 0%
- Other race: 0%
- Two or more races: 2%
- Hispanic: 3%

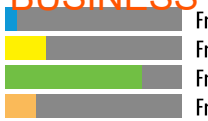
BREAKDOWN BY AGE

LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	94%
Spanish	4%
French, Haitian, or Cajun	1%
Vietnamese	1%

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Total Non-English	6%



From Ages 1 to 4	6%
From Ages 1 to 18	23%
From Ages 18 and up	77%
From Ages 65 and up	17%

LIMITED ENGLISH SPEAKING BREAKDOWN



Speak Spanish	0%
Speak Other Indo-European Languages	0%
Speak Asian-Pacific Island Languages	0%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

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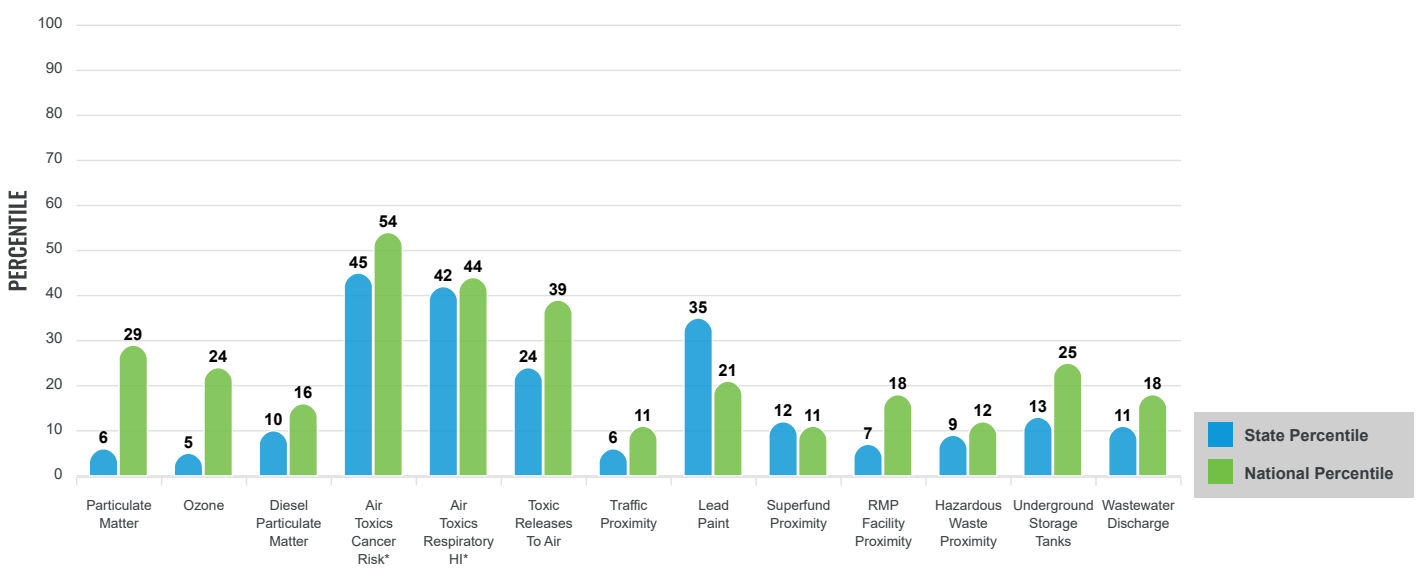
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

EJ INDEXES FOR THE SELECTED LOCATION

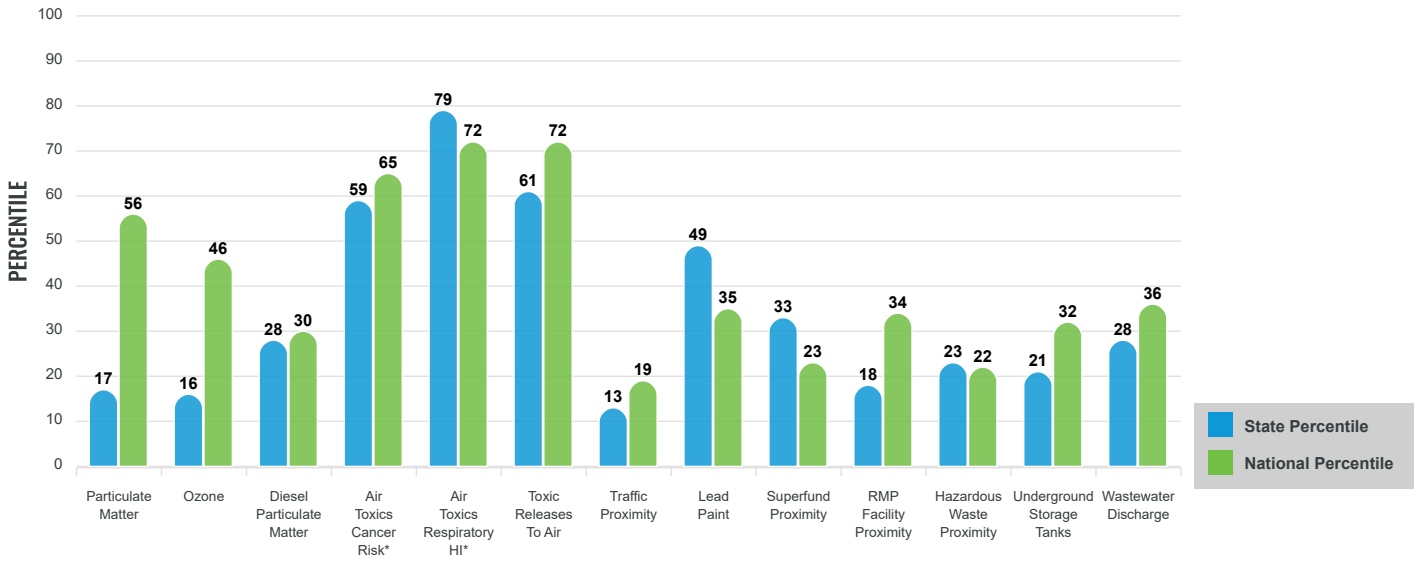


SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

CONFIDENTIAL BUSINESS INFORMATION

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for Blockgroup: 482450114011

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.66	9.11	20	8.08	63
Ozone (ppb)	61	64.6	19	61.6	49
Diesel Particulate Matter (µg/m^3)	0.143	0.218	30	0.261	29
Air Toxics Cancer Risk* (lifetime risk per million)	30	28	44	25	52
Air Toxics Respiratory HI*	0.4	0.3	80	0.31	70
Toxic Releases to Air	12,000	12,000	80	4,600	93
Traffic Proximity (daily traffic count/distance to road)	12	150	13	210	18
Lead Paint (% Pre-1960 Housing)	0.12	0.17	61	0.3	37
Superfund Proximity (site count/km distance)	0.026	0.085	36	0.13	24
RMP Facility Proximity (facility count/km distance)	0.11	0.63	17	0.43	33
Hazardous Waste Proximity (facility count/km distance)	0.11	0.75	23	1.9	21
Underground Storage Tanks (count/km^2)	0.14	2.3	20	3.9	30
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.00024	0.91	32	22	37
SOCIOECONOMIC INDICATORS					
Demographic Index	9%	46%	3	35%	8
Supplemental Demographic Index	10%	17%	29	14%	35
People of Color	4%	58%	2	39%	11
Low Income	14%	34%	23	31%	25
Unemployment Rate	11%	5%	85	6%	84
Limited English Speaking Households	0%	8%	0	5%	0
Less Than High School Education	7%	16%	35	12%	44
Under Age 5	6%	6%	51	6%	59
Over Age 64	17%	14%	68	17%	56
Low Life Expectancy	19%	20%	37	20%	44

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund 0
Hazardous Waste, Treatment, Storage, and Disposal Facilities 0

Other community features within defined area:

Schools 1
Hospitals 0

CONFIDENTIAL BUSINESS INFORMATION

Water Dischargers	4
Air Pollution	1
Brownfields	0
Toxic Release Inventory	1

Places of Worship	0

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	No
Selected location contains an EPA IRA disadvantaged community	No

Report for Blockgroup: 482450114011

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	19%	20%	37	20%	44
Heart Disease	6.5	5.9	62	6.1	60
Asthma	9.1	9.2	47	10	27
Cancer	6.7	5.2	81	6.1	62
Persons with Disabilities	17.8%	12.3%	82	13.4%	78

CLIMATE INDICATORS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	19%	10%	87	12%	84
Wildfire Risk	44%	30%	67	14%	85

CRITICAL SERVICE GAPS

INDICATOR	VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	6%	15%	34	14%	31
Lack of Health Insurance	12%	18%	33	9%	76
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	No	N/A	N/A	N/A	N/A

Report for Blockgroup: 482450114011

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www.epa.gov/ejscreen

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EPA

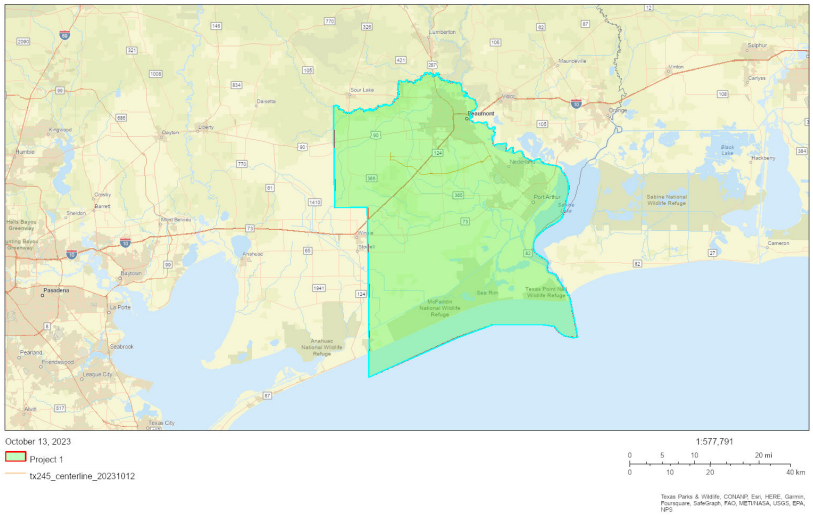
EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Jefferson County, TX

County: Jefferson
Population: 256,755
Area in square miles: 1112.65

A3 Landscape



LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	78%
Spanish	18%
Other Indo-European	1%
Vietnamese	2%
Total Non-English	22%

COMMUNITY INFORMATION


Low income: 38 percent


People of color: 61 percent


Less than high school education: 15 percent


Limited English households: 5 percent


Unemployment: 6 percent


Persons with disabilities: 15 percent


Male: 51 percent


Female: 49 percent

79 years
Average life expectancy

$28,529
Per capita income


Number of households: 92,751


Owner occupied: 62 percent

BREAKDOWN BY RACE


White: 39%


Black: 33%


American Indian: 0%


Asian: 4%


Hawaiian/Pacific Islander: 0%


Other race: 0%


Two or more races: 2%


Hispanic: 22%

BREAKDOWN BY AGE



From Ages 1 to 4	7%
From Ages 1 to 18	24%
From Ages 18 and up	76%
From Ages 65 and up	14%

LIMITED ENGLISH SPEAKING BREAKDOWN



Speak Spanish	80%
Speak Other Indo-European Languages	10%
Speak Asian-Pacific Island Languages	10%
Speak Other Languages	0%

Notes: Numbers may not sum to totals due to rounding. Hispanic population can be of any race.
Source: U.S. Census Bureau, American Community Survey (ACS) 2017 -2021. Life expectancy data comes from the Centers for Disease Control.

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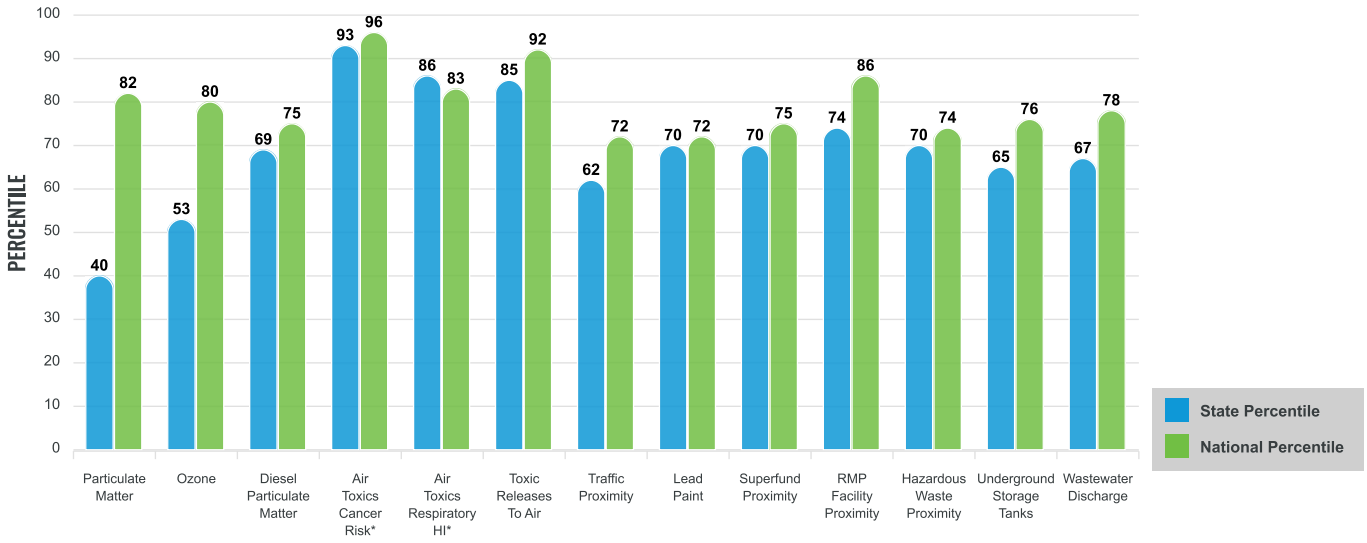
Environmental Justice & Supplemental Indexes

The environmental justice and supplemental indexes are a combination of environmental and socioeconomic information. There are thirteen EJ indexes and supplemental indexes in EJScreen reflecting the 13 environmental indicators. The indexes for a selected area are compared to those for all other locations in the state or nation. For more information and calculation details on the EJ and supplemental indexes, please visit the EJScreen website.

EJ INDEXES

The EJ indexes help users screen for potential EJ concerns. To do this, the EJ index combines data on low income and people of color populations with a single environmental indicator.

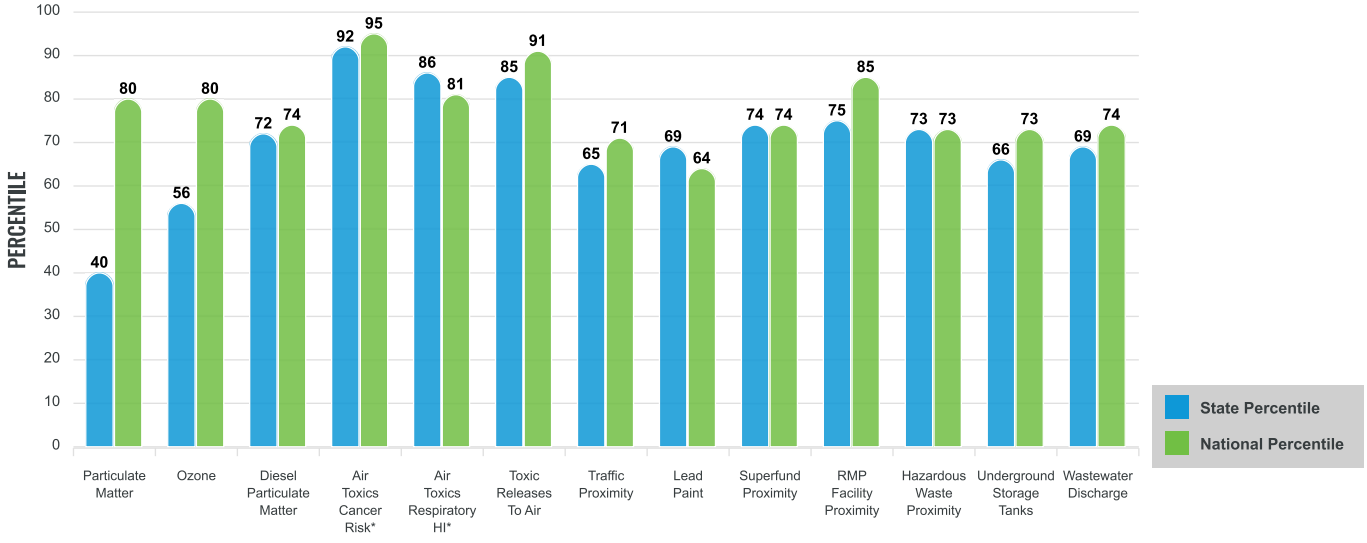
EJ INDEXES FOR THE SELECTED LOCATION



SUPPLEMENTAL INDEXES

The supplemental indexes offer a different perspective on community-level vulnerability. They combine data on percent low-income, percent linguistically isolated, percent less than high school education, percent unemployed, and low life expectancy with a single environmental indicator.

SUPPLEMENTAL INDEXES FOR THE SELECTED LOCATION



These percentiles provide perspective on how the selected block group or buffer area compares to the entire state or nation.

Report for County: Jefferson

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

SELECTED VARIABLES	VALUE	STATE AVERAGE	PERCENTILE IN STATE	USA AVERAGE	PERCENTILE IN USA
POLLUTION AND SOURCES					
Particulate Matter (µg/m^3)	8.78	9.11	24	8.08	67
Ozone (ppb)	63.1	64.6	39	61.6	64
Diesel Particulate Matter (µg/m^3)	0.255	0.218	63	0.261	59
Air Toxics Cancer Risk* (lifetime risk per million)	58	28	97	25	94
Air Toxics Respiratory HI*	0.37	0.3	29	0.31	31
Toxic Releases to Air	130,000	12,000	98	4,600	99
Traffic Proximity (daily traffic count/distance to road)	110	150	61	210	60
Lead Paint (% Pre-1960 Housing)	0.22	0.17	72	0.3	50
Superfund Proximity (site count/km distance)	0.096	0.085	76	0.13	65
RMP Facility Proximity (facility count/km distance)	1.8	0.63	91	0.43	95
Hazardous Waste Proximity (facility count/km distance)	0.98	0.75	76	1.9	61
Underground Storage Tanks (count/km^2)	2.8	2.3	67	3.9	65
Wastewater Discharge (toxicity-weighted concentration/m distance)	0.39	0.91	95	22	88
SOCIOECONOMIC INDICATORS					
Demographic Index	50%	46%	57	35%	74
Supplemental Demographic Index	17%	17%	60	14%	71
People of Color	61%	58%	52	39%	73
Low Income	38%	34%	59	31%	67
Unemployment Rate	6%	5%	63	6%	62
Limited English Speaking Households	5%	8%	59	5%	75
Less Than High School Education	15%	16%	58	12%	72
Under Age 5	7%	6%	60	6%	67
Over Age 64	14%	14%	58	17%	45
Low Life Expectancy	21%	20%	61	20%	64

*Diesel particulate matter, air toxics cancer risk, and air toxics respiratory hazard index are from the EPA's Air Toxics Data Update, which is the Agency's ongoing, comprehensive evaluation of air toxics in the United States. This effort aims to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that the air toxics data presented here provide broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. Cancer risks and hazard indices from the Air Toxics Data Update are reported to one significant figure and any additional significant figures here are due to rounding. More information on the Air Toxics Data Update can be found at: https://www.epa.gov/haps/air-toxics-data-update.

Sites reporting to EPA within defined area:

Superfund	1
Hazardous Waste, Treatment, Storage, and Disposal Facilities	31
Water Dischargers	695
Air Pollution	122
Brownfields	35
Toxic Release Inventory	113

Other community features within defined area:

Schools	89
Hospitals	16
Places of Worship	236

Other environmental data:

Air Non-attainment	Yes
Impaired Waters	Yes

Selected location contains American Indian Reservation Lands*	No
Selected location contains a "Justice40 (CEJST)" disadvantaged community	Yes
Selected location contains an EPA IRA disadvantaged community	Yes

Report for County: Jefferson

CONFIDENTIAL BUSINESS INFORMATION

EJScreen Environmental and Socioeconomic Indicators Data

HEALTH INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Low Life Expectancy	21%	20%	61	20%	64
Heart Disease	6.7	5.9	65	6.1	64
Asthma	10	9.2	78	10	52
Cancer	5.7	5.2	62	6.1	37
Persons with Disabilities	15.1%	12.3%	71	13.4%	66

CLIMATE INDICATORS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Flood Risk	18%	10%	87	12%	83
Wildfire Risk	55%	30%	70	14%	86

CRITICAL SERVICE GAPS

INDICATOR	HEALTH VALUE	STATE AVERAGE	STATE PERCENTILE	US AVERAGE	US PERCENTILE
Broadband Internet	16%	15%	62	14%	65
Lack of Health Insurance	21%	18%	65	9%	93
Housing Burden	No	N/A	N/A	N/A	N/A
Transportation Access	Yes	N/A	N/A	N/A	N/A
Food Desert	Yes	N/A	N/A	N/A	N/A

Footnotes

Report for County: Jefferson

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CONFIDENTIAL BUSINESS INFORMATION

Appendix K.2 Demographic and Environmental Indicators for Jefferson County

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The environmental justice (EJ) assessment report uses the EJScreen Tool (EPA EJScreen Tool Version 2.2, accessed October 2023) to consider a wide array of demographic and environmental indicators for Jefferson County and the Census Block Groups (CBGs) in the EJ Study Area. The full EJScreen reports (accessed in October 2023 and June 2024) for all the CBGs are provided in Appendix K.1 ─ Demographic and Environmental Indicators for Jefferson County.

1.0 Demographic Indicators

Table 1 presents percentile rankings statewide and nationally for each of the demographic indicators for each CBG in the EJ Study Area. Rankings in the 80th percentile and above are shown in bold and the cell is shaded dark gray. CBGs CT 13.03 BG 2 and CT 113.04 BG 3 are ranked above the 80th percentile nationally for people of color. CBG CT 113.04 BG 3 is above the 80th percentile nationally for low-income households and CT 9802 BG 1 is above the 80th percentile nationally and statewide for low-income households.

The other CBG demographic indicators at or above the 80th percentile either nationally or statewide are as follows:

- Unemployment Rate—CT 13.03 BG 2, CT 114.01 BG 1, and CT 114.02 BG 2 (statewide and nationally);
- Limited English Speaking—CT 113.04 BG 1 (statewide and nationally);
- Less than High School Education—CT 113.04 BG 3, CT 9802 BG 1, and CT 9803 BG 1 (nationally);
- Population under Age 5—CT 112.04 BG 2 (statewide and nationally); and
- Population Over Age 64—CT 13.03 BG 2, CT 112.04 BG 2, and CT 114.01 BG 3 (statewide).

Graphical data for the national percentile rankings for people of color and low-income are provided on Figures 1 and 2, respectively. Data for the national percentile rankings for the other demographic indicators with at least one EJ Study Area CBG at or above the 80th percentile nationally are provided in Figures 3 through 5. Data for the state percentile rankings for the other demographic indicators with at least one EJ Study Area CBG at or above the 80th percentile statewide (but not nationally) are provided in Figures 6 and 7.

Table 1: EJScreen Demographic Indicator National and Statewide Percentile Rankings for Jefferson County and the Census Block Groups in the EJ Study Area

Demographic Indicator	Jefferson County	CT 13.03 BG 2	CT 112.04 BG 1	CT 112.04 BG 2	CT 112.04 BG 3	CT 112.05 BG 1	CT 112.05 BG 2	CT 113.04 BG 1	CT 113.04 BG 2	CT 113.04 BG 3	CT 114.01 BG 1	CT 114.01 BG 3	CT 114.02 BG 1	CT 114.02 BG 2	CT 9802 BG 1	CT 9803 BG 1
Demographic Index	57th / 74th	61st / 77th	11th / 26th	14th / 30th	10th / 24th	9th / 21st	5th / 14th	37th / 58th	3rd / 9th	72nd / **85th**	21st / 9th	31st / 52nd	39th / 60th	41st / 61st	**96th / 97th**	38th / 60th
Supplemental Demographic Index	60th / 71st	58th / 69th	21st / 25th	34th / 42nd	26th / 32nd	20th / 36th	11th / 13th	52nd / 62nd	19th / 22nd	66th / 77th	43rd / 36th	30th / 37th	18th / 21st	32nd / 40th	**91st / 95th**	7th / 8th
People of Color	52nd / 73rd	69th / **83rd**	20th / 46th	4th / 20th	9th / 31st	3rd / 16th	11th / 35th	37th / 63rd	2nd / 10th	65th / **81st**	17th / 3rd	32nd / 58th	47th / 70th	51st / 72nd	60th / 78th	62nd / 79th
Low-Income	59th / 67th	42nd / 49th	13th / 13th	48th / 55th	29th / 33rd	38th / 44th	10th / 10th	40th / 46th	25th / 28th	74th / **81st**	40th / 35th	35th / 41st	28th / 31st	24th / 27th	**99th / 99th**	0/0
Unemployment Rate	63rd / 62nd	**99th / 99th**	44th / 41st	0/0	57th / 55th	49th / 46th	70th / 69th	39th / 36th	33rd / 29th	0/0	**84th / 84th**	30th / 26th	0/0	**91st / 90th**	0/0	0/0
Limited English Speaking	59th / 75th	0/0	54th / 70th	0/0	0/0	0/0	0/0	**86th** / 92nd	0/0	0/0	0/0	0/0	0/0	60th / 75th	0/0	0/0
Population with Less than High School Education	58th / 72nd	19th / 22nd	42nd / 54th	37th / 46th	34th / 42nd	29th / 35th	0/0	41st / 52nd	12th / 12th	75th / **88th**	54th / 43rd	47th / 60th	22nd / 26th	12th / 12th	73rd / **86th**	70th / **83rd**
Population Under Age 5	60th / 67th	30th / 35th	0/0	**89th / 93rd**	55th / 63rd	0/0	0/0	51st / 59th	59th / 66th	0/0	23rd / 21st	0/0	0/0	64th / 72nd	0/0	0/0
Population Over Age 64	58th / 45th	**84th /** 77th	24th / 15th	**80th** / 71st	70th / 59th	42nd / 60th	22nd / 13th	59th / 45th	25th / 15th	12th / 7th	66th / 76th	**82nd /** 74th	55th / 41st	57th / 44th	8th / 4th	10th / 5th
Low Life Expectancy	61st / 64th	66th / 68th	44th / 50th	44th / 50th	44th / 50th	44th / 50th	44th/ 50th	76th / 76th	76th / 76th	76th / 76th	37th / 44th	37th / 44th	37th / 44th	37th / 44th	N/A	N/A

Data Source: EPA, 2023 and CT 114.01 BG 1 added June 2024

Figure 1: People of Color in the EJ Study Area—Socioeconomic Indicator National Percentile Rankings

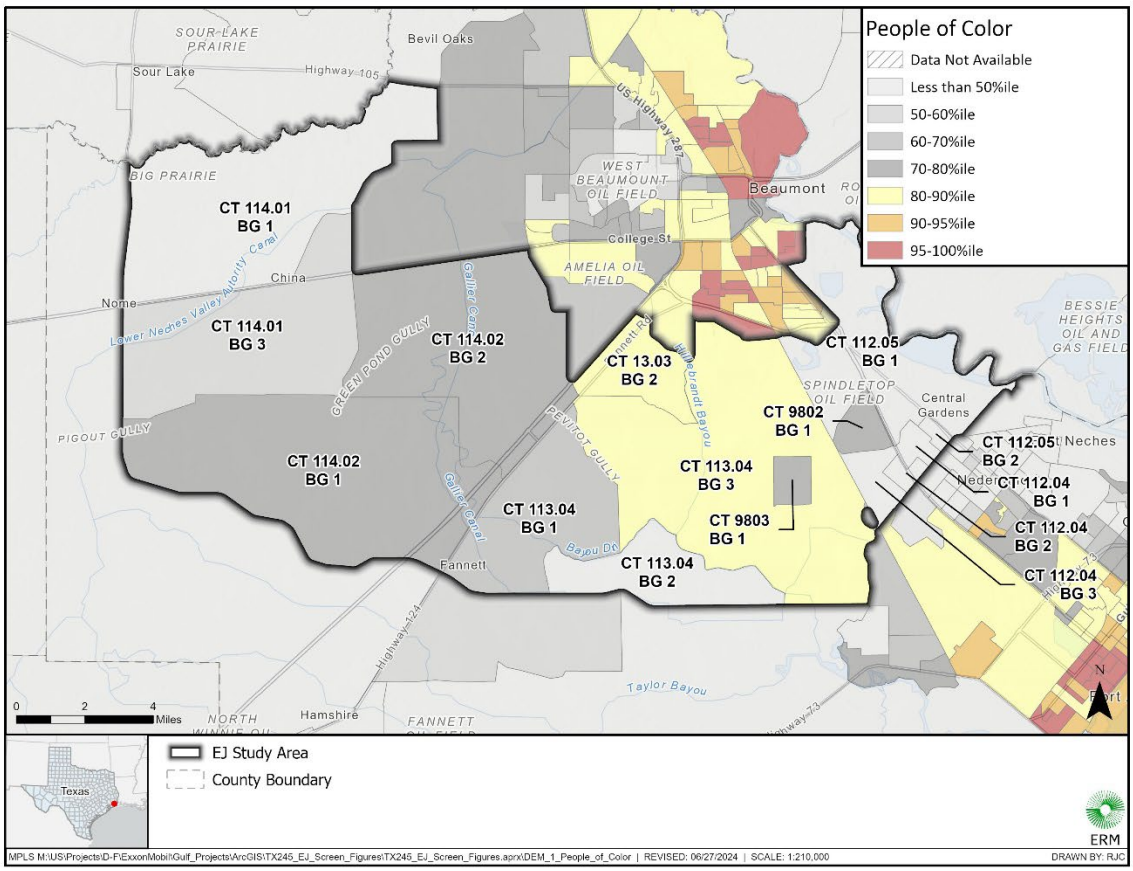


Figure 2: Low-Income Rate in the EJ Study Area—National Percentile Rankings

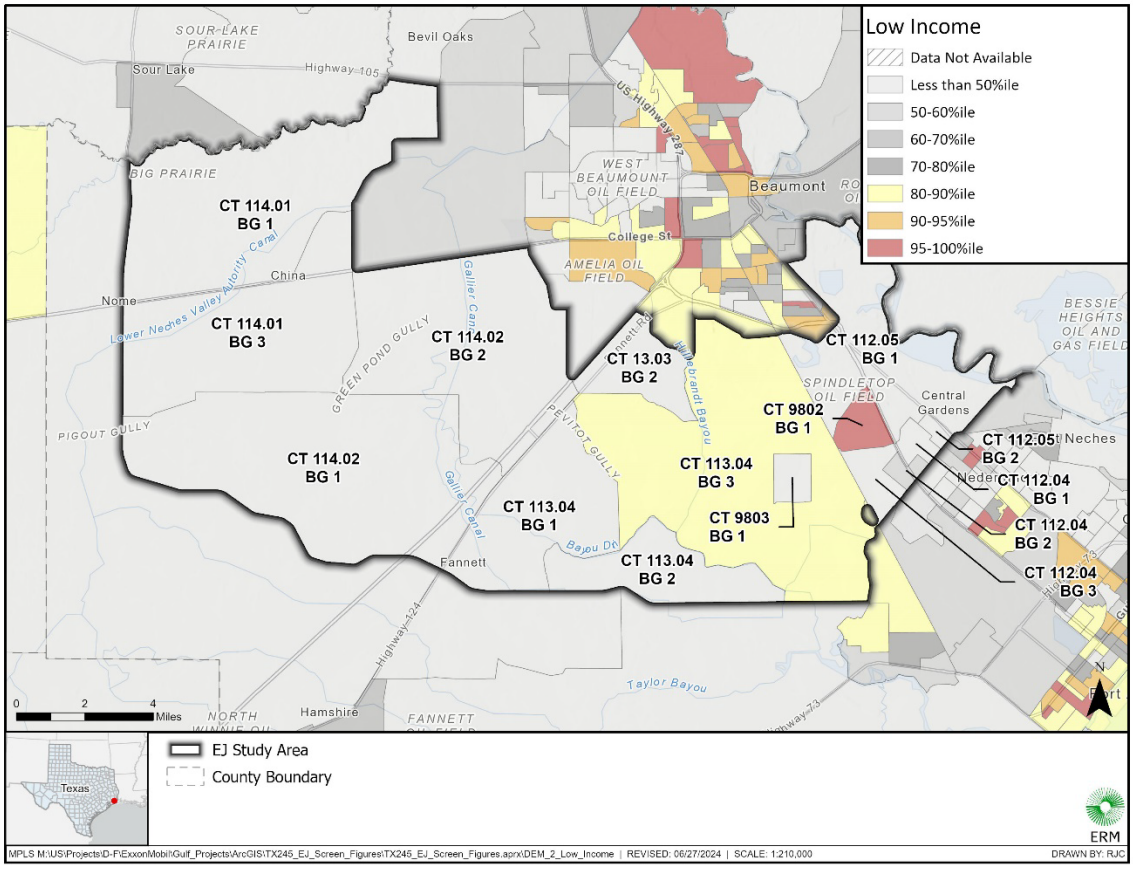


Figure 2: Unemployment Rate in the EJ Study Area—National Percentile Rankings

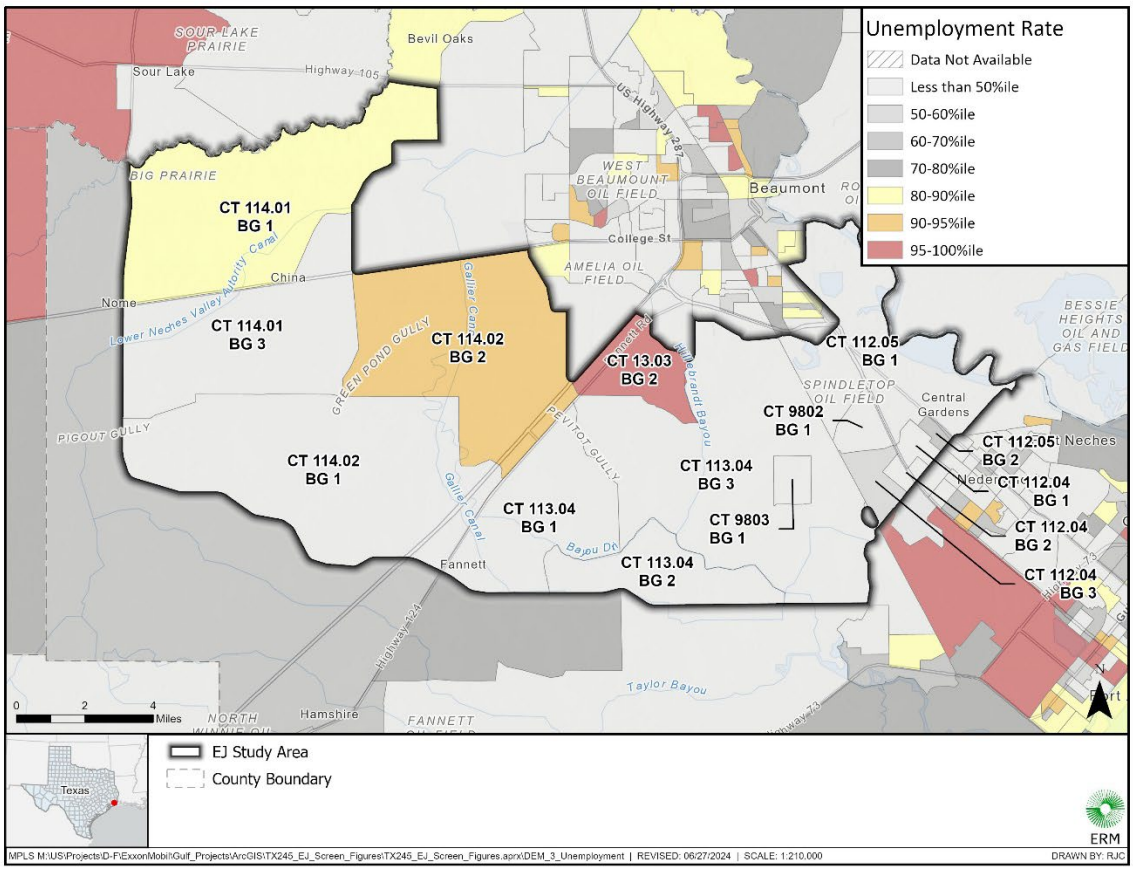


Figure 3: Limited English-Speaking Rate in the EJ Study Area—National Percentile Rankings

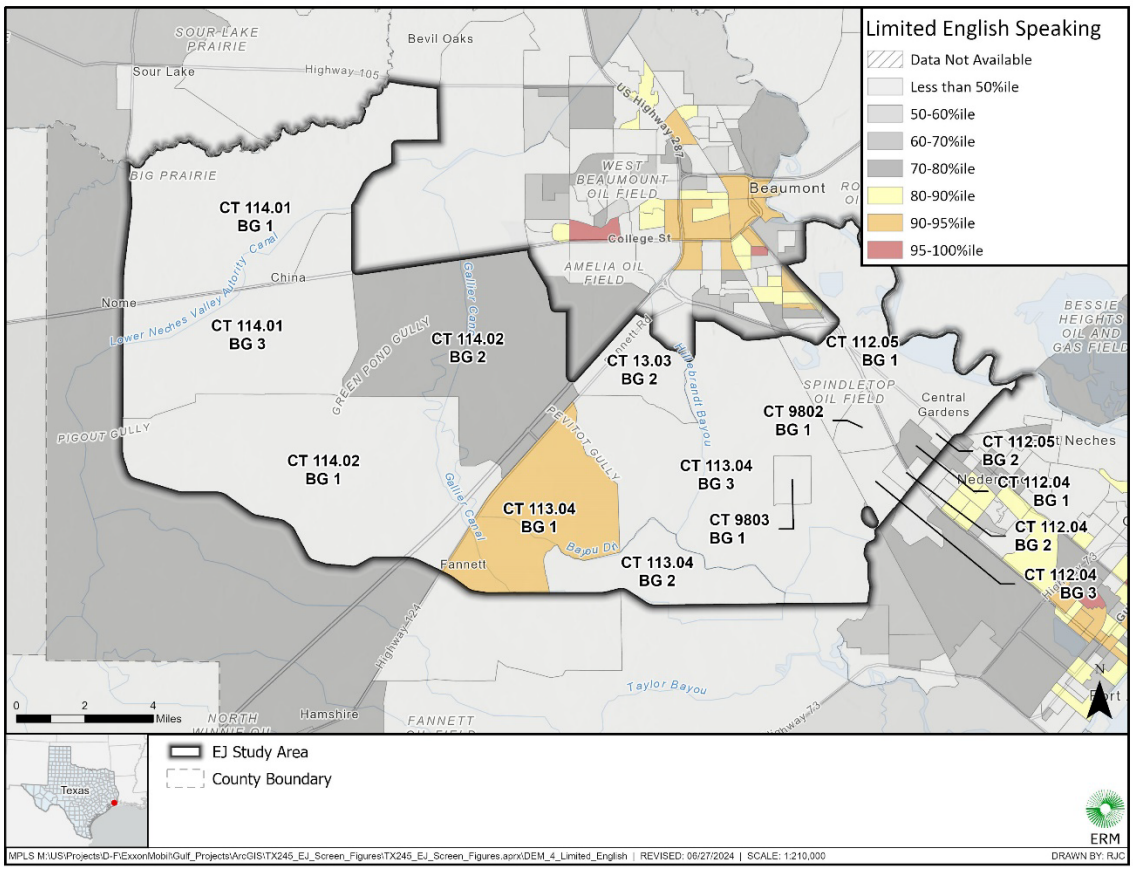


Figure 4: Population with Less than High School Education in the EJ Study Area—National Percentile Rankings

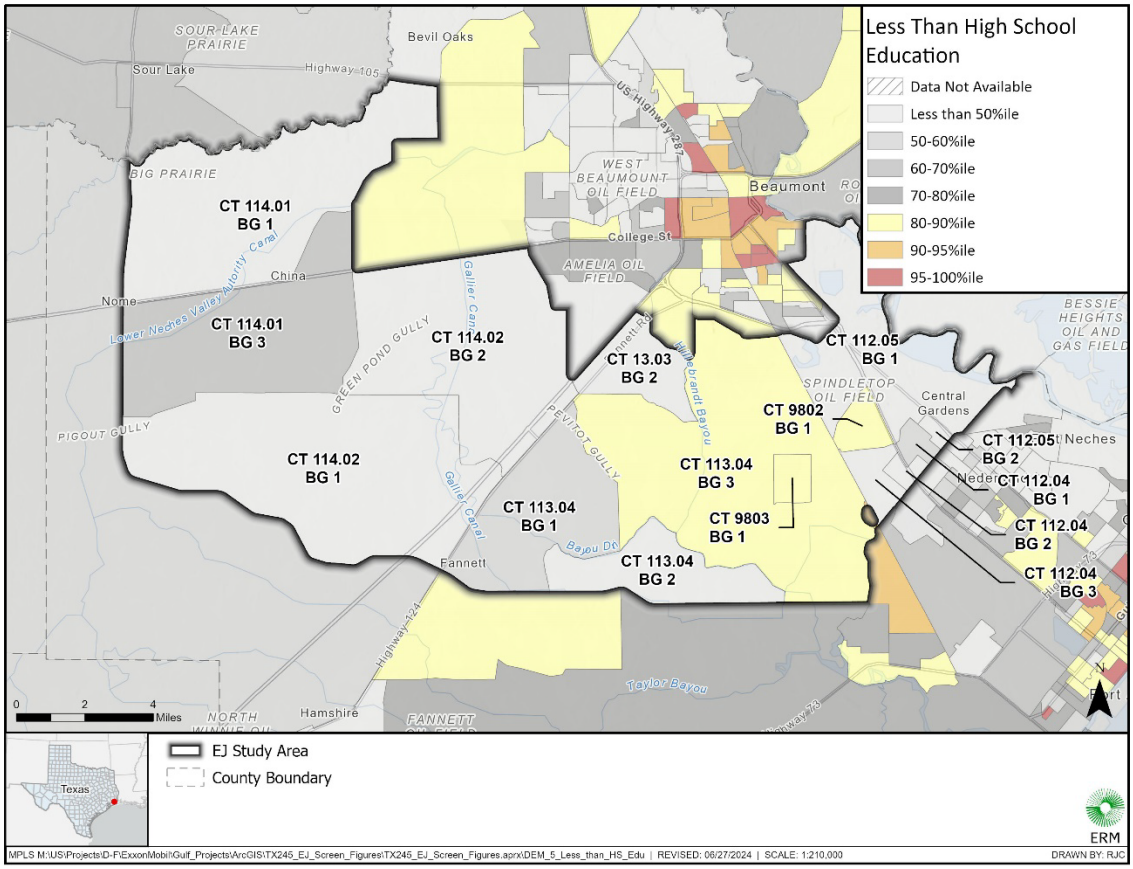


Figure 5: Population Under Age 5 in the EJ Study Area—National Percentile Rankings

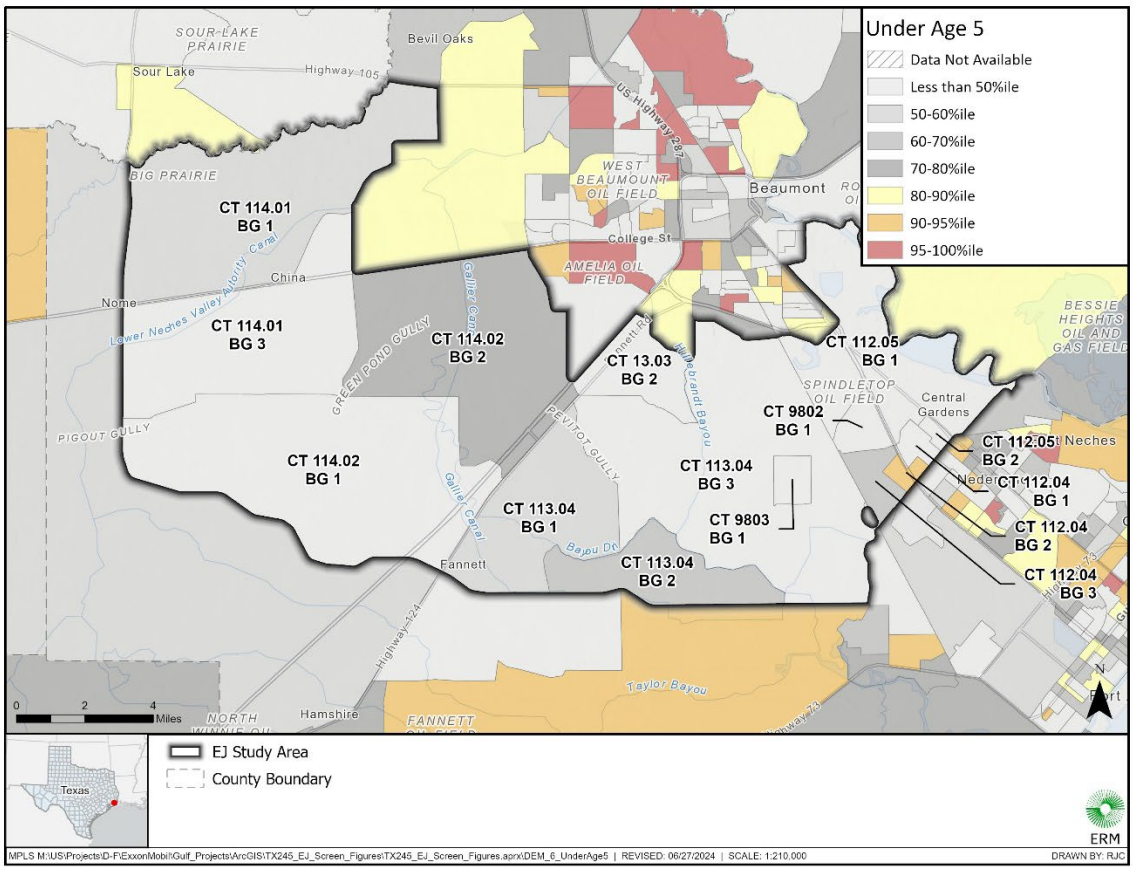
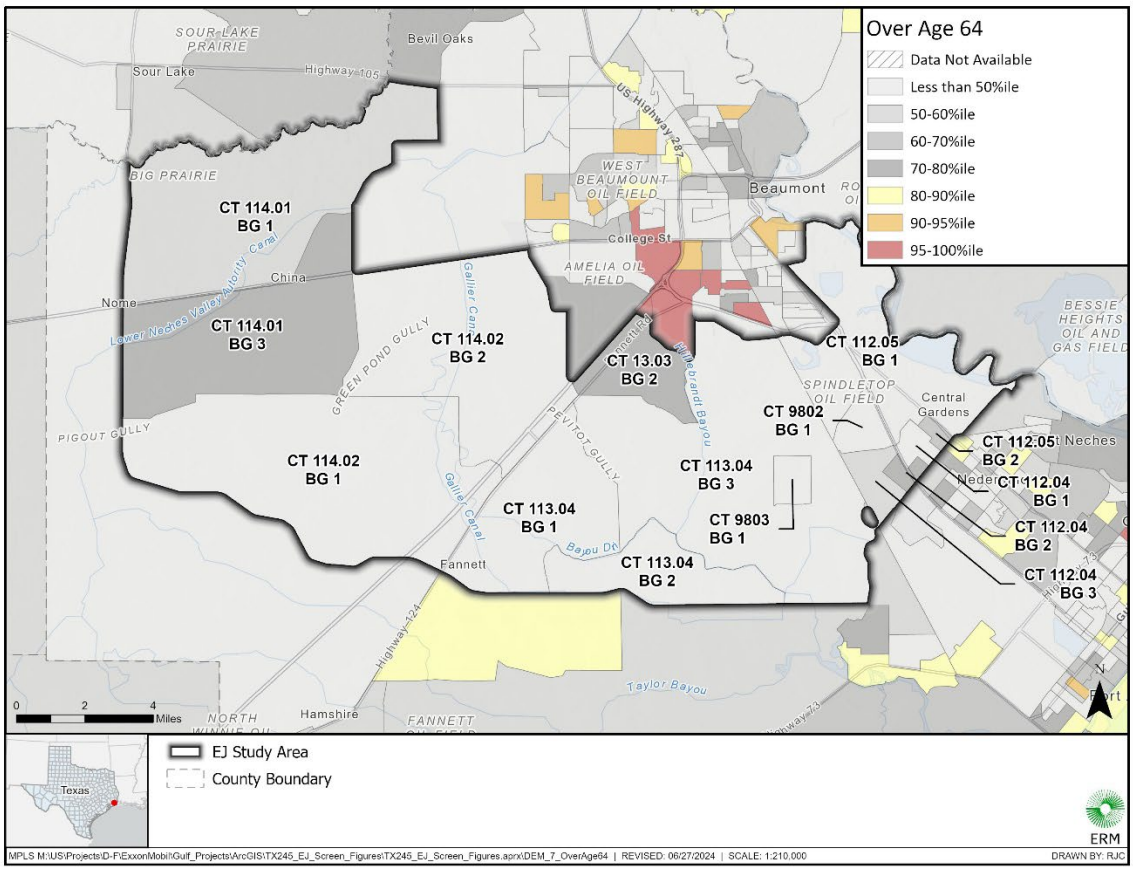


Figure 6: Population Over Age 64 in the EJ Study Area—State Percentile Rankings



2.0 Environmental Indicators

The EJScreen Tool has 13 environmental indicators displayed as layers under "pollution and sources." Table 2 presents percentile rankings statewide and nationally for each of the environmental indicators for each CBG in the EJ Study Area. The CBG environmental indicators at or above the 80th percentile either nationally or statewide are as follows:

- Air Toxics Cancer Risk—11 of 15 CBGs (nationally and statewide);
- Air Toxics Respiratory Hazard Index—10 of 15 CBGs (statewide);
- Toxic Releases to Air—All 15 CBGs (nationally and statewide);
- Lead Paint Indicator—CT 112.05 BG 1 (statewide);
- Risk Management Plan (RMP) Proximity—9 of 15 CBGs (nationally and statewide);
- Hazardous Waste Proximity—CT 112.05 BG 1 and CT 9802 BG 1 (statewide); and
- Wastewater Discharge Indicators—4 of 15 CBGs (nationally and statewide).

Environmental indicators ranked at or above the 80th percentile occur with greater frequency in the eastern portion of the Project Footprint near Central Gardens and the Neches River.

Figures 8 through 14 show graphical data for the EJ Study Area percentiles for the environmental indicators ranked at or above the 80th percentile nationally (for indicators at or exceeding 80th percentiles nationally) or statewide (for indicators at or exceeding 80th percentiles statewide but not nationally).

The EJScreen Tool also calculates EJ Indexes for each of the 13 environmental indicators by combining each environmental indicator with demographic indicators. The EJ Index can be used to highlight CBGs with a comparatively elevated intersection of an environmental indicator and low-income or people of color populations. The EJ Indexes can be viewed in the main report.

Table 2: EJScreen Environmental Indicator National and Statewide Percentile Rankings for Jefferson County and the Census Block Groups in the EJ Study Area

Environmental Indicator																
Location	Jefferson County	CT 13.03 BG 2	CT 112.04 BG 1	CT 112.04 BG 2	CT 112.04 BG 3	CT 112.05 BG 1	CT 112.05 BG 2	CT 113.04 BG 1	CT 113.04 BG 2	CT 113.04 BG 3	CT 114.01 BG 1	CT 114.01 BG 3	CT 114.02 BG 1	CT 114.02 BG 2	CT 9802 BG 1	CT 9803 BG 1
Particulate Matter ($PM_{2.5}$ in micrograms per cubic meter [$\mu g/m^3$])	24th / 67th	25th / 68th	28th / 70th	28th / 70th	28th / 70th	28th / 70th	28th / 70st	22nd / 65th	22nd / 65th	22nd / 65th	64th / 31st	20th / 63rd	20th / 63rd	20th / 63rd	26th / 69th	24th / 67th
Ozone (parts per billion [ppb])	39th / 64th	30th / 59th	44th / 67th	44th / 67th	44th / 67th	44th / 67th	44th / 67th	37th / 63rd	37th / 63rd	37th / 63rd	31st / 10th	19th / 49th	19th / 49th	19th / 49th	45th / 68th	45th / 68th
Diesel PM ($\mu g/m^3$)	63rd / 59th	66th / 61st	56th / 54th	56th / 54th	56th / 54th	56th / 54th	56th / 54th	28th / 27th	28th / 27th	28th / 27th	19th / 21st	30th / 29th	30th / 29th	30th / 29th	57th / 55th	33rd / 32nd
Air Toxics Cancer Risk (risk per lifetime per million)	**97th / 94th**	**89th / 94th**	**97th / 94th**	**97th / 94th**	**97th / 94th**	**97th / 94th**	**97th / 94th**	**97th / 94th**	**97th / 94th**	**97th / 94th**	NA	44th / 52nd	44th / 52nd	44th / 52nd	**97th / 94th**	**97th / 94th**
Air Toxics Respiratory Hazard Index	29th / 31st	**80th** / 70th	**80th** / 70th	**80th** / 70th	**80th** / 70th	**80th** / 70th	**80th** / 70th	29th / 31st	29th / 31st	29th / 31st	NA	**80th** / 70th	**80th** / 70th	**80th** / 70th	**80th** / 70th	29th / 31st
Toxic Releases to Air	**98th / 99th**	**85th / 96th**	**96th / 99th**	**96th / 99th**	**95th / 98th**	**96th / 99th**	**97th / 99th**	**84th / 96th**	**82nd/ 95th**	**88th / 97th**	**93rd / 80th**	**80th / 94th**	**81st / 94th**	**90th / 97th**	**94th / 98th**	**91st / 98th**
Traffic Proximity and Volume (daily traffic count/distance to road)	61st / 60th	33rd / 37th	44th / 47th	58th / 58th	26th / 32nd	56th / 56th	57th / 57th	20th / 25th	5th / 8th	5th / 8th	18th / 16th	24th / 29th	28th / 33rd	18th / 23rd	35th / 39th	5th / 8th

Environmental Indicator																
Location	Jefferson County	CT 13.03 BG 2	CT 112.04 BG 1	CT 112.04 BG 2	CT 112.04 BG 3	CT 112.05 BG 1	CT 112.05 BG 2	CT 113.04 BG 1	CT 113.04 BG 2	CT 113.04 BG 3	CT 114.01 BG 1	CT 114.01 BG 3	CT 114.02 BG 1	CT 114.02 BG 2	CT 9802 BG 1	CT 9803 BG 1
Lead Paint Indicator (% pre-1960s housing)	72nd / 50th	61st / 38th	0 / 0	53rd / 30th	60th / 37th	**84th** / 67th	60th / 36th	36th / 17th	60th / 37th	60th / 37th	41st / 64th	42nd / 21st	67th / 44th	55th/3 2nd	0 / 0	0 /0
Superfund Proximity (site count/km distance)	76th / 65th	50th / 38th	77th / 67th	77th / 66th	73rd / 62nd	76th / 65th	79th / 69th	43rd / 31st	54th / 41st	59th / 46th	0 / 0	37th / 25th	40th / 28th	41st / 29th	70th / 58th	64th / 52nd
RMP Proximity (facility count/km distance)	**91st / 95th**	57th / 71st	**97th / 98th**	**93rd / 96th**	**90th / 94th**	**99th / 99th**	**98th / 99th**	51st / 67th	59th / 73rd	68th / **80th**	62nd / 41st	16th / 30th	40th / 58th	**81st / 88th**	**97th / 98th**	76th/ **85th**
Hazardous Waste Proximity (facility count/km distance)	76th / 61st	43rd / 37th	78th / 62nd	67th / 54th	68th / 55th	**89th** / 73rd	79th / 63rd	63rd / 51st	28th / 25th	53rd / 44th	27th / 30th	22nd / 20th	55th / 46th	79th / 63rd	**86th** / 70th	57th / 47th
Underground Storage Tank Indicator	67th / 65th	46th / 51st	39th / 46th	42nd / 48th	18th / 27th	31st / 40th	40th / 46th	26th / 35th	20th / 29th	15th / 24th	35th / 21st	19th / 28th	20th / 29th	20th / 30th	22nd / 32nd	35th / 43rd
Wastewater Discharge Indicators (toxicity-weighted concentration/km distance)	**95th / 88th**	**98th / 93rd**	21st / 27th	18th / 25th	30th / 35th	31st / 35th	15th / 22nd	36th / 40th	**93rd / 86th**	**94th / 88th**	24th / 23rd	24th / 29th	38th / 41st	56th / 56th	19th / 25th	**83rd** / 76th
Data Source: EPA, 2023 and June 2024 (CT 114.01 BG 1 added)																

Figure 7: Air Toxics Cancer Risk—National Percentile Rankings

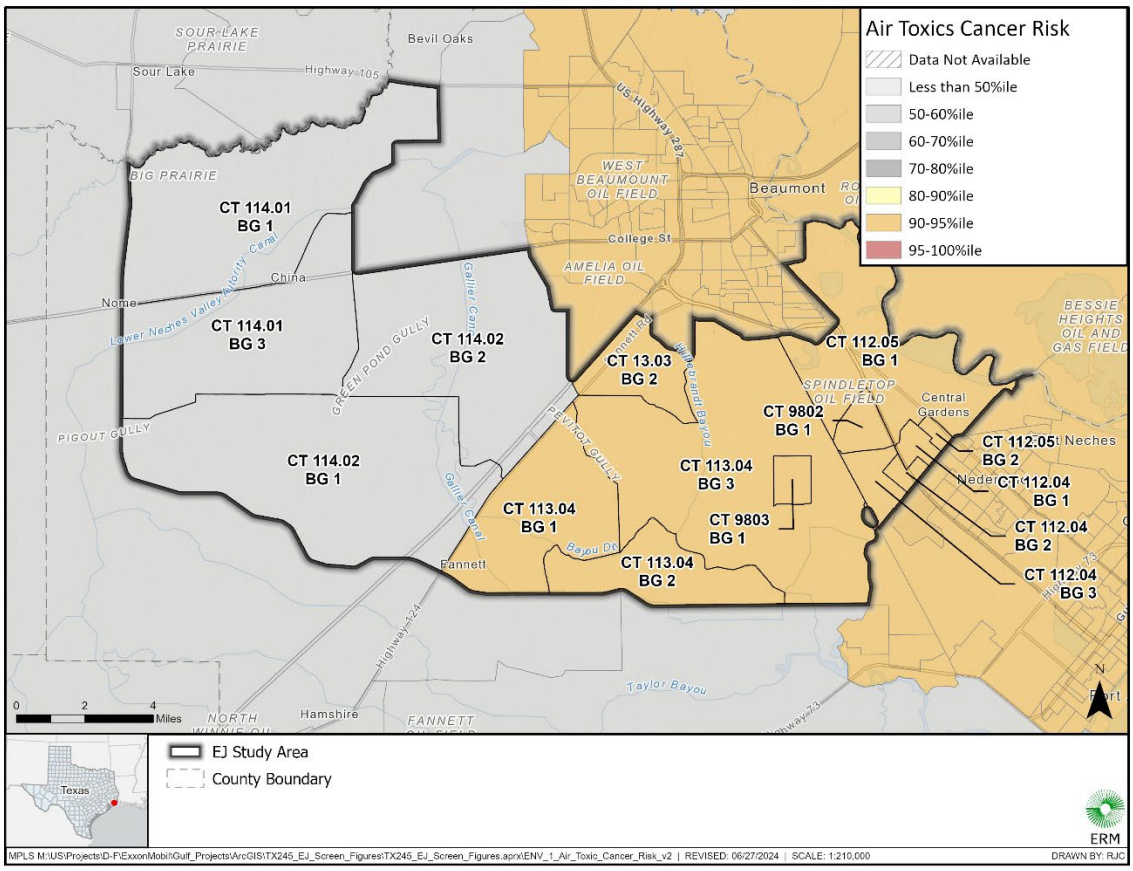


Figure 8: Air Toxics Respiratory Hazard Index—State Percentile Rankings

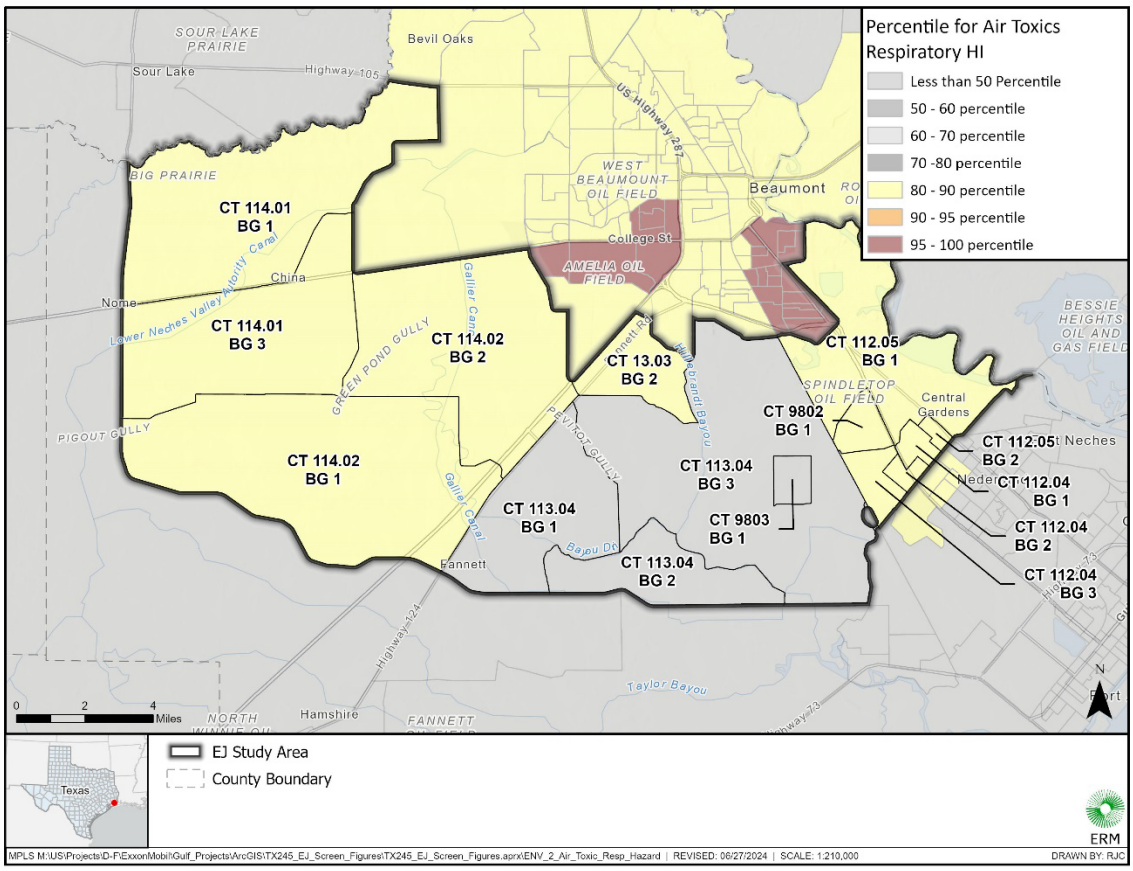


Figure 9: Toxic Releases to Air—National Percentile Rankings

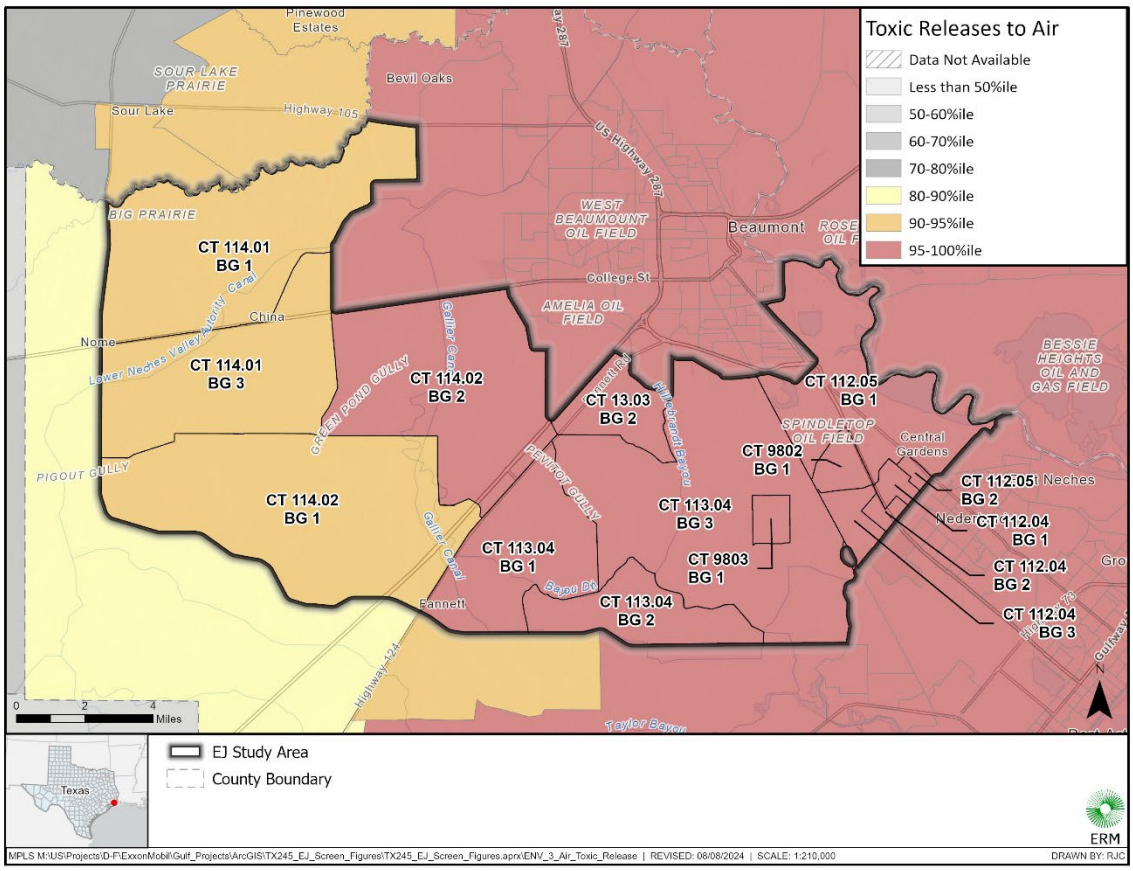


Figure 10: Lead Paint Indicator—State Percentile Rankings

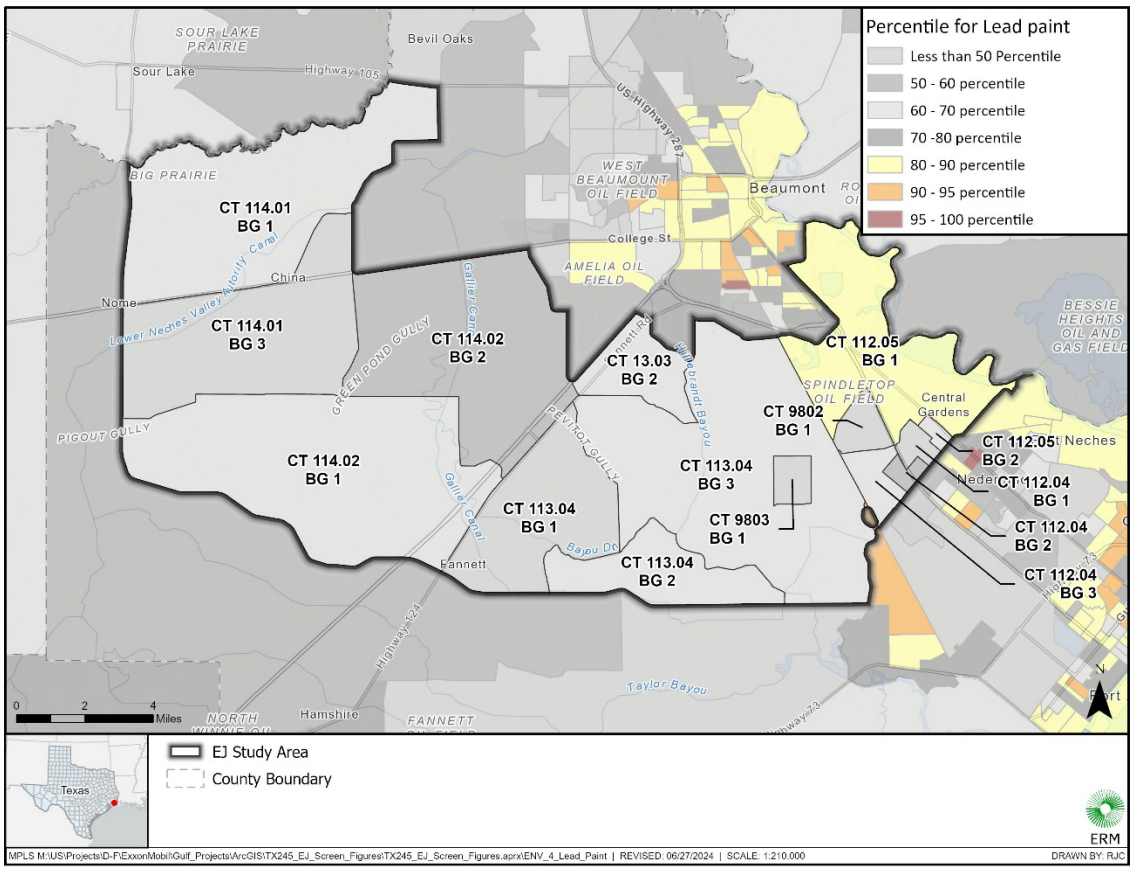


Figure 11: RMP Facility Proximity—National Percentile Rankings

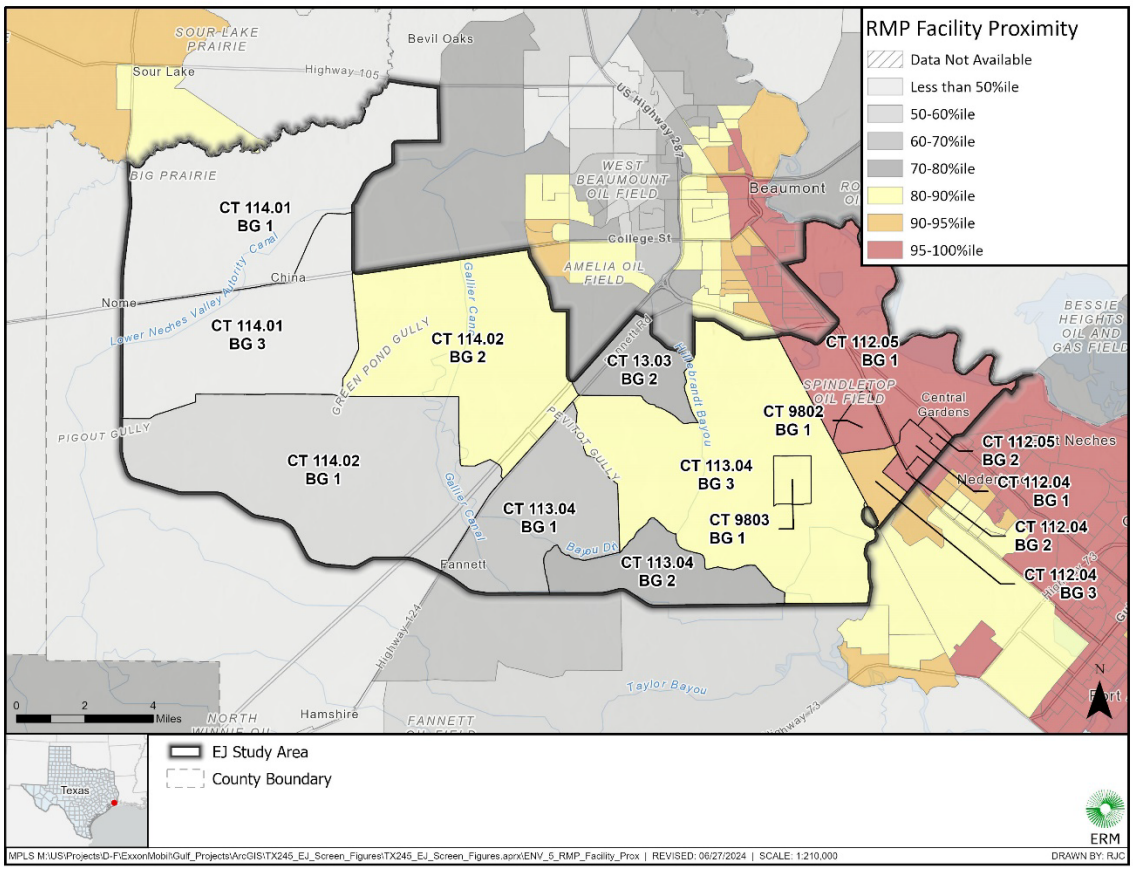


Figure 12: Hazardous Waste Proximity—State Percentile Rankings

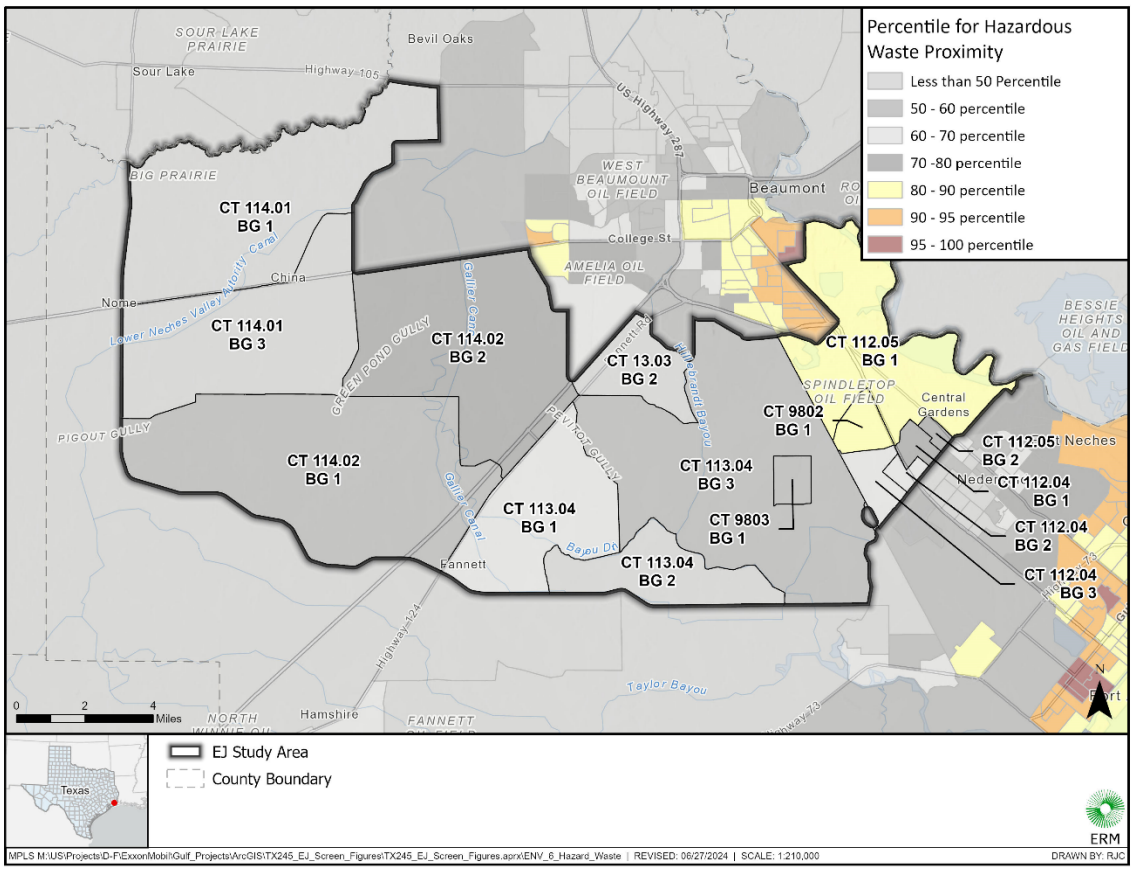
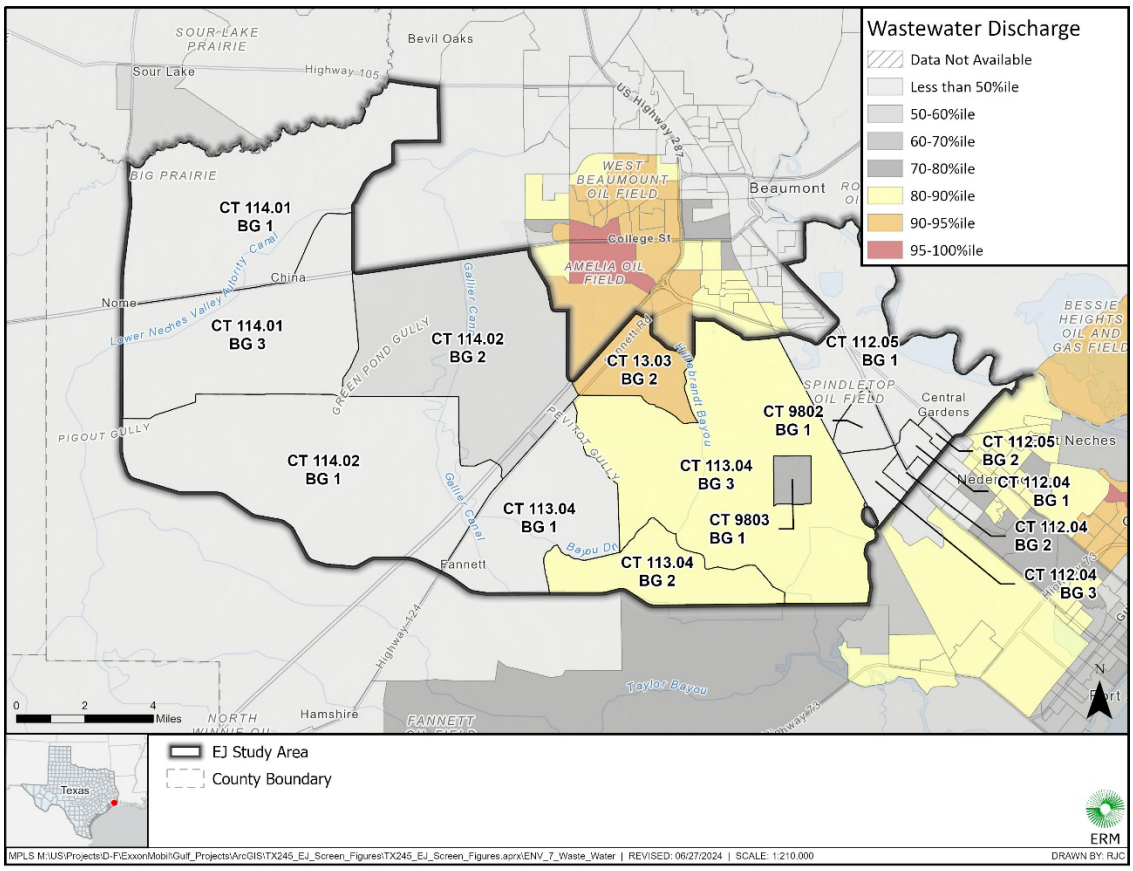


Figure 13: Wastewater Discharge Indicators—National Percentile Rankings



3.0 References

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Appendix K.3 – Summary of Community Feedback

Stakeholder feedback is being received through the Community Grievance Mechanism (CCGM), initial field work for the development of the Project Local Economic Development Plan, and continuous engagement. Table 1 presents a summary of feedback, actions being taken by the Project, and planned in response to such feedback.

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Table 1. Summary of community feedback and incorporation into project actions

Community Feedback		Incorporation of Community Feedback into Project Actions	
Topic	**Feedback**	**Actions Taken to-date**	**Future Actions**
Emergency Response	Emergency Service Districts (ESD) staffed on volunteer basis leading to delays in responding to emergencies. Gaps in full time emergency response staffing.	Ongoing engagement with local ESDs.	Evaluate potential for grants to pay for full-time staff at ESD 3 & 4, and engage with Jefferson County Emergency Management to potentially support writing of grants for funding of positions
	Need for emergency response equipment (i.e. self contained breathing apparatuses (SCBAs), SCBA refill station, two way radios and brush buggies) for local ESDs	Provided commitment letter to reimburse departments for each to obtain 10 radios, chargers, 20 batteries, brush buggy, and a brush truck	Work with emergency responders to identify additional opportunities to fund ESD equipment needs, including response equipment / vehicles for environments with limited O2, air respirators, monitors, oxygen replenishment station, ATVs, etc.
	ESDs are not trained / equipped for CO2 emergency events	Sponsored Jefferson County firefighters to complete HazMat Liquid & CO2 Pipeline and Industrial Fire Emergencies training at Texas A&M Engineering Extension Service (TEEX). Sponsoring 6 additional local firefighters to attend September 2024 TEEX training.	Potentially sponsor/recruit additional firefighters in local ESDs for future trainings
	Need for disaster preparation and recovery resources	Donated $25k to Jefferson County Long Term Recovery Group	Evaluate potential future opportunities
Health, Safety and Environment	Questions and concerns referencing past CO2 release incidents	Shared lessons learned and actions implemented following historic CO2 release incidents	Conduct community engagement on project-specific emergency response plan once completed
		Provided explanation of ExxonMobil's 24/7 operating system, which includes monitoring, automated and manual actions taken in case of release incident, and emergency response plans for analogous projects	Share dispersion models of CO2 incident scenarios for the Project
	Request for CO2 surface monitoring with data available to the community	While the CCS system being implemented is inherently designed to operate safely without CO2 monitoring on the surface, ExxonMobil has committed to study the use of CO2 surface monitors near residential areas in the vicinity of Project operations	Real time CO2 monitoring results could be made available to the community
	Questions and concerns regarding CO2 leaking from injection zone to groundwater and surface	Distributed copies of EPA's "How EPA's UIC Class VI Regulations Work to Ensure the Protection of Groundwater Resources" in community engagements	Provide the community further details on the operations and monitoring practices
		Explained testing and monitoring plans for project operational phase	
		Utilized appraisal well core to provide information on confining zone and thickness	Evaluate potential collaboration with Rice University Tapia Center to conduct a family night event that includes hands-on activities for adults and children to better understand CCS
	Potential proximity of project to elementary school	Provided detailed map of wells location to highlight distance from school	Provide information on plume and dispersion models for awareness

Community Feedback		Incorporation of Community Feedback into Project Actions	
Topic	**Feedback**	**Actions Taken to-date**	**Future Actions**
Community Impacts	Noise and vibration impact from appraisal well drilling	Implemented a noise monitoring program	Continue to monitor noise levels throughout duration of drilling activities
		Planned subsequent drilling operations to reduce noise and nuisance at night	
		Designed well pad (closest to community) to increase distance between noise producing equipment and the community	
	Construction traffic on community roads	Road permit obtained to route traffic away from community roads	Continue to monitor and verify construction traffic through construction
		Contractors / subcontractors directed on traffic paths	
	Community benefits	Completed initial local economic development plan (LEDP) stakeholder interviews and focus group discussions	Test initial LEDP outputs with community and representatives to validate value and priorities, aligning on implementation of mutually agreed programs. Finalize plan to begin phased implementation of programming
	Educational gaps in STEM and skilled trades		Evaluate potential opportunities to implement activities such as, but not limited to, K-12 STEM program, promote skilled trades, facilitate a mentoring program for high school students, coordinate educational tours to ExxonMobil facilities, and implement scholarships for college/trade schools
			Evaluate potential collaboration with Rice University Tapia Center to conduct a family night event that includes hands-on activities for adults and children to better understand CCS
	Community infrastructure improvement needs (e.g., natural gas, broadband, city water, sewer access)	Engaged with elected and county officials on options and means of supporting community infrastructure investments.	Evaluate potential opportunities to facilitate provision of community infrastructure improvement needs
	Community service gaps (e.g. food security, childcare, recreational activities, housing, health care)	Commitment made to precinct commissioner to support funding of improvements to a Cheek community gathering area	Evaluate potential opportunities to increase food security, childcare, housing improvements in the community through United Way or other non-profit organizations
	CCS is new in residential areas and property values will be negatively impacted		Conduct third party evaluation of residential property value impact using analogous projects; share summary results with community once completed
Communication / Transparency	Gaps in community awareness related to the Project	Engagements, such as 1:1 meetings, larger group settings, and smaller engagements with community members and local stakeholders have been conducted and are ongoing	Continue engagement with community and local stakeholders throughout life cycle of the Project

Community Feedback		Incorporation of Community Feedback into Project Actions	
Topic	**Feedback**	**Actions Taken to-date**	**Future Actions**
		Provided contact information (phone and email) for additional questions/follow-up engagements	Develop project specific website to share updates and information
	Townhall format is preferred by community for large group settings to receive project information, ask questions, and address concerns	Participated in Diamond D / Pine Island HOA townhall style meeting to provide project and CCS overview, listen to community concerns, and provide responses to community questions	Future engagements may consider townhall format, among other forms of engagement, if aligned with community needs
		Participated in Cheek Community townhall style meeting to listen to community feedback/concerns and provide responses to community questions	
	Gap in community understanding of CCS and Class VI permit process and requirements	Distributed copies of Rose CCS flyer and EPA's "How EPA's UIC Class VI Regulations Work to Ensure the Protection of Groundwater Resources" in community engagements	Evaluate potential collaboration with Rice University Tapia Center to conduct a family night event that includes hands-on activities for adults and children to better understand CCS
Site Selection/ Land	Site selection driven by racial / socioeconomic factors	Provided overview of site selection process and factors considered to select storage sites (geology, proximity to emitters, infrastructure, skilled labor)	Evaluate providing additional supporting information from geotechnical and emitter studies
	CO2 injection below properties without necessary rights	Clarification provided that CO2 injection would be performed only in accordance with applicable law	Continued engagement, if aligned with community needs.
	Surface property encumbered by CCS facilities	The Project did not contemplate or plan well sites on impacted community members' property. For clarity, the concerned residents' lease agreements are being amended to expressly remove surface access/ use rights with the exception of those required to address emergencies. .	Continued engagement, if aligned with community needs.
Education	Local workforce growth and development	Implemented $25k endowed scholarship at Lamar Institute of Technology for Cheek community residents	Evaluate potential support opportunities such as, but not limited to, 100 Black Men of Greater Beaumont (STEM mentorship program), workforce capacity training for suppliers (i.e. certification, bidding, industry standards, etc.), subsidization of certification fees for minority, women and veteran suppliers, other workforce related training/scholarships

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Appendix L References

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