

UIC CLASS VI GEOLOGIC STORAGE OF CO₂ PERMIT APPLICATION

Dusek CCS #2 Well

Upton County, Texas

Section 9: Financial Assurance Demonstration Plan (FADP)

[40 CFR §146.82 (a), §146.85]

Prepared for:

EPA Region 6

Underground Injection Control Section

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Glossary of Acronyms, Abbreviations and Terms

Glossary of Acronyms, Abbreviations and Terms for All Permit Sections: 1-12	
Acronym / Abbreviation / Term	Definition / Meaning
1-D	one-dimensional
2-D	two-dimensional
3-D	three-dimensional
4-D	four-dimensional
ACS	American Community Survey
AES	atomic emission spectrometry
AMA	active monitoring area
AMPP	Association for Materials Protection and Performance
AMS	accelerator mass spectrometry
AoR	area of review
API	American Petroleum Institute
ASTM	American Society for Testing and Materials
AVO	amplitude variation with offset
AZMI	above-zone monitoring interval
bbl(s)	barrel(s)
Bcf	billion cubic feet – standard unit of measurement for natural gas
BEG	Bureau of Economic Geology
BET	Brunauer-Emmett-Teller analysis
BHA	bottomhole assembly
BHP	bottomhole pressure
BHIP	bottomhole injection pressure
BHT	borehole temperature
BNI	BNI Coal, Inc.
BOP	blowout preventer
BOPE	blowout preventer equipment
bpm	barrels per minute
BTC	buttruss-thread and coupled
CBL	cement bond log
CBP	Central Basin Platform
CCP	corrosion control program
CCS	carbon capture and storage
CCUS	carbon capture utilization and storage

Glossary of Acronyms, Abbreviations and Terms for All Permit Sections: 1-12

Acronym / Abbreviation / Term	Definition / Meaning
CFR	Code of Federal Regulations
cm	centimeter
CMG	Computer Modelling Group Ltd.
CO ₂	carbon dioxide
CRA	corrosion resistant alloys
DAS	distributed acoustic sensing
DIC	dissolved inorganic carbon
DOT	U.S. Department of Transportation
°	degree symbol/glyph used to represent degrees of an arc (i.e., geographic coordinate systems), and degrees of temperature
DST	drill stem test
DTS	distributed temperature sensing
EC	electric conductivity
EJ	environmental justice
EM	electromagnetic
EOR	enhanced oil recovery
EOS	equation of state
EPA	U.S. Environmental Protection Agency
ERCOT	Electric Reliability Council of Texas
ERR	emergency or remedial response
ERRP	emergency and remedial response plan
ESD	Emergency Shutdown
°F	degree Fahrenheit
F/ft	Fahrenheit per foot
FADP	financial assurance demonstration plan
FM	farm-to-market
FMI	formation microimaging
FOC	fiber optic cable
FS	field superintendent
FSP	fault slippage potential
ft	foot
GAU	Groundwater Advisory Unit
GC	gas chromatography
g/cm ³	gram per cubic centimeter
GEM	generalized equation-of-state model
GFCI	ground fault circuit interrupter
GHG	greenhouse gas
GHGRP	Greenhouse Gas Reporting Program
GR	gamma ray
GSDDT	Geologic Sequestration Data Tool – EPA's centralized, web-based system
h	hour
H ₂ S	hydrogen sulfide
HI	health index
HSE	health and safety and the environment
ICP	inductively coupled plasma
ID	inside diameter
in.	inch
Injection Unit	[REDACTED]
Injection Interval	[REDACTED] Interchangeable with "Injection Zone"
km	kilometer
KNN	k-nearest neighbor algorithm (also known as k-NN)
Kv	vertical permeability
L	liter
lb	pound

Glossary of Acronyms, Abbreviations and Terms for All Permit Sections: 1-12

Acronym / Abbreviation / Term	Definition / Meaning
LUST	leaking underground storage tank
M	magnitude
m	meter
<i>m</i>	cementation exponent
MASP	maximum anticipated surface pressure
Mcf	unit of volume equal to one thousand cubic feet
MICP	mercury injection capillary pressure
mD	millidarcy
MD	measured depth
MES	Milestone Environmental Services, LLC
mg	milligram
mg/L	milligram per liter
MICP	mercury injection capillary pressure
Midstream companies	operate the pipeline and gathering or transmission facilities that move the gas from the well (upstream) to our homes and businesses (downstream).
Milestone	Milestone Carbon Midland CCS Hub, LLC
mi	mile(s)
MIT	mechanical integrity test
mm	millimeter
MMscf/d	million standard cubic foot per day
MMt	million metric tonne
MMta	million metric tonne per annum (year)
MMT/yr	million tonne per year
mol%	mole percent
MPa	megapascal
MPSI	million pounds per square inch
MRV	monitoring, reporting, and verification
MS	mass spectrometry
MSIP	maximum surface injection pressure
MVA	monitoring, verification, and accounting
MWD	measurement while drilling
Mya	millions of years ago
<i>n</i>	exponent in the relation to water saturation
nD	nanodarcy
nm	nanometer
NMR	nuclear magnetic resonance
NPL	EPA's Superfund NPL: National Priorities List of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories
NU	nipple up
NW	northwest
O ₂	oxygen
P&A	plug and abandon
PBR	polished borehole receptacle
PEF	photoelectric factor
PISC	post-injection site care
PNL	pulsed neutron log
POD	points of diversion
ppb	parts per billion
ppf	pound per foot
ppg	pound per gallon
ppm	part per million
ppmv	part per million volume
PSD	prevention of significant deterioration
psi	pound per square inch
Psi/ft.	pound per square inch per foot
P/T	pressure/temperature

Glossary of Acronyms, Abbreviations and Terms for All Permit Sections: 1-12

Acronym / Abbreviation / Term	Definition / Meaning
QA	quality assurance
QASP	quality assurance and surveillance plan
QC	quality control
QCSP	quality control and surveillance plan
RCRA	Resource Conservation and Recovery Act
RST	reservoir saturation tool
RRC	Railroad Commission of Texas
RU	rig up
R _w	resistivity of water
RWP	rated working pressure
§	typographical character for referencing individually numbered sections
sc-CO ₂	supercritical CO ₂
SAU	storage assessment unit, a USGS term related to CO ₂ storage resources
SCADA	supervisory control and data acquisition
sDAS	seismic distributed acoustic sensing
SDRDB	Submitted Drillers Reports Database (a TWDB database on water wells)
SGS	sequential gaussian simulation
SIS	sequential indicator simulation
SMEs	subject matter experts
[REDACTED]	[REDACTED]
SP	spontaneous potential
Sq. mi	square mile
SWC	sidewall coring
TCEQ	Texas Commission on Environmental Quality
TCEQ Central Registry	provides a centralized location for core information about those TCEQ regulates, such as company names, addresses, and telephone numbers
TD	total depth
TDS	total dissolved solids
TEC	tubing encapsulated conductor
TF	task force
TIC	total inorganic carbon
TIH	trip in hole
TOC	total organic carbon
Top Seal	[REDACTED], interchangeable with Upper Confining Layer
TRI	toxic release inventory
TSDF	treatment, storage, and disposal facility
TVD	true vertical depth
TVDSS	true vertical depth subsea
TWDB	Texas Water Development Board
uD	microdarcy
UIC	underground injection control
ug/m ³	micrograms per meters cubed
Upper Confining Layer	[REDACTED], interchangeable with Top Seal or Upper Confining Unit or Upper Confining Zone
UCL	Upper Confining Layer
Upper Confining Unit	[REDACTED]
USD	U.S. Dollar
USDW	underground source of drinking water
USGS	U.S. Geological Survey
USIT	ultrasonic imaging tool
UST	underground storage tank
VCP	vertical proportion concentration
VSP	vertical seismic profile
VTI	vertically transverse isotropy
XRD	x-ray diffraction

9.0 FINANCIAL ASSURANCE DEMONSTRATION PLAN (FADP) [CFR 146.82(a)(14) and 146.85 (a)]

[REDACTED]

[REDACTED] In compliance with 40 CFR 146.85(a)(4), these instruments will provide that they may not be cancelled or terminated except due to failure to make payment and, in such event, the cancellation or termination may not be final until 120 days after receipt of cancellation or termination notice mailed to Milestone and the permitting authority.

9.1 Approach to Meeting Financial Responsibility Requirements

[REDACTED]

9.1.1 [REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]

- [REDACTED]

9.1.2 [REDACTED]

[REDACTED]

9.2 Corrective Action Plan

The detailed AoR and Correction Action Plan are located in **Section 3** of this application. [REDACTED]

[REDACTED] The AoR will be re-evaluated every five (5) years to determine if any new penetrations have occurred and whether such penetrations require corrective action.

9.3 Injection Well-Plugging Program [146.92 (b) (3) (4) (5) (6) (c) (d)]

[REDACTED] The specifics of the plugging program can be found in **Section 6** of our permit application. [REDACTED]

9.4 Post-injection Site Care and Facility Closure

[REDACTED]. Details of the activities and actions contained in the PISC can be found in **Section 7**. [REDACTED]

9.5 Emergency & Remedial Plan

The Emergency and Remedial Response Plan (ERRP) and associated detailed assessment can be found in **Section 8** of this permit application.

Milestone conservatively estimated costs associated with emergency and remedial response related to each of the emergency events described in **Section 8** (ERRP) of this application, including well integrity failure or loss of mechanical integrity, injection well monitoring equipment failure, a spill, CO₂ or subsurface fluid migration out of the injection zone, damage due to a natural disaster, and damage due to induced seismicity. The activities related to these ERRP events, as provided by Milestone, are presented in **Section 8 -Tables 70-76**. Estimated costs associated with ERRP events are shown in **Table 83**.

[REDACTED]

[REDACTED]

[REDACTED]. However, as part of the reactive response scenario contemplated in the ERRP cost estimate, Milestone assessed the specific response actions and cost data to represent the likely impact of such an event on sources of drinking water. Milestone will utilize its Spill Control and Prevention Plan in combination with the response strategy to minimize this portion of environmental repair. [REDACTED]

[REDACTED]

9.6 Cost Estimates

Tables in this section provide a detailed estimate, in current dollars, of the cost of performing corrective actions on wells in the AoR, plugging the injection well, post-injection site care and facility closure, and emergency and remedial response. **Table 79** is a summary of the cost estimates underlying the FADP document, identifying proposed financial instrument(s) that will provide the appropriate assurance to regulatory agencies of Milestone's intent and ability to fulfill its responsibilities.

Cost estimates assume that these costs would be incurred if a third party was contracted to perform these activities. For that reason, the estimate includes costs such as project management and oversight, general and administrative costs, and overhead during the post-injection period, e.g., the use of post-injection seismic surveys.

These values are subject to change.

If the cost estimates change, Milestone will adjust the value of the financial instruments, and any adjustment will be submitted for approval as required under 40 CFR §146.85(a)(5).

The total estimated costs of each of these activities, as provided by Milestone, are presented in **Table 79**. Detailed cost estimates for each major category in **Table 79** are found in **Tables 80-83**.





