APPENDIX E

TESTING AND MONITORING PLAN
40 CFR 146.90; 146.82(A)(15)

West Bay Storage Facility

1 FACILITY INFORMATION

Facility Name: West Bay Storage Facility

Facility Contact: [redacted]
501 Westlake Park Blvd., Houston, Texas 77079
[redacted]

Well Location: Galveston County, TX

[redacted]

2 INTRODUCTION

This Testing and Monitoring Plan (Plan) describes how BP Carbon Solutions LLC (BP) plans to monitor the West Bay Storage Facility (Site) pursuant to 40 Code of Federal Regulations (CFR) 146.90. In addition to providing a basis to demonstrate that the wells are operating as planned, this Plan is designed to demonstrate that the carbon dioxide (CO_2) plume and pressure fronts remain in the confining zone, as predicted, and that underground sources of drinking water (USDW) are not endangered. [redacted] the monitoring data developed under this Plan will also be used to validate and adjust the geological and dynamic models used to predict the distribution of the CO_2 within the storage zone, to support Area of Review (AoR) reevaluations, and to inform whether modifications to this Plan are needed. Although unlikely, results of the testing and monitoring activities described below could also lead to action according to the Emergency and Remedial Response Plan (ERRP) (**Appendix H**).

3 OVERALL STRATEGY AND APPROACH FOR TESTING AND MONITORING

In accordance with 40 CFR 146.90, BP has prepared a testing and monitoring plan to ensure that the geologic sequestration Site will be operated in accordance with the regulatory framework, while protecting the USDWs.

An AoR delineation model was constructed using a comprehensive data set as further described in **Section 2** (Site Characterization) of the **Application Narrative**. [redacted]

[redacted]

T[redacted] (**Section 2.3** (Faults and Fractures) of the **Application Narrative**). An overview of components of the Testing and Monitoring Plan are set forth below with further details provided in the following sections.

3.1 CO_2 Stream Monitoring [40 CFR 146.90(a)]

The injected CO_2 stream will be analyzed with sufficient frequency to yield data representative of its chemical and physical characteristics and to ensure that the CO_2 stream meets the specifications outlined in this application.[redacted] As part of the instrumentation and control systems, monitoring will include pressure, temperature, volume, and flow rate. Sampling details and frequency are described in more detail in **Section 4.1** (Sampling Location and Frequency).

3.2 Operational Monitoring [40 CFR 146.88(e)(1), 146.89(b), and 146.90(b)]

Continuous recording devices on the injection wells will be used to monitor: (i) injection pressure, rate, and volume; (ii) the pressure on the annulus between the tubing and the long string casing; (iii) the annulus fluid volume added; and (iv) the temperature of the CO_2 stream. Instruments will be calibrated annually in accordance with industry standards. Critical system parameters will have continuous electronic monitoring with signals transmitted back to a master control system. Well by well data trends that are steady and predictable, and in accordance with both CO_2 volumes supplied for injection and expected reservoir pressure increases from injection, will suggest the presence of satisfactory mechanical integrity. Rapid changes in

parameters such as annulus pressure, fluid added to the annulus, and injection rate, or unexpected trends in these data, may provide cause for an investigation of mechanical integrity.

If significant deviations are identified from expected operational characteristics and a loss of mechanical integrity is discovered, BP will cease injection and follow the procedures as per 40 CFR 146.88(f) prior to resuming injection.

Corrosion in the pipeline, long string casing, injection tubing and wellhead will be monitored using the corrosion coupon method on a quarterly basis for the duration of the injection period.

3.3 Groundwater Geochemical Monitoring Above the Confining Zone [40 CFR 146.90(d)]

The overall strategy for testing and monitoring groundwater above the confining zone is to set up a network of monitoring wells in strategic locations that will detect any potential fluid migration early so that it can be addressed. [redacted] Monitoring wells will be placed hydraulically downgradient of potential injection well leak points and upgradient of existing water wells to warn of potential leakage.

3.4 Carbon Dioxide Plume and Pressure-Front Tracking [40 CFR 146.90(g)]

BP will employ direct and indirect methods to track the extent of the CO_2 plume and the presence or absence of elevated pressure during the operation period to meet the requirements of 40 CFR 146.90(g). BP intends to supplement this plan with additional data from the Nonagon #1 appraisal well, once available, as well as the dynamic simulation model, geologic site characteristics, and other relevant information sources.

3.5 Faults [40 CFR 146.82(a)(3)(ii)]

[redacted]

[redacted]

3.6 Responsibility Matrix for Testing and Monitoring

The Site, managed by BP, will be supported by multiple contractors sharing project responsibilities, as categorized in this Plan, and shown on **Table 1**. This table will be updated with the names of relevant third parties once contractors are selected by BP.

Table 1. Responsibility Matrix for Sampling / Testing / Monitoring

Sampling / Testing / Monitoring Activity	Responsible Party
CO_2 Stream Analysis	BP and Third Party (To be determined)
Operational Parameters (i.e., injection pressure, rate, volume, temperature)	BP
Shallow Groundwater Sampling	Third Party (To be determined)
Intermediate Groundwater Sampling	Third Party (To be determined)
Mechanical Integrity Testing (MIT)	BP
Well Logging	Third Party (To be determined)
Geophysical Monitoring	Third Party (To be determined)

3.7 Quality Assurance Procedures [40 CFR 146.90(k)]

A Quality Assurance and Surveillance Plan (QASP) for all testing and monitoring activities, required pursuant to 146.90(k), is provided as **Attachment 1** to this Plan.

3.8 Reporting Procedures [40 CFR 146.91]

BP will report the results of testing and monitoring activities to the Underground Injection Control (UIC) Program Director in compliance with 40 CFR 146.91.

3.9 Data Retention [40 CFR 146.91(f)(2)(3)]

BP will retain the results of all testing and monitoring activities in accordance with the durational requirements of 40 CFR 146.91(f)(2) and 40 CFR 146.91(f)(3).

4 CO_2 STREAM ANALYSIS [40 CFR 146.90(a)]

BP will analyze the CO_2 stream during the injection period to yield data representative of its chemical and physical characteristics and to meet the requirements of 40 CFR 146.90(a). Sampling will take place both on a continuous and intermittent basis via online gas analysis and routine spot sampling, respectively. Sampling frequency is subject to further assessment and

approval from the UIC Program Director but is intended to occur quarterly at a minimum for the initial phases of Site operation.

BP will analyze the CO_2 for specific constituents utilizing detailed analytical methods as described on **Table 2** in this Plan.

4.1 Sampling Location and Frequency [40 CFR 146.82(a)(7)(iv)]

[redacted] This will allow for assessment of flow assurance and mechanical integrity in the CO_2 pipeline and the injection wells. [redacted]

Periodic routine spot sampling will be used as additional points of control. The sampling will occur prior to initial injection at the Site and quarterly, thereafter, at a minimum. Final determination of sampling frequency is subject to further assessment and approval from the UIC Program Director. The location of the routine spot sampling points is to be determined.

A significant change in chemical or physical characteristics of the CO_2 stream will trigger additional sampling to collect sufficient data to characterize the CO_2 stream.

The tolerance for the amount of impurities in the CO_2 stream is currently being assessed, and the documentation will be updated accordingly once the results are available.

The CO_2 streams are discussed further in the **Application Narrative.**

4.2 Analytical Parameters

BP will analyze the CO_2 stream for at least the constituents identified on **Table 2** using the methods listed. The specific analytical methods employed, and frequency of sampling (above the minimum), may vary based on the criticality to operations and the analyzers implemented for continuous monitoring. Formulas used for calculation of parameters and conversion factors will be provided by the equipment supplier and will comply with accepted industry standards for the specific equipment and be appropriately adjusted for the CO_2 stream and composition parameters. The UIC Program Director will be notified 30 days in advance of any changes to the **Table 2** analytical parameters.

[redacted]

4.3 Sampling Methods

The CO_2 stream sampling will be conducted [redacted] The samples will be collected and analyzed based on the requirements for each of the provided methods listed on **Table 2**. [redacted]

[redacted] The samples will have descriptive labels with identification numbers and sampling dates, as described in the QASP (**Attachment 1**).

4.4 Laboratory to Be Used/Chain of Custody and Analysis Procedures

An accredited third-party laboratory will be used to analyze samples and will adhere to standardized procedures for gas chromatography, mass spectrometry, detector tubes, and photo ionization. The accredited third-party laboratory is yet to be selected, and the name will be communicated once the contract is awarded. Detection limits are included on **Table A.7** (Summary of Analytical Parameters for CO_2 Stream), and the chain of custody procedures are described in **Section B.3.e** (Sample Chain-of-Custody) of the QASP (**Attachment 1**).

5 CONTINUOUS RECORDING OF OPERATIONAL PARAMETERS [40 CFR 146.88(e)(1), 146.89(b), and 146.90(b)]

In accordance with 40 CFR 146.88(e)(1), 40 CFR 146.89(b), and 40 CFR 146.90(b), BP will install and use continuous recording devices to monitor the operational parameters that are summarized in **Table 3.** Continuous monitoring of these parameters will begin with a baseline annulus pressure test on each injection and monitoring well. This will support the assessment of the mechanical integrity baseline, prior to CO_2 injection.

Continuous recording devices on the injection wells will monitor the injection pressure, rate, and allocated volume at the well head, along with the pressure and temperature on the annulus between the long-string casing, tubing, and annulus fluid volume added. The continuous monitoring is defined as uninterrupted monitoring for specific parameters, where values are extracted at certain intervals. These standard operational procedures are generally described below but may change over the injection period at the Site based on specific site conditions (e.g., in response to monitoring device failure or the availability of new technologies, data-gathering procedures, and/or methods). Data gathered through the monitoring program will be stored in BP-maintained databases for immediate review and timely reporting to the UIC Program Director.

5.1 Monitoring Location and Frequency

After the initial annulus pressure test, BP will perform the activities identified in **Table 3** to monitor the operational parameters listed in the table and verify the internal mechanical integrity of each injection well. The table also indicates the monitoring and measurement locations and frequency. All monitoring will occur continuously throughout the duration of the injection period. [redacted] If the CO_2 injection rate changes significantly, BP will adjust the monitoring frequency to demonstrate sufficient characterization of well construction materials.

[redacted]

5.2 Monitoring Details

Table 3 above describes where the measurement devices will be installed in the injection system network and specifies the choice of measurement equipment or instrumentation and the frequency of each measurement.

The calibration of the above-ground pressure and temperature instruments will be conducted annually using recognized industry standards in accordance with **Section B.7** (Instrument/Equipment Calibration and Frequency) of the QASP (**Attachment 1**). [redacted] The calibration of the flow meter will be done in accordance with the recognized industry standards, covering the range of

expected rates. [redacted]

If any measurement devices experience failure, alternative data gathering procedures and methods may be used. Data acquired by the testing and monitoring procedures will be stored in a variety of locations, including third-party servers, BP servers, and cloud-based storage, and will be provided timely to the UIC Program Director as required or requested. [redacted]

Mechanical integrity will be monitored as part of the pressure and temperature monitoring procedure described in further detail in **Section 9** (External Mechanical Integrity Testing). A significant change from the baseline or initial conditions in parameters measured by direct or indirect monitoring could indicate a loss of mechanical integrity. If mechanical integrity is lost, BP will follow the procedures outlined in the ERRP (**Appendix H**).

5.2.1 Injection Rate and Pressure Monitoring

[redacted] The anticipated maximum wellhead pressure for each well will be recalculated based on actual operating conditions. The maximum wellhead pressure limit is keyed off the design operating limits of each well and surface limitations. The pressure is not tied to a specific injection rate as this rate may change over the injection period of the Site. The maximum downhole injection pressure will not exceed 90% of the injection zone's fracture pressure. [redacted]

5.2.2 Calculation of Injection Volumes

[redacted] Flow rate is measured on a mass basis (kilogram per hour). The downhole pressure and temperature data will be used to perform the injectate density calculation.

5.2.3 Continuous Monitoring of Annular Pressure

BP will implement the following procedures to limit the potential for fluid movement into or out of the annulus:

[redacted]

Any material changes to the composition of annular fluid will be reported to the UIC Program Director in the next regular report. Average annular pressure and annulus tank fluid level will be recorded daily. The volume of fluid added or removed from the system will be recorded.

6 CORROSION MONITORING [40 CFR 146.90(c)]

To meet the requirements of 40 CFR 146.90(c), BP will conduct corrosion monitoring activities of well materials designed to monitor the integrity of the injection wells throughout the operational period. BP will monitor well materials during the operation period for loss of thickness, mass, cracking, pitting, and other signs of corrosion to ensure that the well components meet the minimum standards for material strength and performance.

In accordance with 40 CFR 146.90(c)(1), BP will monitor corrosion using the corrosion coupon method and collect samples according to the description below. Coupons provide a direct measurement of material lost to corrosion.

6.1 Monitoring Frequency

Baseline assessment for corrosion coupon samples will be completed after receiving the authorization to inject. Corrosion monitoring will occur quarterly, beginning three months after the date of injection authorization, for the duration of injection.

6.2 Sampling and Monitoring Details

The corrosion monitoring program will use conventional corrosion coupon analysis. As noted on **Table 4**, the coupons will reflect the materials of construction for the equipment that will be

exposed to the CO_2 stream. [redacted] These coupons will be removed every quarter, cleaned, and reweighed. The samples will be visually inspected under magnification for loss of mass, thickness, cracking, pitting, or other signs of corrosion. The corrosion monitoring program will be maintained and modified as needed to meet the requirements of 40 CFR 146.90(c).

[redacted]

In accordance with 40 CFR 146.90(c), a corrosion monitoring system will be constructed downstream of all process equipment, including the compression, dehydration, and pumping equipment, at a location in close proximity to the wellhead. [redacted]

The coupons will be analyzed to document changes in dimensions, height, and appearance. Rates and trends of corrosion will be evaluated for each coupon. Each test will be performed to a minimum dimension standard of 10 times power, dimensionally measured to the third significant figure, and weighed to the fifth significant figure. When more significant figures are available on the measuring instruments, these will be recorded. The weight will be used to calculate the corrosion rate in mils/year (mils/yr), where a mil is equal to a thousandth of an inch. If the coupons are found to have more than 3 mils/yr of loss, corrective action will be taken.

The ASTM International G1-03 2017 standard for Prepping, Cleaning, and Evaluating Corrosion Test Specimens will be used to demonstrate that the methods used above are an accurate representation of downhole conditions.

7 SURFACE AIR MONITORING OR SOIL GAS MONITORING [40 CFR 146.90(h)]

If surface air monitoring and/or soil gas monitoring is required by the UIC Program Director under 40 CFR 146.90(h), this Plan will be updated.

8 ABOVE CONFINING ZONE MONITORING [40 CFR 146.90(d)]

In accordance with 40 CFR 146.90(d), BP will monitor groundwater quality and geochemical changes above the confining zone during the operation period.

8.1 Monitoring Location and Frequency

The depth of the USDW is based on log data acquired from the Nonagon #1 appraisal well and subregional USDW analysis described in **Section 5** (AoR Delineation) of the AoR and Corrective Action Plan (**Appendix B**). [redacted]

[redacted]

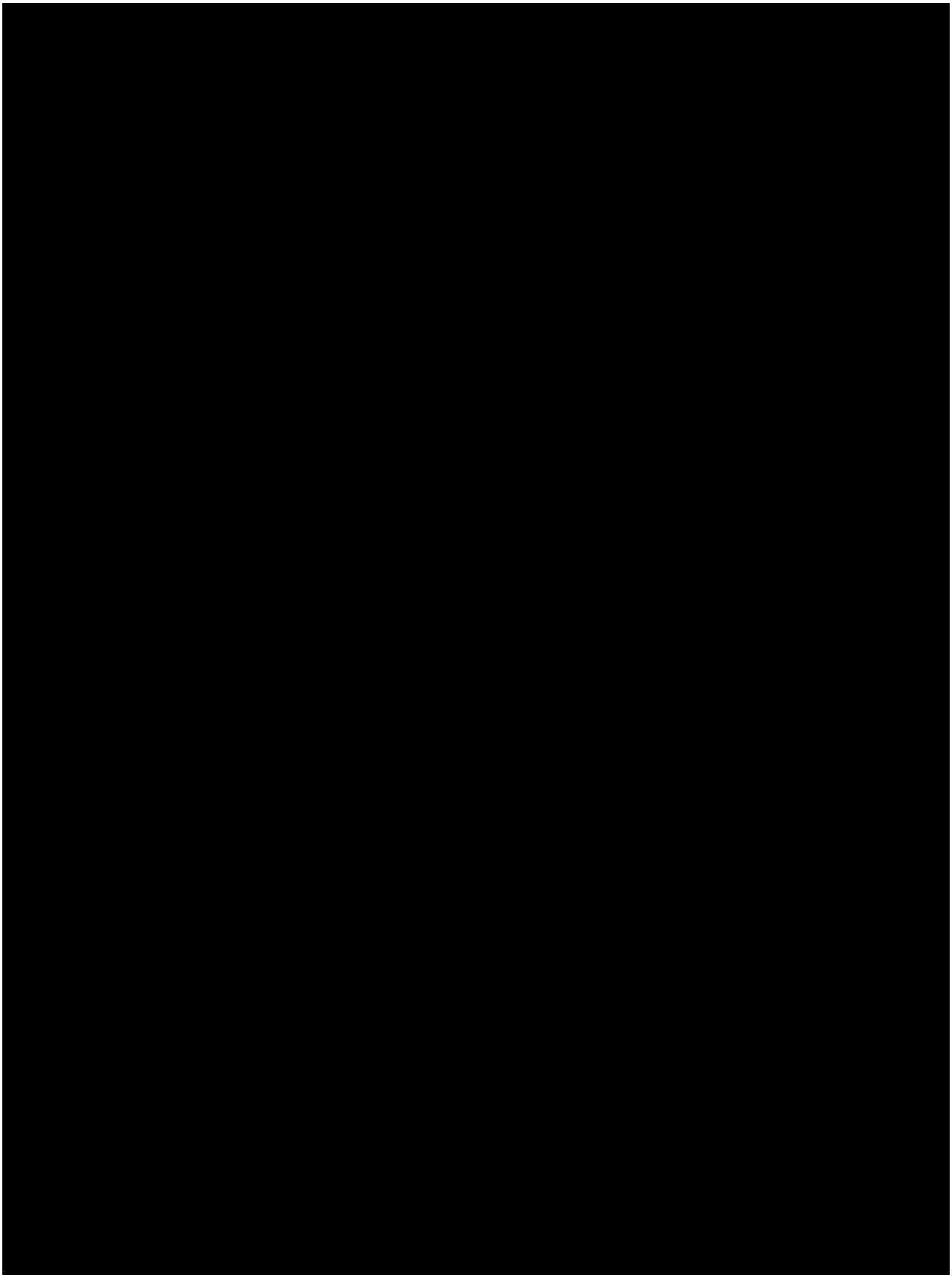
- Legacy Wells
- Artificial Penetrations Within the Injection Zone

[redacted]

[redacted] **Figure 1** below shows the location of the planned above confining zone monitoring wells relative to the maximum extent of the CO_2 plume and AoR critical pressure front. [redacted]

[redacted]

Monitoring methodologies and monitoring locations are detailed on **Table 5** below. Because groundwater pressures in monitored zones are expected to be relatively stable, variations from initial condition pressures identified through sampling and analysis may provide an indicator of potential leakage from the injection zone. Pressure and temperature will be monitored continuously to identify indicators of potential leakage from the injection zone.



Initial conditions for the parameters described below in **Section 8.2** will be developed prior to injection at the Site. The initial conditions will be utilized to compare and track changes in the monitored data. As described in the ERRP **(Appendix H**), if significant abnormalities are identified compared to the initial condition data, additional sampling may be warranted.

Table 5 shows the planned monitoring methods, locations, and frequencies for groundwater quality and geochemical monitoring above the confining zone. Continuous monitoring is uninterrupted monitoring where values are extracted at specific pre-defined intervals to meet project requirements.

8.2 Analytical parameters

Table 6 identifies the parameters to be monitored and the analytical methods BP will use. Monitoring data will be continuously evaluated throughout injection and specific parameters will be changed in response to site conditions.

As noted in the previous section, initial conditions data will be gathered prior to injection. Groundwater sampling will be compared to the initial conditions data to identify significant changes in the characteristics that may indicate migration of CO_2. [redacted]

[redacted]

[redacted]

8.3 Sampling Methods

Per 40 CFR 146.90(k), the QASP (**Attachment** 1) describes the testing and monitoring methods conducted for this Site. The monitoring strategy is described in **Section B.1** (Sampling Process Design) of the QASP, and the groundwater sampling methods to be employed, including sampling standard operating procedures and sample preservation are described in **Sections B.2.a/b** (Sampling Standard Operating Procedures) **and B.2.g** (Sample Preservation), respectively.

8.4 Laboratory to Be Used/Chain of Custody Procedures

An accredited third-party laboratory will be used to analyze samples and will adhere to standardized procedures for gas chromatography, mass spectrometry, detector tubes, and photo ionization. Once a third-party laboratory is chosen, this section will be updated with the laboratory's name. Detection limits are included on **Table A.6** (Summary of Analytical Field Parameters for Groundwater Samples Above the Confining Zone), and chain of custody procedures are described in **Section B.3.e** (Sample Chain-of-Custody) of the QASP (**Attachment 1**).

9 EXTERNAL MECHANICAL INTEGRITY TESTING [40 CFR 146.89(c), 40 CFR 146.90(e)]

Annually until the injection well is plugged, BP will conduct at least one of the tests presented on **Table 7** as part of external Mechanical Integrity Testing (MIT) required by 40 CFR 146.89(c) and 40 CFR 146.90(e).

9.1 Testing Location and Frequency

External MITs will be completed to demonstrate the external mechanical integrity of the injection wells. At least one of the tests on **Table 7** will be completed annually until the injection well is plugged, prior to the anniversary date of authorization of injection. External MITs may also be completed on monitoring wells if routine testing data indicates potential issues with the integrity of a monitoring well.

Table 7. Mechanical Integrity Testing

Test Description	Location
Temperature Log	Along wellbore using DTS or wireline well log
Noise Log	Wireline Well Log
Oxygen Activation Log	Wireline Well Log

Test Description	Location
[redacted]	

Notes: DTS – distributed temperature sensing

9.2 Testing Details – Description of MITs That May Be Employed

The following general procedures will be followed for the logs listed on **Table 7**:

- Move in and rig up wireline logging unit.
- Assemble the temperature log oxygen activation log or noise logging tool.
- Rig up wireline pressure control equipment and test for leaks.
- Run in the hole with tools to plug back total depth and log to surface per industry cased-hole standards.
- Recover tools and rig down.
- Interpret log results.
- Prepare report in accordance with 40 CFR 146.91(b)(1).

Additional procedures specific to each MIT are further described below.

9.2.1 Temperature Logging Using Wireline

Temperature log data will be recorded across each injection wellbore from confining caprock to surface. These temperature data will be used to ensure mechanical integrity of the casing of the injection wells. The following procedures will be implemented for temperature logging, in addition to the general procedures described in **Section 9.2** above:

1. Ensure that the well is in a state of injection for sufficient time to set the baseline temperature.
2. Conduct temperature logging from the confining caprock to surface according to industry-accepted procedures.
3. Compare the two injection temperature profiles. Any anomalies could indicate failure of well integrity.

A baseline temperature survey will be conducted prior to injection. Intermediate and final temperature survey(s) will follow injection. Leakage of fluids out of the injection well will be an anomaly in the otherwise linear temperature log, as the temperature within the surrounding formation will be heated or cooled based on the differential from the leaking fluid. Logs will be compared to the baseline log taken prior to injection.

Standard temperature logging tools are capable of detecting very small changes in temperature. However, the accuracy and precision of the logging tool is dependent on the movement of the tool within the well casing during the logging process. The tool must be moved slowly in order to obtain accurate measurements, and in order for the results to be reproducible, the movement speed must be consistent as well.

9.2.2 Temperature Logging Using DTS Fiber Optic Line

The distributed temperature sensing (DTS) line can be used for real-time temperature monitoring, and similar to a conventional temperature log, it can allow for early detection of temperature changes that may indicate a loss of well mechanical integrity. [redacted]

Temperature logging will be completed according to industry-accepted procedures. In addition to the general procedures described in **Section 9.2** above, the procedures for using DTS for well mechanical integrity are as follows:

1. Establish a baseline temperature after the well is completed and prior to injection. The baseline is representative of the natural temperature gradient for the formation zone.
2. Record the temperature during injection operations prior to shutting in the well.
3. Stop injection operations and record temperature profile. Use recorded temperature to determine if additional cooling time is needed for the interpretation based on evaluation of data.
4. Begin injection and record temperatures for shut-in.
5. Compare the temperature profile along the tubing when the well cools down to the baseline temperature profile.

9.2.3 Noise Logging

Noise logging data will be recorded across the wellbore from surface down to primary caprock according to an industry-accepted procedure to ensure the mechanical integrity of the casing of each injection well. Noise logging will be carried out while injection is occurring.

9.2.4 Oxygen Activation Logging

Oxygen activation (OA) log data will be recorded across the wellbore from confining caprock to surface according to industry-accepted procedures. This logging data will be used to ensure mechanical integrity of the casing of the injection wells. This log will be performed while injection is ongoing.

[redacted]

10 PRESSURE FALL-OFF TESTING [40 CFR 146.90(f)]

BP will perform pressure fall-off tests during injection as described below to meet the requirements of 40 CFR 146.90(f).

10.1 Testing Location and Frequency

Pressure fall-off testing will be performed:

1. During injection, at least once every five years;
2. Potentially at other stages during routine or required well maintenance periods; and
3. At the end of the injection period.

In accordance with 40 CFR 146.91(b)(3), results of the fall-off tests will be submitted to the UIC Program Director.

10.2 Testing Details

In addition to the general procedures described in **Section 9.2** above, BP will conduct the pressure fall-off testing as described below:

1. The pressure fall-off test period will have an injection period followed by a period of no-injection (or shut-in).
2. The standard stream of captured CO_2 will be used during the injection period preceding the shut-in portion of the fall-off tests.
3. The injection rate will be held constant prior to the fall-off test. If this rate causes relatively large changes in bottomhole pressure, the rate may be decreased.
4. BP will ensure there is at least a minimum of one week of relatively continuous injection preceding the shut-in portion of the fall-off test. This data will be measured using a surface readout downhole gauge so a final decision on test duration can be made after the data is analyzed for average pressure.
5. The well should be simultaneously shut in at the wellhead and at the injection compression facility. This will help reduce the wellbore storage effects to the pipeline and surface equipment.
6. Data will be collected at intervals appropriate to the stage of the test to help eliminate downhole recording memory restrictions.
7. The shut-in period of the fall-off test will be of adequate length to collect enough pressure transient data to assess current well status. The shut-in duration can be determined in real-time, as surface readout gauges will be utilized.
8. A report containing the pressure fall-off data will be submitted to the permitting agency within 30 days of the completion of the test.
9. Pressure sensors used for this test will be the wellhead sensors and a downhole gauge for the pressure fall-off test.
10. Each gauge will be of a type that meets or exceeds ASME B 40.1. The wellhead pressure gauge range will be 0 – 5,000 psi. The downhole gauge range will be 0 – 10,000 psi.

11 CO_2 PLUME AND PRESSURE FRONT TRACKING [40 CFR 146.90(g)]

BP will employ direct and indirect methods to track the extent of the CO_2 plume and the presence or absence of elevated pressure during injection to meet the requirements of 40 CFR 146.90(g). BP intends to supplement this plan with additional data from the Nonagon #1 appraisal well, dynamic simulation model, geologic site characteristics, and other relevant information sources.

11.1 Plume Monitoring Location and Frequency

[redacted]

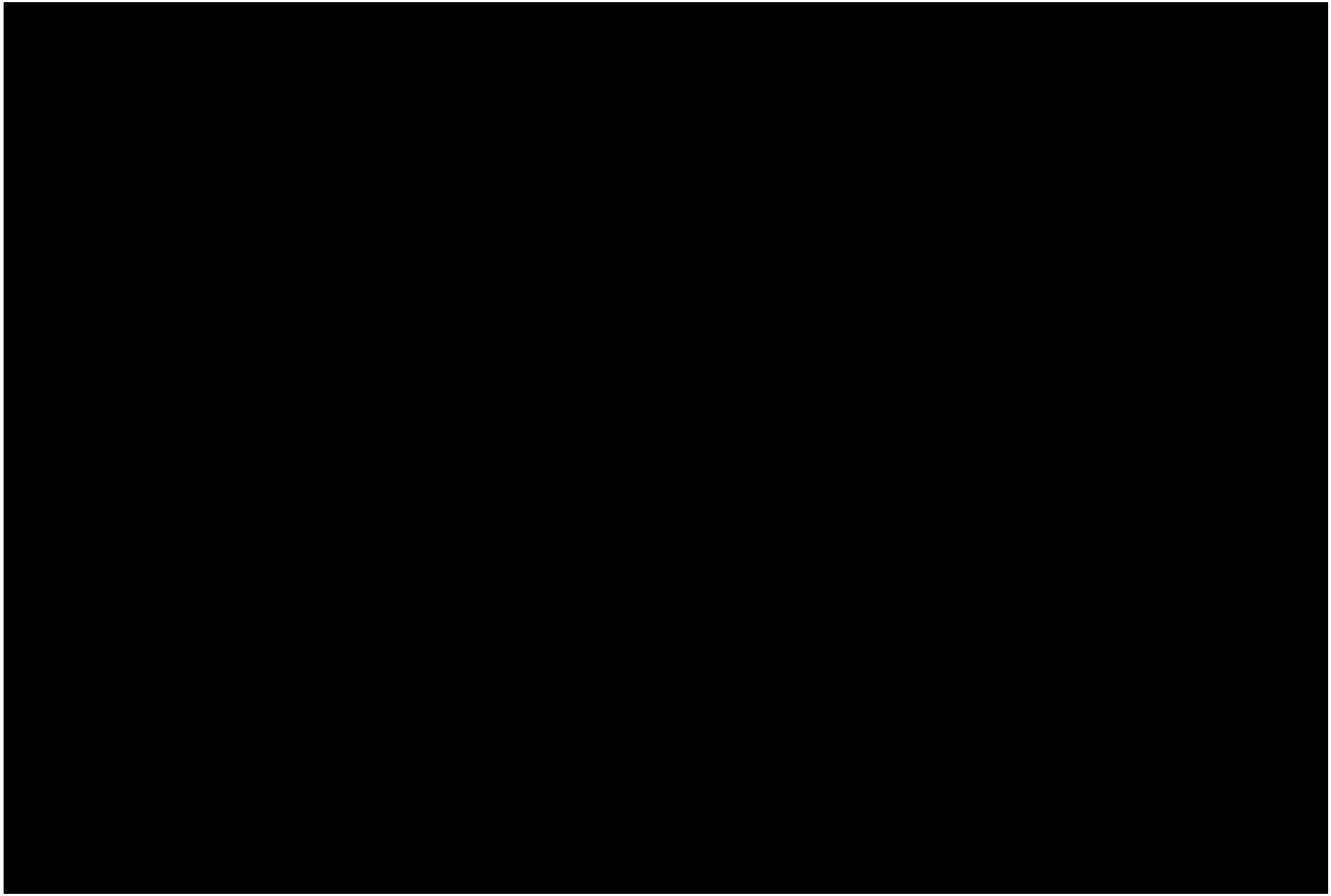
These data, if developed, will be used to further calibrate and refine the modeling. The frequency of monitoring for all geophysical techniques will be based upon desktop analysis.

[redacted]

11.2 Plume Monitoring Details

Monitoring locations relative to the predicted location of the CO_2 plume and pressure front at one-year intervals through the first five years of injection are shown in **Figure 2** below. See the Area of Review and Corrective Action Plan (**Appendix B**) sections titled "Critical Pressure Calculations" and "AoR Delineation" for the derivation of P_{crit} and AoR. [redacted]

[redacted]



Section 7 (Reevaluation Schedule and Criteria) in the Area of Review and Corrective Action Plan (**Appendix B**) further explains how CO_2 plume monitoring data and analysis will be used to history-match modeled results and update model predictions to support BP's demonstration of non-endangerment of USDWs.

Table 8 describes potential indirect methods that BP may use to further investigate the position of the CO_2 plume. BP has not yet determined which indirect method(s) will be most appropriate for the Site. Quality assurance procedures for these potentials method(s) are included in the QASP (**Attachment 1**).

[redacted]

11.3 Pressure-Front Monitoring Location and Frequency

[redacted] (**Table 9**). Monitoring locations relative to the predicted location of the CO_2 plume and pressure at 1-year intervals through the first seven years of injection are shown on **Figure 2** above. As part of an adaptive monitoring strategy, pressure monitoring may be deployed in additional in-zone monitoring wells but placed at a distance that is farther from injection wells, if and when such monitoring is deemed necessary.

[redacted] (**Table 9**). [redacted]

11.4 Pressure-Front Monitoring Details

[redacted] See **Section 7** (Reevaluation Schedule and Criteria) in the Area of Review and Corrective Action Plan (**Appendix B**) for how pressure monitoring data and analysis will be used to history-match modeled results and update forward model predictions to support the non-endangerment demonstration.

Table 9 presents the methods that BP will use to monitor the position of the pressure front, including the activities, locations, and frequencies. A frequency that is continuous refers to uninterrupted monitoring where values are extracted at specific pre-defined intervals to meet project requirements. Quality assurance procedures for these methods are presented in the QASP (**Attachment 1**).

12 PERIODIC REVIEW OF TESTING AND MONITORING PLAN [40 CFR 146.90(j)]

At a frequency of no less than once every five years, BP will periodically review this Plan in accordance with 40 CFR 146.90(j). The review will incorporate monitoring data, operational data, and the most recent AoR reevaluation performed under 40 CFR 146.84(e).

As required by 40 CFR 146.90(j)(1), based on the review described in the preceding paragraph, BP will submit to the UIC Program Director an amended Plan or a demonstration that no amendment to the Plan is needed within one year of an AoR reevaluation. Circumstances that could cause a more frequent review include significant changes to the Site or the request of the UIC Program Director.

BP understands that any amendments to this 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 40 CFR 144.41, as appropriate.

ATTACHMENT 1
QUALITY ASSURANCE AND SURVEILLANCE PLAN