ATTACHMENT 5: PRE-OPERATIONAL FORMATION TESTING PROGRAM
40 CFR 146.82(a)(8), 146.87

HOOSIER #1 PROJECT

Facility Information

Project Name: Hoosier #1

Facility Name: Cardinal Ethanol

Facility Contact: Jeremey Herlyn, Project Manager
Cardinal Ethanol

Well Location: 1554 N. 600 E.
Union City, IN 47390
CO_2 Injection Well Location for Cardinal CCS1
Latitude 40.186587°
Longitude -84.864284°

Operator Name: One Carbon Partnership, LP
1554 N. 600 E.
Union City, IN 47390

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List of Acronyms

ACZ	Above Confining Zone
APT	Annular Pressure Test
BGS	Below Ground Surface
BHA	Bottomhole Assembly
CBL-VDL	Cement Bond Log-Variable Density Log
DST	Drill Stem Test
ECS	Elemental Capture Spectroscopy
EPA	Environmental Protection Agency
FOT	Fall-off Test
MIT	Mechanical Integrity Test
MWD	Measurement While Drilling
NMR	Nuclear Magnetic Resonance
OAL	Oxygen Activation Logging
PVC	Polyvinyl Chloride
RAT	Radioactive Tracer Logging
SRT	Step-rate Testing
TD	Total Depth
TDS	Total Dissolved Solids
UIC	Underground Injection Control
USDW	Underground Source of Drinking Water
USDW1	Lowermost USDW Monitoring Well
ZVSP	Zero Offset Vertical Seismic Profile

1 Introduction

This document serves to detail the proposed Pre-Operational Formation Testing Program to be implemented to characterize the chemical and physical features of the lithology at Project Hoosier #1. The formations of note include, but are not limited to, the following:

- Mt. Simon Sandstone (injection zone),
- Eau Claire Formation (confining zone),
- Maquoketa Formation (which includes the lowest underground source of drinking water [USDW]), and
- Above confining zone (ACZ) intervals.

The Pre-Operational Testing Program laid out in this document is designed to meet the testing requirements of Title 40 of the U.S. Code of Federal Regulations Section 146.87 (40 CFR 146.87) and well construction requirements of 40 CFR 146.86. It includes a combination of logging, coring, fluid sampling, and formation hydrogeologic testing that will be completed during the drilling of the:

- USDW1: Deepest USDW monitoring well
- CCS1: CO_2 injection well,
- OBS1: Injection zone monitoring well
- ACZ1: Above confining zone monitoring well

Should the necessary data fail to be collected in the first three wells, the ACZ1well will be used to collect missing overburden data. As a result of the scarcity of well data below the Trenton Formation, the final ACZ monitoring interval will be determined after the first deep well has been drilled for the project. Based on regional knowledge, it is expected that a suitable monitoring interval will be found at or immediately above the Knox Formation unconformity due to the Glenwood Formation's properties that create an effective barrier to fluid migration as observed to the east in Ohio.

Current plans are to drill the CCS1 in September 2023, pending receipt of an initial project permit. Following the drilling, completion, and testing of the well, a permit modification will be submitted to provide updated information regarding the results of the testing program.

The Pre-Operational Testing Program will determine and verify the depth, thickness, mineralogy, lithology, porosity, permeability, and geomechanical information of the injection zone, confining zone, and other relevant geologic formations (Figure 1 and Figure 2) via petrophysical logging and analysis, and coring. In addition, formation fluid characteristics will be obtained from the injection zone, USDW, ACZs to establish accurate baseline data against which future measurements may be compared after the start of injection operations.

Figure 1: Site map of Cardinal wells

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Figure 2: B-B' Cross Section through the Cardinal wells. TD of each well is indicated on the figure.

2 USDW1 Well Hydrogeologic Characteristics (146.87 (e))

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3 CCS1 Injection and OBS1 Observation Well Pre-Operational Formation Testing Program (146.87 (a))

CCS1 will serve as the CO_2 injection well and OBS1 will serve as the deep monitoring well. As such, a rigorous Pre-Operational Testing Program will be performed to:

- Collect important site characterization data such as, but not limited to, wireline logs, core, and fluid samples,
- Ensure the well will not serve as an upward conduit for CO_2 migration to the overlying USDWs.

The well construction plan is presented in (Attachment 4: Well Construction, 2022). This section describes the Pre-Operational Testing Program that will be completed during the drilling and completion of CCS1. Should OBS1 be drilled prior to CCS1, similar methodologies will be used to collect data for characterization. The second well will present an additional opportunity to collect data should the following occur:

- The project is unable to collect a particular dataset in the first well,
- A dataset is collected but is not useable. (i.e., damaged core).

It has not currently been determined whether OBS1 will be drilled before, or after CCS1. Clarity as to the order of operations will be provided once a more detailed installation procedure is finalized.

3.1 Deviation Surveys (146.87 (a)(1))

Deviation surveys will be obtained as Cardinal CCS1 and OBS1 are drilled to determine the wellbore path from the surface to the total depth of the wells. It is currently planned that this will be done by running a survey tool in on wireline to measure the inclination. The tool has an electronic timer that is set at the surface to allow enough time to run the tool in the drill pipe to the desired depth. Following the set time, the tool is removed from the well. The result of the survey will then be reviewed prior to continuation of drilling

An alternative way to measure these deviation surveys is done by placing a measurement while drilling (MWD) tool, used to take well path surveys, on the bottomhole assembly (BHA) just above the drill bit. This tool records the inclination (deviation) and azimuth (direction), and then transmits this information to surface in real-time.

Hole deviation will be maintained at less than five degrees, as the planned maximum allowable deviation in the well is 5 degrees. If necessary, the wellbore will be steered back to acceptable deviation with directional tools, with a downhole motor or rotary steerable system added to the BHA. Surveys will be taken at the frequency shown in Table 1Table 1. In general, a survey will be performed every 300 ft during the drilling of the borehole unless deviation of the borehole becomes apparent.

Should the deviation increase, more frequent surveys will be performed, and remedial actions will occur as necessary to bring the well within specification. More frequent surveys will also be performed while drilling through zones that are likely to cause the bit to “walk” creating a greater risk for deviation.

Table 1: CCS1 and OBS1 Deviation survey frequencies to be taken.

Range of Deviation	Frequency of Survey
<1 degree	1 survey per every 300 ft. of hole
>1 degree, but < 2 degrees	1 survey per every 240 ft. of hole
>2 degrees, but < 3 degrees	1 survey per every 120 ft. of hole
>3 degrees, but < 4 degrees	1 survey per every 90 ft. of hole
>4 degrees, but <5 degrees	1 survey per every 30 ft. of hole

3.2 Well Logging: Before and After Surface Casing (146.87 (a)(2))

Table 2 summarizes the open and cased hole well logs that will be acquired before for the surface casing section of the well. Sensitive, Confidential, or Privileged Information [redacted].

Table 2: CCS1 and OBS1 summary of wireline logs and associated parameters of logging tools to be run before and after surface casing is set (surface to between 450– 560 ft).

Open/ Cased Hole	Log Type	Parameters Obtained	CCS1	OBS1
Open Hole (Required)	Gamma Ray	Lithology	X	
	Spontaneous Potential	Permeability	X	
	Resistivity	Fluid saturation, permeability	X	
	Caliper	Borehole diameter, stress	X	
Surface Casing Will Be Installed and Cemented				
Cased Hole (Required)	CBL – with radial arms	Surface casing cement integrity, external mechanical integrity	X	X
	Temperature	Temperature, external mechanical integrity	X	X
Cased Hole (Optional)	Ultrasonic Cement Evaluation	Cement integrity, external mechanical integrity	X	X

3.3 Well Logging: Deep Section (146.87 (a)(2))

Table 3 and Figure 3 summarize the well logs that will be run before and after long string casing is set and the purpose of each well log. The cased hole well logs will be acquired after the well is cemented and completed (Table 3). The well logs that are acquired to characterize the injection zone and confining zone will be run in the first deep well drilled for the project. A minimal logging suite will be acquired in the second deep well to correlate to the data acquired in the first well.

In addition to the well logs listed in Table 3, the project may run other specialty well logs over the injection zone and confining interval in order to further characterize these formations. Specialty logs may include, but are not limited to, elemental capture spectroscopy

(ECS), nuclear magnetic resonance (NMR), dipole sonic in multiple modes, or zero offset vertical seismic profiles (ZVSP).

Table 3: CCS1 and OBS1 summary of wireline logs and associated parameters of logging tools to be run before and after long string casing (surface to TD).

Log	Log Type	Parameters Obtained	CCS1	OBS1
Open Hole Logging (Required)	Gamma Ray	Lithology	X	
	Density	Porosity, density	X	
	Neutron Porosity	Porosity	X	
	Spontaneous Potential	Permeability	X	
	Resistivity	Fluid saturation, permeability	X	
	Caliper	Borehole diameter, stress	X	
	Image Log	Lithology, porosity, borehole diameter, fracture characterization, stress	X	
Special Open Hole Logging (Optional)	Sonic Log	Porosity, formation velocities	X	
Long string casing will be installed and cemented				
Cased Hole Logging (Required)	CBL with radial arms	Cement integrity, external mechanical integrity	X	X
	Temperature	Temperature, external mechanical integrity	X	X
Cased Hole Logging (Optional)	Ultrasonic Cement Evaluation	Cement integrity, external mechanical integrity	X	X
	Pulsed Neutron	Lithology, baseline fluid saturation, porosity	X	X

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Figure 3: CCS1 Summary of wireline logs and associated parameters of logging tools to be run before and after surface casing (surface to TD).

3.4 CCS1 and OBS1 Injection Well Core Program (146.87 (b)(d))

Once the first deep well for the project has been drilled, the well logs will be analyzed and used to pick the optimal intervals to obtain core from the confining zone and the injection zone in the second well drilled for the project (Figure 4). Approximately 50 ft of core will be acquired in both the Eau Claire Shale and the Mt. Simon Sandstone. Figure 4 and Table 5 summarize the plans for whole core acquisition and testing from the second deep well.

Table 4: Whole core collection plan. Whole core plugs will be taken from the whole core at regular intervals. Sidewall core collection will be contingent on the results of the well logging and the success of the whole core acquisition.

Core Type	Target Interval MD (ft)	Formation	Core Size
Whole Core	Sensitive, Confidential, or Privileged Information [redacted]		
Whole Core			
Sidewall Core			

Sidewall core intervals will be selected as contingency should the project be unable to obtain the desired whole core intervals. Using well logs, a neural network will be run to determine the heterogeneous rock types. This will be used to determine the sidewall core locations and to fill any gaps in the whole core program. Sidewall cores collected will provide a comprehensive set of routine rock property data for calibrating geophysical wireline logs and to supplement formation property data where whole core data are not available.

Additional core will be collected if:

- Interpretation of the characterization well data indicates that additional data are needed to meet Class VI permit requirements.
- As required by the Director.

Once the whole core is collected, preserved, and transported to a core lab, the following will be completed:

1. The core will be slabbed.
2. High resolution core photography will be completed.
3. Core viewing and core descriptions will be completed by project geologists.
4. Using well logs, a neural network will be run to determine the heterogeneous rock types.
5. To best capture the heterogeneity present in the core, the core viewing and heterogeneous rock type analysis will be used to select whole core plug locations.
6. Whole core plugs will be taken from the whole core at regular intervals.
7. Core analysis will be completed. Core testing will provide information on rock properties (e.g., porosity, permeability, petrology, and mineralogy) that are representative of the injection and confining zones near the injection well. Table 5 contains details of the planned laboratory testing for the whole core sections.

8. The details in Table 5 are a preliminary plan only and are expected to change once site-specific data is acquired. Core plugs, sidewall plugs, and core analysis will be adjusted based on the drilling and log data that is acquired.

If sidewall core is collected, preserved, and transported to a core lab, the following will be completed.

1. High resolution core photography will be completed.
2. Core viewing and core descriptions will be completed by project geologists.
3. Core analysis will be completed. Core testing will provide information on rock properties (e.g., porosity, permeability, petrology, and mineralogy) that are representative of the injection and confining zones near the injection well.

Core samples from the second deep well will provide information on geologic properties in the immediate area. The laboratory-derived core measurements will be integrated with wireline logs and used for petrophysical calibration. The integrated dataset will then be correlated with wireline logs from offset wells to support the correlation and confirmation of stratigraphy, rock properties, and site characterization.

Formal core plans and numbers of cores to be utilized for each analysis listed in Table 5 will be provided once they are finalized with a coring contractor prior to well installation.

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Figure 4: Preliminary whole core collection plan

Table 5: Summary of potential core analyses and associated parameters

Core Analysis Type	Parameters Obtained	Formations
Routine Core Analysis	Porosity, Permeability, Grain Density	Mt. Simon Sandstone Eau Claire Shale Intervals TBD
Tight Rock Analysis	Porosity, Permeability, Grain Density	Eau Claire Shale Intervals TBD
Thin-Section Petrography	Mineralogy, Lithology, Porosity, Grain size, Textural maturity, Oil Staining	Mt. Simon Sandstone Eau Claire Shale Intervals TBD
X-Ray Diffraction	Mineralogy, clay identification	Mt. Simon Sandstone Eau Claire Shale Intervals TBD
Core Gamma Ray Log	Lithology, Porosity, Grain Size, Geologic Contacts	Both Whole Core Intervals
Relative Permeability	Relative permeability, Wettability	Mt. Simon Sandstone Intervals TBD
Mercury Injection Capillary Pressure	Capillary Pressure	Mt. Simon Sandstone Eau Claire Shale Intervals TBD
Triaxial Tests	Rock Strength, Ductility, Poisson's Ratio, Young's Modulus	Mt. Simon Sandstone Eau Claire Shale Intervals TBD
Rock Compressibility	Rock Compressibility	Mt. Simon Sandstone Eau Claire Shale Intervals TBD

3.5 CCS1 Injection Well: Fluid Sampling and Analysis (146.87 (b – d))

Characterization of formation fluids will be based on analysis of fluid samples acquired from USDW1, CCS1, and ACZ1. These samples will be collected through swabbing, drill stem tests (DSTs), or downhole pumps and will provide information on the baseline geochemistry of the subsurface fluids. The sampled formations will include, but are not limited to, the injection formation, the first ACZ monitoring interval above confining zone, and the lowermost USDW.

All fluid samples will be analyzed for TDS, other major analytes, and stable isotopes. This list of analytes as well as their detection limits is provided in Table 6.

Table 6. Summary of analytical and field parameters for groundwater samples

Parameters	Analytical Methods[1]
Cations: Al, Ba, Mn, As, Cd, Cr, Cu, Pb, Sb, Se, Zn, Ti Ca, Fe, K, Mg, Na, and Si	 ICP[2]-MS[3], EPA Method 6020 ICP-OES[4], EPA Method 6010B
Anions: Br, Cl, F, NO_3, and SO_4	 Ion Chromatography EPA Method 300.0
Dissolved CO_2	Coulometric Titration ASTM D513-11
Stable Isotopes of δ13C Dissolved Inorganic Carbon (DIC)	Isotope Ratio Mass Spectrometry[5]
Total Dissolved Solids (TDS)	Gravimetry APHA 2540C
Water Density (field)	Oscillating Body Method
Alkalinity	APHA 2320B
pH (field)	EPA 150.1
Conductivity/Resistivity (field)	APHA 2510
Temperature (field)	Thermocouple

Note 1: An equivalent method may be employed with the prior approval of the UIC Program Director.

Note 2: Inductivity Coupled Plasma

Note 3: Mass Spectrometry

Note 4: Optical Emission Spectrometry

Note 5: Gas evolution technique by Atekwana and Krishnamurthy (1998), with modifications made by Hackley et al. (2007)

3.6 Geomechanical Testing (146.87 (d))

The geomechanical characterization of the injection and confining zones for the project will be assessed by analyzing one or more of the following data sets: core analyses, log data, and in-situ field tests. These analyses may include, but are not limited to, triaxial compressive strength tests of core samples, dipole sonic and image logs, and step rate testing (SRT). The results of these analyses will provide information on the direction and magnitude of the three principal components of the stress field as well as the fracture gradient. Additional geomechanical data may be collected from OBS1 if problems are encountered with data acquisition in CCS1.

An SRT will be performed on the Mt. Simon Sandstone interval to determine the following information:

- Fracture opening pressure (to determine the fracture gradient)
- Fracture propagation pressure
- Fracture closure pressure.

This will be done by analyzing the pressure response to increasing rates. Injection at each of these rates will be performed on CCS1for the same period as the high-level procedure below.

A formal procedure will be provided to the EPA prior to the running of the SRT.

1. Record static pressure and temperature for a minimum of one hour.
2. Rig-up pump truck, ensure sufficient volume of fluid is present at location to begin testing.
3. Pressure test lines above maximum anticipated operating pressure, but below equipment rating.
4. Begin SRT.
    a. Pump first step of test at first desired rate (ex: 0.5 bpm) for a defined time (ex: 0.5 hours)
    b. After the first step is completed, increase rate to next step (ex: 1.0 bpm) for the same defined step time (0.5 hours).
    c. Repeat until the end of the test.
5. Shut-in well at the wing valves(s). Record the time of shut-in, the rate prior to shut-in and the shut-in pressure.
6. Rig-down pump truck.
7. Monitor pressure falloff for minimum of 24-hours.

The data from this test will be analyzed using appropriate analysis software, and the results will be included in the post installation reporting. Gauge calibration records will be provided at this time as well.

3.6.1 Pressure Fall-off Testing

A pressure fall-off test (FOT) will be run on CCS1 following the completion of the SRT. The purpose of this test is to further characterize the injection zone. During this test, fluid will be injected at a constant rate for a predetermined length of time, after which the well is shut in, and the FOT monitored for an equal amount of time as the injection lasted.

The data from this test will be evaluated using rate superposition analysis to determine reservoir information such as: permeability, skin factor (damage), and flow regimes present. This test analysis will act as a “baseline” measure to determine the change in overall effectiveness and injectivity of the injection zone over time, among other things. A high-level procedure is provided below. Note that a formal procedure will be provided to the EPA prior to the running of the FOT.

1. Record static pressure and temperature for a minimum of one hour.
2. Rig-up pump truck, ensure sufficient volume of fluid is present at location to begin testing.
3. Begin injection. Inject at constant rate for predetermined duration.
4. At the end of the injection period, shut the well in at the wing-valve(s). Record the time of shut-in, rate prior to shut-in, and the shut-in pressure.
5. Secure the well.

6. Rig-down pump truck
7. After the pressure has been allowed to decline for approximately the same duration as the injection the test can conclude.

The data from this test will be analyzed using pressure transient analysis software, and the results will be included in the post installation reporting. Gauge calibration records will be provided at this time as well.

3.7 CCS1 Injection Well Mechanical Integrity Testing (146.87 (a)(4))

3.7.1 Internal Mechanical Integrity Testing (146.87 (a)(4)(i))

Internal mechanical integrity (Part I) refers to the integrity of the seal between the long string casing, injection tubing, wellhead, and packer as well as the integrity of the individual components. In this subsection, annulus refers to the casing-tubing annulus. The effectiveness of this seal can be confirmed with a mechanical integrity test (MIT) and annular pressure monitoring.

Part I of the mechanical integrity will be demonstrated by way of an annulus pressure test (APT) as is standard for UIC wells. The APT will be performed after the tubing, packer, downhole equipment, and the wellhead have been installed. Prior to the installation of the wellhead, the annulus will be filled with fluid as outlined in the Well Construction component of this application (Attachment 4: Well Construction, 2022).

The APT will then be performed by pressuring up the annulus after the well has reached thermal equilibrium. Once this has occurred, the annulus will be pressured up to 1,500 psi as outlined later in the application (Attachment 6: Well Operations, 2022). A calibrated digital gauge will be installed on the annulus, and the pressure will be monitored for a period no less than 60-minutes.

During this period, the casing and tubing pressure will be monitored at 5-minute intervals. Following the conclusion of the test, the gauge will be removed, and the casing pressure will be lowered to the normal operational pressure. The test will be considered successful if the pressure has deviated by less than 5% of the initial value.

In addition to this standard internal integrity monitoring, inspection of the tubing will be performed as it is being installed to monitor the tubing for corrosion (Attachment 7: Testing And Monitoring, 2022).

Once injection commences, injection pressure, annular pressure, and annular fluid volumes will be monitored continuously to ensure internal well integrity and proper annular pressure is maintained (Attachment 7: Testing And Monitoring, 2022).

3.7.2 External Mechanical Integrity (146.87 (a)(4)(ii – iv))

External mechanical integrity (Part II) refers to the absence of fluid movement/leaks through channels in the cement between the long string casing and the borehole. The upward migration of injected fluids through this zone could result in contamination of USDWs. The external integrity of CCS1 will be confirmed throughout the project. The frequency of the testing to determine Part II mechanical integrity will be performed on the schedule defined in the testing and monitoring plan (Attachment 7: Testing And Monitoring, 2022).

Generally accepted methods for evaluating external mechanical integrity include the following:

- Temperature or noise log,
- Oxygen-activation logging (OAL) or radioactive tracer (RAT) logging (during operation)

After completion, a baseline temperature log will be run from surface to the bottom of the long string casing [redacted] to provide initial temperature conditions over the well. Temperature logging performed after injection has started will be performed at regular intervals based on the schedule provided in the testing and monitoring plan. The results of these logs will be compared to the baseline log to determine if anomalies that suggest CO_2 is migrating up the well bore are present.

If the temperature logging data suggests an issue with external well integrity exists, a RAT log will be performed to evaluate external well integrity with greater sensitivity.

In addition to the baseline temperature log, a CBL, and advanced ultrasonic cement evaluation log will be run across the entire long casing string after completion of the injection well to confirm that the casing string was properly cemented. Cement Bond Logs-Variable Density Logs (CBL-VDLs) are recorded with sonic tools that detect the bond of the casing and formation to the cement between the casing and wellbore to identify damage. Ultrasonic tools provide higher accuracies and resolutions for cement evaluation.

3.8 CCS1 Injection Well Schedule (146.87 (f))

Cardinal Ethanol will provide Region 5 with the opportunity to witness all logging and testing detailed in this section. Cardinal Ethanol will 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, as much as reasonably possible.

Table 7 provides a tentative schedule based on the numbers of days to complete each well and the associated data to be collected. It is anticipated that the drilling schedule can be updated once CCS1 has been drilled, and once again when the Class VI permit is received.

The Pre-Operational Formation Testing Program for CCS1 consists of the following primary steps that are subject to change as circumstances dictate.

1. Determine the depth to the deepest USDW so surface casing can be set.
    a. Note: *This depth will be determined based on prior testing performed on USDW1, assuming that the lowest USDW is identified and tested.*
2. Drill the surface hole to the surface casing depth.
    a. [redacted] *Deviation surveys will be taken using method described in Section 3.1 of this document.*
3. Log the surface hole with open hole logs.
    a. Note: *a list of these logs is provided in Table 2 above.*
4. Install the surface casing and cement in place per the methodology described in the Well Construction Program (Attachment 4: Well Construction, 2022).
5. To ensure the isolation of the lowermost USDW and to confirm the integrity of cement-casing and cement-formation bond, a cement bond log will be run. Following this, and prior to drilling out the surface casing shoe, a casing pressure test will be completed.
    a. Note: *details on the casing pressure test are provided in* (Attachment 4: Well Construction, 2022).
6. Once the surface casing is cemented, tested and a good bond log has been run, the rig will drill through the surface casing shoe, then drill the well to TD. Sufficient rat hole will be drilled at such that the basement rock can be properly characterized.
    a. [redacted]
7. If, during drilling, a substantial lost circulation zone is encountered, an intermediate casing string will be used to isolate this zone.
    a. Note: *Steps 3, 4, and 5 will be completed to characterize this section of the formation and to confirm good cement bonding is present. A list of the logs to be run in this section is provided in Table 3.*
8. The well will be logged with open hole logs.
    a. Note: *a list of these logs is provided in Table 4.*
9. Assuming CCS1 is drilled first, whole core depths will be determined from CCS1 to guide coring depths in OBS1 in order to collect core from the reservoir and confining zone intervals. Sidewall core will be collected as required to fill in data gaps.
10. The long string casing will be installed and cemented in place per the methodology described in the Well Construction Program (Attachment 4: Well Construction, 2022).
11. Select intervals of the Mt. Simon Sandstone will be perforated and cleaned with acid per the methodology described in the Well Construction Program (Attachment 4: Well Construction, 2022).

12. The injection string, packer and wellhead will be installed per the methodology described in the Well Construction Program (Attachment 4: Well Construction, 2022).
13. Part I (internal) and Part (external) mechanical integrity will be displayed.
14. Fluid samples will be taken from the Mt. Simon Sandstone and will be analyzed for TDS, other major analytes, and stable isotopes.
    a. Note: *further detail on the fluid sampling is provided in Section 3.5 of this document.*
15. Geomechanical testing will be performed on the Mt. Simon Sandstone by means of an SRT to determine the in-situ fracture pressure of the formation.
16. Geomechanical testing will be performed on the core taken from the Eau Claire Formation as detailed in Section 3.4 of this document.
17. A pressure falloff test (FOT) will be performed on the well to determine reservoir parameters.

A detailed proposed scheduled and time breakdown (drilling curve) is provided in the well construction section.

Table 7: Tentative Schedule for Pre-Operational Testing

Well	Depth (ft)	Days	Data Sets
USDW1	[redacted]	3	1. USDW water quality sample
CCS1	[redacted]	20	1. Open hole logs 2. Special open hole logs 3. Cased hole logs 4. Mt. Simon Sandstone fluid sample(s) 5. Whole or sidewall core collected in OBS1 6. Geomechanical and reservoir testing
OBS1	[redacted]	20	1. Open hole logs 2. Cased hole logs 3. Whole or sidewall core (Mt. Simon Sandstone and Eau Claire Shale)**
ACZ1	[redacted]	10	Any potential missing data sets
[redacted] [redacted]			

4 References

(2022). *Attachment 1: Narrative.* Class VI Permit Application Narrative; Hoosier#1 Project, Vault 4401.

(2022). *Attachment 10: ERRP.* Emergency And Remedial Response Plan; Hoosier#1 Project, Vault 4401.

(2022). *Attachment 11: QASP.* Hoosier#1 Project, Vault 4401.

(2022). *Attachment 2: AOR and Corrective Action.* Area Of Review And Corrective Action Plan; Hoosier#1 Project, Vault 4401.

(2022). *Attachment 3: Financial Responsibility.* Financial Responsibility; Hoosier#1 Project, Vault 4401.

(2022). *Attachment 4: Well Construction.* Injection Well Construction Plan; Hoosier#1 Project, Vault 4401.

(2022). *Attachment 5: Pre-Op Testing Program.* Pre-Operational Formation Testing Program; Hoosier#1 Project, Vault 4401.

(2022). *Attachment 6: Well Operations.* Well Operation Plan; Hoosier#1 Project, Vault 4401.

(2022). *Attachment 7: Testing And Monitoring.* Testing And Monitoring Plan; Hoosier#1 Project, Vault 4401.

(2022). *Attachment 8: Well Plugging.* Hoosier#1 Project, Vault 4401.

(2022). *Attachment 9: Post-Injection Site Care.* Post-Injection Site Care And Site Closure Plan; Hoosier#1 Project, Vault 4401.