UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
AIR AND RADIATION

December 16, 2020

Mr. Carl Thunem
Perdure Petroleum, LLC
Webb City, Oklahoma 74652

Re: Monitoring, Reporting and Verification (MRV) Plan for North Burbank Unit

Dear Mr. Thunem:

The United States Environmental Protection Agency (EPA) has reviewed the Monitoring, Reporting and Verification (MRV) Plan submitted for the North Burbank Unit as required by 40 CFR Part 98, Subpart RR of the Greenhouse Gas Reporting Program. The EPA is approving the MRV Plan submitted by Perdure Petroleum LLC for the North Burbank Unit as the final MRV plan. The MRV Plan Approval Number is 1010975-1. This decision is effective December 21, 2020 and appealable to the EPA's Environmental Appeals Board under 40 CFR Part 78.

If you have any questions regarding this determination, please write to ghgreporting@epa.gov and a member of the Greenhouse Gas Reporting Program will respond.

Sincerely,

Julius Banks, Chief
Greenhouse Gas Reporting Branch

Technical Review of Subpart RR MRV Plan for North Burbank Unit

December 2020

Contents

This document summarizes the Environmental Protection Agency's (EPA's) technical evaluation of the Greenhouse Gas Reporting Program (GHGRP) Subpart RR Monitoring, Reporting, and Verification (MRV) Plan submitted by Perdure Petroleum LLC., hereafter referred to as Perdure, operator of the North Burbank Unit (NBU).

1 Overview of Project

Perdure states in the MRV plan that it has operated an enhanced oil recovery (EOR) facility with carbon dioxide (CO_2) in the North Burbank Unit (NBU) since 2017. Perdure submitted its MRV plan related to enhanced oil operations within the NBU, located in the Chautauqua Platform in western Osage County, Oklahoma. The Burbank Field's sandstone reservoir was discovered in 1920 in western Osage County, approximately 25 miles east of Ponca City, Oklahoma and 60 miles northwest of Tulsa, Oklahoma. For convenience, the Burbank Sandstone, Red Fork formation, and Bartlesville formation will be collectively referred to as the "reservoir." The reservoir exists at a depth of about 3,000 feet below the surface, and is 12 miles long and 4.5 miles wide, trending in a southeast-northwest direction. The sand is largely composed of fine and medium-grained quartz cemented with silica, dolomite, ankerite and calcite. Since its discovery in the 1920s, the Burbank Field has produced approximately 360 million barrels of oil.

The reservoir lies beneath approximately 3,000 feet of overlying sediments. The overlying sediments are composed of numerous impermeable formations that serve as reliable barriers to prevent fluids from moving upwards towards the surface. In the Burbank Field, the first seal is the Pink Limestone member of the Cabaniss formation in the Cherokee Group. Above this formation lie more than 10 additional intervals of impermeable rock layers of various thicknesses, including the Verdigris Lime, the "Big Lime," and the Avant/Iola Lime formations or members. These formations and members are highlighted in brown in Figure 4 of the MRV plan.

The reservoir is characterized by east-west jointing, or fracturing, which results in preferential east-west movement of fluids. For this reason, flooding operations in the NBU have generally been developed by injecting water in east-west rows of wells and producing alternate rows of wells. Section 2.3 of the MRV plan notes that the operational history of the Burbank Field demonstrates that there are no faults or fractures that penetrate the reservoir or otherwise provide for a fluid migration pathway out of the reservoir. The plan states that this lack of fluid migration pathways makes the NBU a strong candidate for CO_2-flooding operations. Fluids including water, CO_2 and polymers have been successfully injected into the NBU since 1950.

Perdure has developed operating procedures for the NBU based on its experience as a CO_2-EOR operator. The MRV plan states that operations include developing detailed modeling at the pattern level to inform injection pressures and performance expectations, as well as using experts with diverse disciplines to operate its EOR projects based on the site-specific characteristics. The amount of CO_2 injected into the NBU is the amount needed to balance the fluids removed from the reservoir and to increase oil recovery. The model output shows CO_2 injection and storage through 2060, although that may not represent the actual operational life of the NBU EOR project. Perdure's forecast estimates the total amount of CO_2 injected and stored over the modeled injection period to be 514 billion cubic feet (BCF) (27.11 million metric tons (MMT)). This represents approximately 46.7% of the theoretical storage capacity of the NBU. As of the end of 2019, 143.8 BCF (7.58 MMT) of CO_2 has been injected into the NBU. Of that total, 77.6 BCF (4.09 MMT) was produced and recycled.

The NBU was originally developed by numerous individuals and companies under several leases from the Bureau of Indian Affairs (BIA) and the Osage Nation in Osage County. To improve production efficiency, several leases were combined into larger units which are operated without the operational restrictions imposed by the former, smaller lease boundaries. CO_2-EOR operations began in the NBU on June 6, 2013 and have continued and expanded since then. The experience at NBU of operating and refining the waterflood since 1950 has created a strong understanding of the reservoir and its capacity to store CO_2. Perdure acquired the NBU from Chaparral Energy LLC in November 2017.

Perdure's facility operations consist of three primary processes: CO_2 distribution and injection, injection and production wells, and produced fluids handling and gas compression. The operations include equipment to capture CO_2 from various sources, dedicated pipelines, injection and production wells, a central processing facility for fluids, compressors, and equipment to process produced oil, associated water and CO_2 among other gases. Currently, all CO_2 injection wells receive CO_2 sourced from the Coffeyville CO_2 Pipeline, the NBU Recycle Compression Facility (RCF), or a combination of the two.

The MRV plan states that all of Perdure's injection wells in the NBU are classified as UIC Class II wells under the regulations of the EPA and Osage Nation. The MRV plan states that Osage Nation Department of Natural Resources coordinates the EPA Underground Injection Control grant at the NBU. The MRV plan notes that through this grant program, the Osage Nation conducts inspections of all Class II injection wells, observes plugging of Class II injection wells, observes injection well mechanical integrity tests, and assists EPA with compliance and enforcement on Class II wells.

Perdure plans to report under subpart RR of the GHGRP for a Specified Period over which Perdure will have a subsidiary or ancillary purpose of establishing long-term containment of a measurable quantity of CO_2 in the reservoir at the NBU. The MRV plan states that Perdure's primary purpose for injecting CO_2 is to produce oil that would otherwise remain trapped in the reservoir, and that the Specified Period will be shorter than the planned period of oil production from the Perdure facility. When the Specified Period is ended, Perdure will submit a request for discontinuation of reporting. The MRV plan notes that Perdure will submit this request when it can provide demonstration that current monitoring and model(s) show that the cumulative mass of CO_2 reported as sequestered during the Specified Period is not expected to migrate in the future in a manner likely to result in surface leakage. Specifically, the MRV plan states that this demonstration will rely on three principles:

1) the amount of CO_2 stored in any properly plugged and abandoned wells will be considered unlikely to migrate to the surface;
2) the continued process of fluid management; and

3) the cumulative mass reported as sequestered during the Specified Period is a fraction of the theoretical storage capacity of the NBU.

Perdure expects that this can be demonstrated within three years after the Specified Period has ceased.

In their MRV plan, Perdure indicates that future modifications of the CO_2-EOR operations are likely and may include securing additional CO_2; modifying, adding or closing wells; deepening existing wells or drilling new wells to a deeper formation for CO_2 injection into that formation; and adding new facility equipment or pipelines. The modifications are described in the MRV plan as a continuation of the current integrated configuration and MRV approach and are not a material change requiring a revised MRV plan. Perdure would indicate any such changes in their annual monitoring report. Their monitoring report, as explained in the MRV plan, would include any new site characterization, risk assessment, monitoring, and mass balance information with existing provisions for the MRV continuing to apply.

The MRV plan provides a description of the facility, including the site setting, processes, operations, and plans for potential future expansion of the CO_2-EOR into other areas of the NBU. The existing injection wells are permitted as UIC Class II wells and the UIC injection well identification numbers are provided in the MRV plan. The MRV plan anticipates that any future injection wells will also be permitted as Class II wells.

The description of the project is determined to be acceptable and provides the necessary information to comply with 40 CFR 98.448(a)(6).

2 Evaluation of the Delineation of the Maximum Monitoring Area (MMA) and Active Monitoring Area (AMA)

As part of the MRV Plan, the reporter must identify both the maximum monitoring area (MMA) and the active monitoring area (AMA), pursuant to 40 CFR 98.448(a)(1). Subpart RR defines maximum monitoring area as “the area that must be monitored under this regulation and is defined as equal to or greater than the area expected to contain the free phase CO_2 plume until the CO_2 plume has stabilized plus an all-around buffer zone of at least one-half mile.” Subpart RR defines active monitoring area as “the area that will be monitored over a specific time interval from the first year of the period (n) to the last year in the period (t). The boundary of the active monitoring area is established by superimposing two areas: (1) the area projected to contain the free phase CO_2 plume at the end of year t, plus an all-around buffer zone of one-half mile or greater if known leakage pathways extend laterally more than one-half mile; (2) the area projected to contain the free phase CO_2 plume at the end of year t + 5.” See 40 CFR 98.449.

Perdure has defined the MMA area as the boundary of the NBU plus a 0.5-mile radius buffer and the AMA as the boundary of the NBU itself. Factors considered include: the extent of free-phase CO_2 within the NBU, the operational strategies to retain injected CO_2 within the unit, and the geological structure of the unit. The MRV plan states that current operations strictly maintain the water curtain in the CO_2-EOR area to prevent CO_2 migration outside the west edge of the NBU. Over geologic time frames, the MRV plan states that the injected CO_2 will remain in the NBU and will not migrate downdip to the western edges of the NBU because the reservoir in the unit boundary of the NBU is higher in elevation than the reservoir west of the NBU unit boundary. While the reservoir in the Stanley Stringer to the east and northeast of the NBU is higher in elevation than the reservoir in the NBU, the water curtain injection (WCI) operations, described in section 2.3 of the MRV plan, have been used to isolate the Stanley Stringer field and the NBU for decades. As CO_2 injection operations are expanded beyond the currently active CO_2-EOR portion of the NBU into other areas of the NBU, the AMA is anticipated to expand to include areas of the NBU where CO_2 is injected.

The MMA, as it is defined in the MRV plan, is consistent with subpart RR requirements because the defined MMA accounts for the expected free phase CO_2 plume, based on modeling results, and incorporates the additional 0.5-mile or greater buffer area.

The modeling and well production performance monitoring described in section 4.1 of the MRV plan supports a high level of confidence that appropriate monitoring over a sufficient area will be performed. The rationale used to delineate the MMA, as described in Perdure's MRV plan, accounts for the existing operational and subsurface conditions at the site along with any potential changes in future operations. Therefore, the designation of the AMA as the NBU and MMA designation that covers all the NBU, plus a 0.5-mile buffer, is a reasonable approach.

The delineation of the MMA and AMA was determined to comply with 40 CFR 98.448(a)(1). The MMA and AMA described in the MRV plan are clearly and explicitly delineated and are consistent with the definitions in 40 CFR 98.449.

3 Identification of Potential Surface Leakage Pathways

As part of the MRV Plan, the reporter must identify potential surface leakage pathways for CO_2 in the MMA and the likelihood, magnitude, and timing of surface leakage of CO_2 through these pathways pursuant to 40 CFR 98.448(a)(2). Perdure identified the following as potential leakage pathways in their MRV plan that required consideration:

- Well bores;
- Faults and fractures;
- Natural and induced seismic activity;
- Prior operations;
- Pipeline and surface equipment;
- Lateral migration outside the NBU;
- Drilling through the CO_2 area; and
- Diffuse leakage through the seal.

3.1 Leakage through Well Bores

As of January 2020, there were approximately 451 active completed wells in the NBU. The MRV plan states that about 266 of those wells were production wells and about 185 were injection wells. In addition, there were approximately 2,394 wells not in use that penetrate the reservoir that were classified as being inactive, temporarily abandoned, shut in, or plugged and abandoned. Perdure identifies that leakage through wells bores is a potential risk in the NBU that can be prevented by: adhering to regulatory requirements for well drilling and testing; implementing best practices that Perdure has developed through its operating experience; monitoring performance of injection and production operations; monitoring wellbore integrity and surface operations; and maintaining surface equipment.

New wells that are drilled into the reservoir are designed to be cemented all the way from the formation to the surface. Figure 12 of the MRV plan depicts a diagram of a typical new well drilled in the NBU and provides an example of new well construction by showing intervals of cement over crucial formations. As of January 1, 2020, approximately 17 of the 451 active completed wells have been drilled in this manner, and 100% of the new wells drilled since Perdure took over operations of the NBU in 2017 have been drilled in this manner.

According to section 4 of the MRV plan, continuous surveillance of injection parameters, routine inspections, and mechanical integrity testing (MIT) will reduce the risk of leakage from the injection wells. Additionally, as applied to other surface equipment, visual inspections of the well sites are performed on a weekly, if not daily, basis. Perdure maintains well maintenance and workover crews onsite and field personnel conduct routine field inspections. The MRV plan states that the field personnel are trained to identify leaking CO_2 and any other potential problems at wellbores and in the field.

The MRV plan states that the injection plans for each well pattern are programmed to govern the rate, pressure and duration of either water or CO_2 injection. Pressure monitors on the injection wells are also programmed to flag any pressures that significantly deviate from the plan. The plan states that leakage on the inside or outside of the injection wellbore would affect pressure and be detected through this approach. Based on Perdure's experience, they state in the MRV plan that this leakage out of the intended zone and to the surface is unlikely.

Thus, the MRV plan provides an acceptable characterization of the likelihood of a CO_2 leakage that could be expected from existing wells and from potential future drilling.

3.2 Leakage through Faults and Fractures

According to section 4.2 of the MRV Plan, Perdure asserts that leakage of CO_2 from the reservoir through faults and fractures is not likely because there are no known faults or fractures that penetrate in the reservoir, other than as described in section 2.3, that provide a potential pathway for upward fluid flow. In section 2.3, east-west jointing, or fracturing, is described, showing that the effective permeability in the east-west direction is five times as great as that in the north-south direction. This results in a preferential east-west movement of injected fluid, as CO_2 injection strategies take advantage of this characteristic. Perdure asserts in the MRV plan that the presence of oil and gas trapped in the deep subsurface of the NBU provides proof that faults and fractures do not provide a potential pathway for upward flow of CO_2 from the reservoir. Perdure also asserts that they have extensive experience in designing, implementing, and operating EOR projects to ensure that injection pressures will not damage the oil reservoir by inducing new fractures or creating shear. The plan states that injection pressures are monitored so that they do not exceed the fracture pressures, even in cases when injection well permits authorize injection pressures that exceed fracture pressures.

Thus, the MRV plan provides an acceptable characterization of the likelihood of CO_2 leakage that could be expected through faults and fractures.

3.3 Leakage through Natural and Induced Seismic Activity

The MRV plan states that while there has been a significant increase in earthquakes over the past 15 years in this part of Oklahoma, there is no direct evidence to suggest that natural seismic activity poses a significant risk for loss of CO_2 to the surface from the NBU. Section 4.3 of the MRV plan provides information regarding induced seismicity from produced water injection into the Arbuckle formation in areas of the state where the Arbuckle contacts the crystalline basement. The MRV plan cites a study that concludes that the majority of observed earthquakes in Oklahoma (from 2009 to 2016) were traced to fluid injection in the Arbuckle near the crystalline basement. Perdure does not inject CO_2 into the Arbuckle formation or in a formation adjacent to the crystalline basement. Additionally, the Arbuckle formation is much deeper than the CO_2 injection reservoir and is not directly above the basement rock in the NBU boundary. Perdure also makes the case that injection of CO_2 resulting in the production of fluids, like that in a CO_2-EOR operation, where the objective is to maintain a constant reservoir pressure, is much different from a disposal operation where produced water is constantly injected without any other fluid production, and where pressure in the disposal zone can increase.

Perdure cites figures 14 through 17 in section 12.4 of the MRV plan to illustrate the efforts of the State of Oklahoma, its regulators, and industry participants in reducing the incidence of significant earthquakes within the state. The MRV plan states that this trend in reducing earthquakes resulting from induced seismic activity demonstrates that actions taken in recent years have significantly reduced the risk of earthquakes caused by injection of produced water into the Arbuckle formation – none of which involves the geographic area containing the NBU, and none of which involves the reservoir which is approximately 1,400 feet less deep compared to the Arbuckle formation.

Thus, the MRV plan provides an acceptable characterization of the likelihood of leakage from natural and induced seismic activity.

3.4 Leakage as a Result of Prior Operations

The MRV plan states that CO_2 flooding in the NBU began in 2013. Perdure and prior operators have maintained records of the NBU, including active and abandoned wells. The MRV plan ensures that standard drilling practices include a review of records to ensure that drilling will not cause damage to any nearby active or abandoned wells. Area of review (AOR) requirements for Class II wells include identification of all active and abandoned wells in the AOR and implementation of procedures to ensure integrity of both active and abandoned wells. Perdure states that identified wells are sufficiently isolated and do not interfere with CO_2 injection, enhanced oil recovery, and reservoir pressure maintenance operations. Perdure and prior operators have checked for the presence of old, unknown wells throughout the NBU over decades. The MRV plan states that this operational experience supports the conclusions that there are no unknown wells within the NBU and that the risk of migration from older wells has been sufficiently mitigated.

Thus, the MRV plan provides an acceptable characterization of the likelihood of leakage as a result of prior operating activities.

3.5 Leakage from Pipeline and Surface Equipment

Perdure asserts in their MRV plan that they will reduce the risk of unplanned losses of CO_2 from pipeline and surface equipment to the maximum extent through the use of prevailing design and construction practices, routine maintenance, periodic inspection procedures as well as maintaining compliance with applicable regulations. Field operations include frequent routine visual inspection of surface facilities, which Perdure states will provide an additional way to detect leaks and further support efforts to detect and remedy any leaks in a timely manner. The amounts of CO_2 lost through pipeline and surface equipment will be determined by: (a) following the Subpart W methodology approach described in section 5.5 of the MRV plan; (b) using direct metering to measure specific venting events, and; (c) using engineering best practices to estimate a loss in the rare event of an extreme event. Perdure's Subpart W methodology approach is used to evaluate and estimate leaks from equipment, the CO_2 content of produced oil, and vented CO_2 – including for CO_2 emitted from equipment leaks and vented emissions of CO_2 from surface equipment located between (a) the injection flowmeter and the injection wellhead, and (b) the production flowmeter and the production wellhead.

Thus, Perdure's maintenance and procedural monitoring as described in the MRV plan provides an acceptable characterization of the likelihood of a CO_2 leak that could be expected from pipelines and surface equipment, with associated response procedures in place to appropriately respond should a leak occur.

3.6 Leakage from Lateral Migration

In the MRV plan, several factors are listed to demonstrate that lateral leakage of CO_2 outside the boundaries of the NBU is unlikely. Water Curtain Injection (WCI) methods are deployed by Perdure during CO_2-EOR operations in the NBU to prevent lateral migration of CO_2 out of the unit boundary. Continuous WCI operations conducted at the NBU boundaries create a pressure barrier to contain injected fluids within the NBU. Further, containment is stated to be provided by the inherent geology of the NBU. The MRV plan states that this, in conjunction with WCI operations at the NBU boundaries, make it unlikely for CO_2 to migrate downdip and laterally outside the NBU.

An earlier operator's over-production of the western water curtain, as described in section 3.1 of the MRV plan, illustrates the importance of WCI operations management in the NBU. Perdure plans to maintain the reservoir waterflooding operations consistent with how they were successfully conducted from 1950-2013. Perdure modified the CO_2 injection and production operations in 2017 to prevent over production of the water curtain on the NBU's western edge, which is downdip in the reservoir. As a result of these efforts and the reservoir's geological characteristics, Perdure states that they do not expect injected CO_2 to migrate downdip and laterally outside the NBU. Should leakage occur, Perdure plans to determine the most appropriate methods for quantifying the volume leaked, which would likely include measured or engineering estimates of relevant parameters (e.g. CO_2 flow rate, concentration, duration), and will report it as required as part of the annual Subpart RR submission.

Thus, the MRV plan provides an acceptable characterization of the likelihood of CO_2 leakage that could be expected from lateral migration.

3.7 Leakage from Drilling Operations

The MRV plan states that future drilling through the Burbank formation could occur and inadvertently create a leakage pathway. Perdure characterizes CO_2 leakage from drilling operations as very low risk because of the regulatory requirements, routine inspections, and operational drivers behind drilling. EPA UIC regulations regarding Class II injection wells require that any fluids be contained in strata in which they are encountered. In addition, Perdure's visual inspection process is designed to identify unapproved drilling activity in the NBU, especially where Perdure owns substantial portions of the surface estate. Lastly, the MRV plan states that Perdure plans to conduct CO_2-EOR operations in the NBU for decades and has a commercial interest in protecting the integrity of the wells and maximizing resource recovery.

Thus, the MRV plan provides an acceptable characterization of the likelihood of CO_2 leakage that could be expected from drilling through the CO_2 area.

3.8 Leakage through the Formation Seal

The seal for the NBU is the overlying Pink Limestone member of the Cherokee formation. The seal is composed of several feet of salt, shale, and tight carbonate. The MRV plan states that diffuse leakage of the injected CO_2 through the seal is highly unlikely and improbable, as it is a proven natural seal given the containment of fluids which have been trapped by the seal over geologic time. Further, if CO_2 were to migrate through the seal, Perdure asserts in the MRV plan that it would be encountered and trapped by the secondary seal, which is the Oswego Limestone member of the Marmaton formation, or any of the additional shallower seals indicated in brown in Figure 4 of the MRV plan.

The MRV plan states that geo-mechanical analyses were conducted using wireline logs and core tests for certain wells in the NBU and that analytical techniques were used to estimate changes in minimum horizontal stress caused by changes in pressure and temperature during CO_2 injection. These analyses and techniques were used to determine whether the stress state compromises the ability of the reservoir for safe and effective CO_2 storage. Based on this, the plan states that it was determined that the fracturing of the reservoir or caprock is not likely, as long as the injection pressure is maintained below the EPA UIC permit injection pressure limit.

Thus, the MRV plan provides an acceptable characterization of the likelihood of CO_2 leakage that could be expected through the formation seal.

4 Strategy for Detecting and Quantifying Surface Leakage of CO_2 and for Establishing Expected Baselines for Monitoring

Section 5 of the MRV plan outlines Perdure's strategy for detecting and verifying potential surface leakage. Perdure's approach primarily includes monitoring of injection wells, well maintenance, monitoring of surface infrastructure, and field inspections (visual inspections and H_2S and CO_2 detection by personnel and in-field monitoring equipment). 40 CFR 98.448(a)(3) requires that an MRV Plan contain a strategy for detecting and quantifying any surface leakage of CO_2, and 40 CFR 98.448(a)(4) requires that an MRV Plan include a strategy for establishing the expected baselines for monitoring CO_2 surface leakage. Section 6 gives Perdure's strategy for detecting and verifying potential subsurface leakage and establishing baselines against which monitoring results are compared. The MRV plan describes both an acceptable strategy for detecting and quantifying any surface leakage of CO_2 based on the identification of potential leakage risks, as well as establishing baselines for monitoring against which potential suspected leaks can be identified, evaluated, and, if necessary, quantified.

Perdure follows industry standard metering protocols for custody transfers to accurately measure mass flow. The current sole source of CO_2 received by the NBU is from the Coffeyville CO_2 pipeline, which is a documented commercial transaction. Other metered input/output sites include the NBU Recycle Compression Facility, injection wells, and any production satellites.

Perdure's monitoring approach includes collecting flow, pressure, temperature and gas composition data from wells and facilities in the NBU, which is then stored in the company's data management system. Onsite management and a supervisory control and data acquisition (SCADA) system are used to collect data from CO_2-EOR operations, identify, and investigate any variances from expected performance that may indicate leakage and to otherwise monitor for surface leakage.

Fluid composition will be determined quarterly to be consistent with subpart RR specifications in section 98.447(a). The MRV plan states that all meter and composition data are documented, and records will be retained for the Specified Period. Any facilities added during the Specified Period would also be managed and monitored in the same manner.

If any leakage were to occur, Perdure will use an event-driven process to assess, track and quantify the amount of CO_2 leakage at the surface.

4.1 Injection/Production Zone Leakage

Potential leakage is monitored through daily pressure, volume, runtime, and temperature measurements of injection into and production from the reservoir. This daily monitoring is used as a means of early identification of potential anomalies that could indicate leakage of CO_2 from the subsurface. If leakage is detected, the plan states that an appropriate method will be used to quantify the leaked volume of CO_2, such as using a material balance equation based on the history of injected quantities and monitored pressures. If no leak is detected at the surface, relevant parameters (rate, concentration, and duration) would be used to quantify the leakage volume to the subsurface, if suspected.

4.2 Wellbore Leakage

The MRV plan describes how Perdure monitors wells through continual, automated pressure monitoring in the injection zone (as described in section 4.1), monitoring of the annular pressure in wellheads, and routine maintenance and inspection. Visual inspections may include tank volumes, equipment status and reliability, lube oil levels, pressures and flow rates in the facility, valve leaks, checking that injectors are on the proper WAG schedule, and observing the facility for visible CO_2 or fluid line leaks. In the event a wellbore does not sufficiently satisfy a mechanical integrity test (MIT), then the wellbore is shut-in until a satisfactory repair in implemented, such as a workover. When the repair is made, another MIT is performed and, upon satisfying that test, operations on the wellbore are resumed upon receipt of any necessary regulatory approval to re-establish operations again. Perdure does not anticipate reporting under subpart W given their historical emissions, but they do plan to account for certain emission calculations using subpart W approaches regardless of whether they meet the threshold for subpart W reporting.

4.3 CO_2 and H_2S Detection

Perdure states that it will use the same visual inspection and H_2S monitoring system to detect other potential leakage at the surface as it does for leakage from wellbores. Inspections are run on a routine basis. In addition to the visual inspections, the results of the personal H_2S monitors worn by operations personnel will be a supplement for smaller leaks that may escape visual detection. The H_2S monitors' detection limit is 10 ppm.

4.4 Well Testing

On an annual basis, the subsurface and wellhead valves are leak tested for mechanical integrity testing (MIT) as required by relevant state and federal regulatory agencies. This consists of regular monitoring of the tubing-casing annular pressure and conducting a test that pressures up the well and wellhead to verify the well and wellhead can hold the appropriate amount of pressure. Personnel monitor the pressure and conduct tests in accordance with the regulations and permit requirements. If investigation of an event identifies a CO_2 leak, it will be reported and documented alongside the development of a plan to correct the issue.

4.5 Determination of Baselines for Monitoring CO_2 Surface Leakage

Pressure monitoring of injection wells, along with the operational and monitoring data used to determine the baseline, is an established way to detect leaks in the injection wells. High and low set points are established in the monitoring program and operators are alerted if a parameter is outside the allowable window. Based on the described strategy, if results of the monitoring activities fall outside their normal predicted ranges, Perdure will initiate an investigation to determine if a leak has occurred. If investigation of an event identifies a CO_2 leak, it will be reported and documented alongside the development of a plan to correct the issue.

The strategy for detecting and quantifying surface leakage of CO_2 and for establishing expected baselines for monitoring is determined to comply with 40 CFR 98.448(a)(3) and 40 CFR 98.448(a)(4). The strategies described in the MRV plan are clearly and explicitly delineated and are consistent with subpart RR requirements.

5 Considerations Used to Calculate Site-Specific Variables for the Mass Balance Equation

5.1 Calculation of Mass of CO_2 Received

Perdure proposes to use equation RR-2 per 40 CFR 98.443(a)(2) to calculate the amount of CO_2 received. The equation is:

$$CO_{2T,r} = \sum_{p=1}^{4} \left(\varrho_{r,p} - S_{r,p}\right) * D * C_{CO_{2\,p,r}}$$

Where:

$CO_{2T,r}$ = Net annual mass of CO_2 received through flow meter r (metric tons).

$Q_{r,p}$ = Quarterly volumetric flow through a receiving flow meter r in quarter p at standard conditions (standard cubic meters).

$S_{r,p}$ = Quarterly volumetric flow through a receiving flow meter r that is redelivered to another facility without being injected into your well in quarter p (standard cubic meters).

D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682.

$C_{CO2,p,r}$ = Quarterly CO_2 concentration measurement in flow for flow meter r in quarter p (vol. percent CO_2, expressed as a decimal fraction).

p = Quarter of the year.

r = Receiving flow meter.

Perdure provides an acceptable approach to calculating each of these variables in section 7.1 of the MRV Plan.

5.2 Calculation of Total Annual Mass of CO_2 Injected

Perdure will determine the amount of CO_2 injected by using volumetric flow meters which are used to measure the injection volumes at each well. Equation RR-6 will be used to calculate the annual total mass of CO_2 injected, as described in section 7.2 of the MRV plan.

Perdure's proposed approach for calculating the total annual mass injected is acceptable for the subpart RR requirements.

5.3 Calculation of Total Annual Mass of CO_2 Produced

The mass of CO_2 produced from the NBU's production wells will be determined through equation RR-8 and RR-9, as described in section 7.3 of the MRV plan. Equation RR-8 will be used to calculate the mass of CO_2 produced from the production wells, while equation RR-9 will be used to calculate CO_2 produced in addition to the mass of CO_2 entrained in oil in the reporting year. Similar to injection well data, using the data at each individual production well would likely give an inaccurate estimate of the total mass of CO_2 produced due to the large number of wells and their error potential given the allowable calibration ranges for each meter. Rather, the measurements will be taken from: (1) the flow meters at the production satellites and any meters at the inlet to the RCF; and (2) the custody transfer meters for oil sales. The MRV plan states in equation RR-9 that the mass of the CO_2 entrained in oil in the reporting year will be measured utilizing commercial meters and electronic flow measurement devices at each point of custody transfer, with such mass of CO_2 calculated by multiplying the total volumetric rate by the CO_2 concentration.

Perdure's proposed approach for calculating the total annual mass produced is acceptable for the subpart RR requirements.

5.4 Calculation of Total Annual Mass of CO_2 Emitted by Surface Leakage

For reporting of the total annual CO_2 mass sequestered under subpart RR, potential surface leaks must be accounted for in the mass balance equation. Pursuant to 40 CFR 98.448(a)(2), an MRV Plan must describe the likelihood, magnitude, and timing of surface leakage of CO_2 through potential pathways. Subpart RR also requires that the MRV plan identify a strategy for establishing a baseline for monitoring CO_2 surface leakage, pursuant to 40 CFR 98.448(a)(4).

Equation RR-10 would be used to calculate and report the mass of CO_2 emitted by surface leakage. Perdure discusses surface leakage and equipment leakage together in their MRV plan because the proposed methods for both detection and emissions estimation will be based on the same techniques. This approach is discussed in section 5.1 of the MRV plan. The plan's approach, using techniques from subpart W of the GHGRP, is reasonable for estimating potential emission from potential surface leakage given the likelihood, magnitude and timing of surface leakage described above.

5.5 Calculation of Mass of CO_2 Sequestered

Perdure will use equation RR-11 to calculate the mass of CO_2 sequestered in subsurface geologic formations in the reporting year. Perdure will sum the total annual volumes for the cumulative mass of CO_2 sequestered. Perdure proposes an acceptable approach for calculating mass of CO_2 sequestered.

6 Summary of Findings

The subpart RR MRV plan for the North Burbank Unit facility meets the requirements of 40 CFR 98.238. The regulatory provisions of 40 CFR 98.238(a), which specifies the requirements for MRV plans, are summarized below along with a summary of relevant provisions in North Burbank Unit's MRV Plan.

Subpart RR MRV Plan Requirement	North Burbank Unit MRV Plan
40 CFR 98.448(a)(1): Delineation of the maximum monitoring area (MMA) and the active monitoring areas (AMA).	Section 3 of the MRV Plan describes the MMA and AMA. The MMA is delineated as equal to or greater than the boundary of the NBU, plus an all-around buffer zone of at least one-half mile and the AMA is defined as the boundary of the NBU. The MMA and AMA delineations consider site characterization and reservoir modeling along with prior operating experience.
40 CFR 98.448(a)(2): Identification of potential surface leakage pathways for CO_2 in the MMA and the likelihood, magnitude, and timing, of surface leakage of CO_2 through these pathways.	Section 4 of the MRV Plan identifies and evaluates potential surface leakage pathways. The MRV Plan identifies the following potential pathways: well bores, faults and fractures, natural and induced seismicity, prior operations, pipeline and surface equipment, lateral

	migration, drilling operations, and the reservoir seal. The MRV Plan analyzes the likelihood, magnitude and timing of surface leakage through these pathways. Perdure determined that these leakage pathways are highly improbable to minimal at the NBU facility and it is very unlikely that potential leakage conduits would result in significant loss of CO_2 to the atmosphere.
40 CFR 98.448(a)(3): A strategy for detecting and quantifying any surface leakage of CO_2.	Section 5 of the MRV Plan describes how the facility would detect CO_2 leakage to the surface, such as monitoring of existing wells, field inspections, and pressure monitoring. Section 5 and 7 of the MRV Plan describe how surface leakage would be quantified.
40 CFR 98.448(a)(4): A strategy for establishing the expected baselines for monitoring CO_2 surface leakage.	Section 6 of the MRV Plan describes the baselines against which monitoring results will be compared to assess potential surface leakage.
40 CFR 98.448(a)(5): A summary of the considerations you intend to use to calculate site-specific variables for the mass balance equation.	Section 7 of the MRV Plan describes Perdure's approach to determining the amount of CO_2 sequestered using the subpart RR mass balance equation, including as related to calculation of total annual mass emitted as equipment leakage.
40 CFR 98.448(a)(6): For each injection well, report the well identification number used for the UIC permit (or the permit application) and the UIC permit class.	Section 12.7 in the MRV Plan provides well identification numbers for each injection well. The MRV Plan specifies that all injection wells are permitted as UIC Class II wells.
40 CFR 98.448(a)(7): Proposed date to begin collecting data for calculating total amount sequestered according to equation RR-11 or RR-12 of this subpart.	The MRV Plan states that the North Burbank Unit Facility has begun implementation of this MRV plan as of January 1, 2020.

Appendix A: Final MRV Plan

North Burbank Unit (NBU)
CO_2 Monitoring, Reporting, and Verification (MRV) Plan

Perdure Petroleum

September 18, 2020

Table of Contents

Introduction

Perdure Petroleum LLC (Perdure) operates the North Burbank Unit (NBU) located near Shidler, Oklahoma for the primary purpose of enhanced oil recovery (EOR) using carbon dioxide (CO_2) with a subsidiary or ancillary purpose of geologic sequestration of CO_2 in a subsurface geologic formation. Perdure has been operating the NBU since 2017. Perdure acquired the NBU from Chaparral Energy LLC, which initiated the CO_2-EOR project in 2013. Perdure intends to continue CO_2-EOR operations until the end of the economic life of the CO_2-EOR program.

Perdure has developed this monitoring, reporting and verification (MRV) plan in accordance with the rules and regulations in Subpart RR of the Mandatory Greenhouse Gas Reporting Program, 40 CFR Sections 98.440-98.449,[1] to provide for the monitoring, reporting and verification of geologic sequestration in the Burbank reservoir during the injection period in the geographic area defined as the unit boundary of the NBU. This MRV Plan meets the requirements of Section 98.440(c)(1).

This MRV Plan contains the following 12 sections:

- Section 1 contains facility information.
- Section 2 contains the project description. This section estimates the years of CO_2 injection, provides the estimated tons of CO_2 to be injected and stored at the NBU, describes the geology of the NBU, details the operational history of the NBU, and provides an overview of the injection program and project facilities. This section also demonstrates the suitability for secure geologic storage in the reservoir.
- Section 3 contains the delineation of the monitoring areas.
- Section 4 evaluates the potential leakage pathways and demonstrates that the risk of CO_2 leakage through the identified pathways is minimal.
- Section 5 provides information on the detection, verification and quantification of leakage. Leakage detection incorporates several monitoring programs, each of which are described. Detection efforts will be focused towards managing potential leaks through the injection wells and surface equipment due to the improbability of leaks through the seal or faults and fractures.
- Section 6 describes the determination of expected baselines to identify excursions from expected performance that could indicate CO_2 leakage.
- Section 7 provides the mass balance equations and the methodology for calculating volumes of CO_2 stored or sequestered.
- Section 8 provides the estimated schedule for implementation of the MRV Plan.
- Section 9 describes the quality assurance program.

[1] Any "Subpart" referenced in this Plan is a subpart of 40 CFR Part 98, and any reference in this Plan to a "Section 98.xxx" refers to that section in 40 CFR Part 98.

- Section 10 describes some methods for revising this MRV Plan.
- Section 11 describes the records retention process.
- Section 12 includes several Appendices.

In addition to complying with the rules and regulations in Subpart RR for the monitoring, reporting and verification of geologic sequestration in the reservoir during the injection period in the geographic area defined as the NBU, the rules and regulations in Subpart W will inform the activities described in this MRV Plan as explained in more detail in Section 5.5 below.

1. Facility Information

1.1. Reporter Number

The North Burbank Unit facility reports under Greenhouse Gas Reporting Program Identification number 553337. The facility is located at or near 36.82491, -96.73257, Webb City, Oklahoma.

1.2. UIC permit class: Class II

The NBU is located in Osage County, Oklahoma. While the Oklahoma Corporation Commission regulates oil and gas activities in 76 of the 77 counties in Oklahoma, the UIC program for Osage County, Oklahoma is different. For purposes of the Environmental Protection Agency (EPA) Underground Injection Control (UIC) program, UIC Class II wells for the Osage Mineral Estate are permitted pursuant to 40 CFR Part 147 Subpart GGG Sections 147.2901-147.2929.[2] As a result of these regulations, UIC Class II permits in the Osage Mineral Estate are regulated by the Osage UIC office, as well as the EPA Region 6 Administrator. All of the injection wells in the NBU are classified as UIC Class II wells under these regulations.

1.3. UIC injection well identification numbers

Wells in the NBU are identified by name and API number. The API numbers for the injection wells in the NBU, as of January 1, 2020, are listed in Section 12.7. Any new wells in the NBU will be indicated in the annual report.

2. Project Description

Perdure exclusively operates all wells within the North Burbank Unit (NBU), which produces oil (and sometimes gas) from the geologic reservoir. Numerous aspects of the geology, facilities, equipment, and operational procedures are similar throughout the NBU. Because of these similarities, one MRV Plan is being prepared for the entire NBU. This section describes the geologic setting and characteristics of the NBU, the estimated years of CO_2 injection, the tons of CO_2 to be injected and stored at the NBU, and the injection process and CO_2-EOR project facilities.

[2] All of the mineral estate in the 1.47 million-acre Osage County, including the oil, gas and other subsurface minerals in Osage County, is known as the Osage Mineral Estate. According to the Osage Allotment Act of June 28, 1906, the United States holds title to the Osage Mineral Estate in trust for the Osage Nation, which is the beneficial owner of the Osage Mineral Estate.

2.1. Estimated years of CO_2 injection

A long-term performance forecast for the NBU has been conducted using the reservoir modeling approaches described in Section 4.1 below. In general, that forecast includes the estimated years of CO_2 injection and the estimated amounts of CO_2 anticipated to be injected and stored in the NBU as a result of current and planned CO_2-EOR operations during the modeling period, based on historic and predicted data. The forecast is based on results from a reservoir model that is used to develop injection plans for each injection pattern. This forecast is merely that: a forecast or prediction; actual data will be collected, assessed and reported as described in other portions of this MRV Plan to demonstrate the tons of CO_2 injected and stored at the NBU. The receipt and injection of CO_2 into the NBU commenced in 2013 and has continued since that time. The forecast anticipates that CO_2 will continue to be received at the NBU until at least 2060.

Figure 1 is a visual representation of a portion of the long-term performance forecast. Figure 1 reflects the actual (historic) amount of CO_2 injection and stored volumes in the NBU for the period beginning in 2013 when CO_2-EOR flooding was commenced in the NBU through 2019, as well as the projected tons to be injected and stored through 2040.

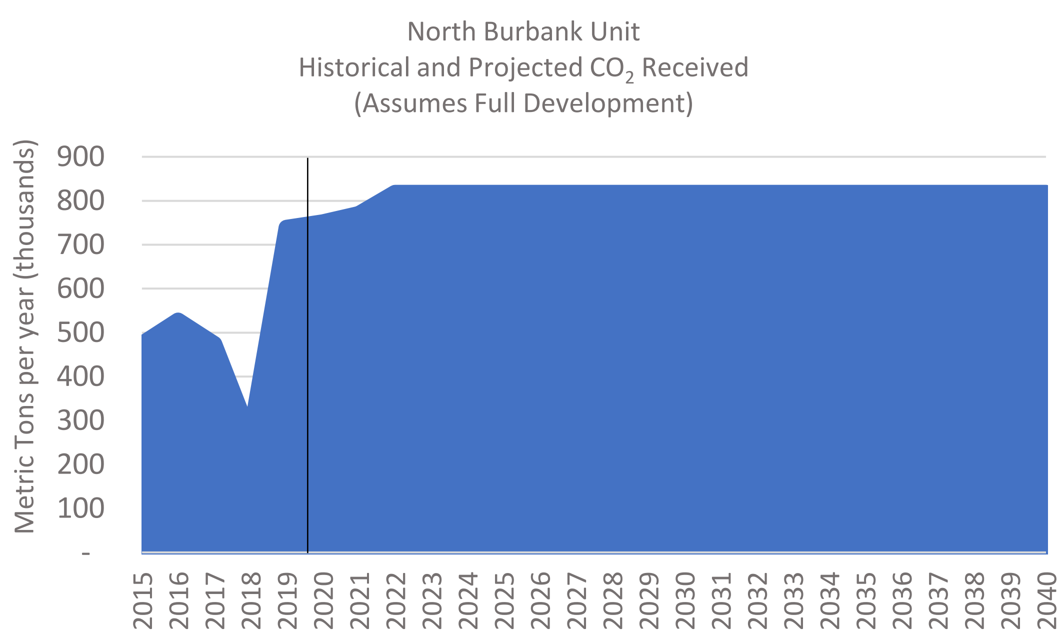

Figure 1 –Historic and Forecast CO_2 Injection and Storage at the NBU

2.2. Estimated tons of CO_2 injected and stored

The amount of CO_2 injected at the NBU is adjusted periodically to maintain reservoir pressure and to increase recovery of oil by extending or expanding the EOR project. The amount of CO_2 injected is the amount needed to balance the fluids removed from the reservoir and to increase oil recovery. While the model output shows CO_2 injection and storage through 2060, this data is for planning purposes only and may not necessarily represent the actual operational life of the NBU EOR project. As of the end of 2019, 143.8 BCF (7.58 million metric tons (MMT)) of CO_2 has been injected into the NBU. Of that amount, 77.6 BCF (4.09 MMT) was produced and recycled.

While tons of CO_2 injected and stored will be calculated using the mass balance equations described in Section 7, the forecast described above reflects that the total amount of CO_2 injected and stored over the modeled injection period to be 514 BCF (27.11 MMT). This represents approximately 46.7% of the theoretical storage capacity of the NBU.

2.3. Geologic Setting

The project site for this MRV Plan is the North Burbank Field, located in Osage County, Oklahoma. See Figure 2 for a general location of Osage County, Oklahoma.

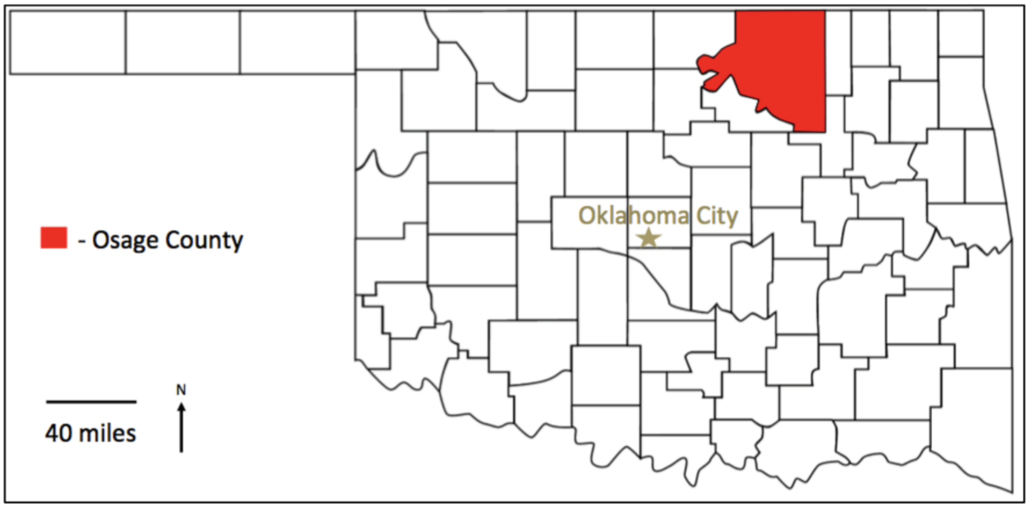

Figure 2 – General Location of Project[3]

The North Burbank Field is a sandstone reservoir that is a large oil trap. The oil producing zone is a large sand body comprised of many overlapping sand bars deposited along the southern shore of the Cherokee sea of Pennsylvania Age. The oil trap is an updip pinch-out of multistoried sands deposited into channels, eroded into underlying marine shales. The overlapping and erosional contact between these channels produced a net effect of a wide, single sand body. Intermittent marine incursions spread the reservoir in an east-west direction, further widening the sand body. The channels have a north-south trend. The reservoir is a well-consolidated sand and is rather strongly oil-wet. It is a Fluvial dominated deltaic (Class 1) reservoir. The reservoir is heterogeneous horizontally and vertically.[4] The Cherokee platform is a province with a relatively stable geologic history.[5]

The Burbank Sandstone includes the Red Fork and Bartlesville formations. "The Bartlesville and Burbank sands are so similar in composition and physical characteristics that they cannot be differentiated with certainty."[6] For convenience, this MRV Plan will refer to the Burbank Sandstone, the Red Fork formation and the Bartlesville formation collectively as the "reservoir". At the Burbank Field, the reservoir is about 3,000 feet below the surface, located in Ranges 5E-6E and Townships 26N-27N in Osage County, Oklahoma. The Burbank Field is 12 miles long, 4.5 miles wide, and trends in a southeast-northwest

[3] West (2015).
[4] Lorenz (1986).
[5] West (2015); Kleinschmidt (1976).
[6] Leatherock (1937).

direction. The sand is largely composed of fine- and medium-grained quartz cemented with silica, dolomite, ankerite and calcite.

The Burbank Field was discovered in 1920. The Burbank Field is located in western Osage County, in north-central Oklahoma (see Figure 3). The Burbank Field is approximately 25 miles east of Ponca City, Oklahoma, and 60 miles northwest of Tulsa, Oklahoma, as indicated by the red dot in Figure 3.

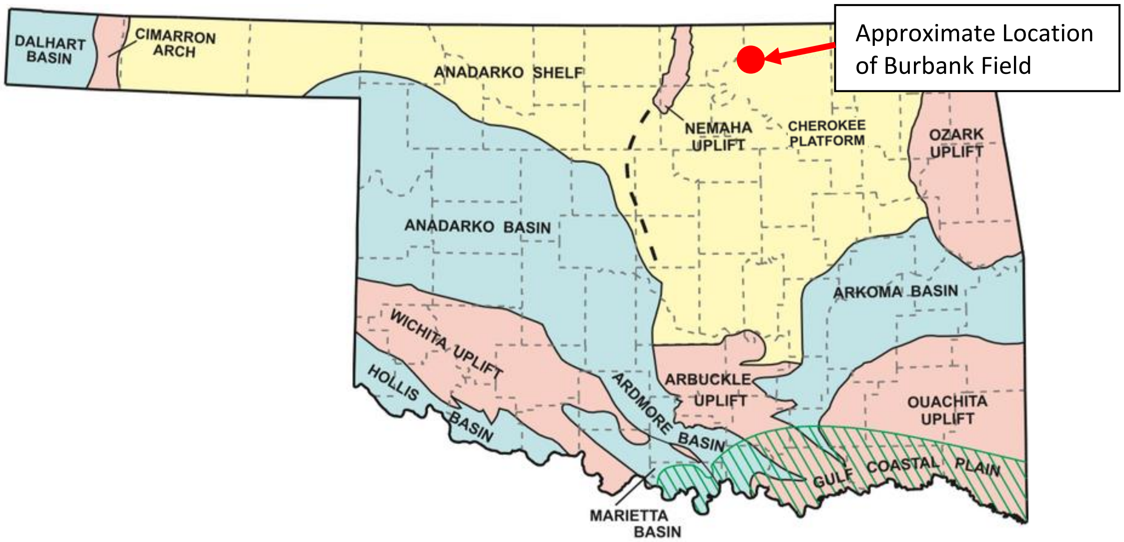

Figure 3 – Paleogeographic Map of Oklahoma[7]

As shown in Figure 3, Osage County, and the NBU, is bound to the east by the Ozark Uplift, and to the west by the Nemaha Uplift. In Osage County, regional dip of the strata is to the west-southwest.[8]

The Burbank Field is one of the largest oil fields in the United States and has approximately 824 million barrels of Original Oil In Place (OOIP). Since first discovered in the 1920s, the Burbank Field has produced approximately 360 million barrels of oil, or 39% of the OOIP. The reservoir has been buried underneath thick layers of impermeable rock. Over time, subsurface elevations within the reservoir have become uneven, creating variations in elevations and relatively higher subsurface elevations in locations such as the Burbank Field where oil and natural gas have accumulated.

The reservoir (highlighted in green in Figure 4 on page 6) now lies beneath approximately 3,000 feet of overlying sediments. There are numerous formations above the reservoir that are impermeable and serve as reliable barriers to prevent fluids from moving upwards towards the surface. These barriers, or "seals", effectively seal fluids into the formation(s) beneath them. In the Burbank Field, the first seal is the Pink Limestone member of the Cabaniss formation in the Cherokee Group. Above this lie over 10 additional intervals of impermeable rock layers of various thicknesses, including the Verdigris Lime, the "Big Lime" and the Avant/Iola Lime formations or members. These formations and members are highlighted in brown in Figure 4 (on page 6).

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[7] Villalba (2016).
[8] West (2015).

Depth	System	Series	Group	Formation	Member
	Quaternary	Quaternary	Alluvium & Terrace		
	Permian	Leonardian	Sumner	Wellington	
		Wolfcampian	Chase	Oscar	
			Council Grove	Vanoss	Red Eagle Lime
50'				Sand Creek	Foraker Lime
			Admire Group		Admire Shale
~200'	Pennsylvanian	Virgilian	Wabaunsee	Ada	Campbell, Ragan, Crews and Ebert Sands
				Pawhuska	Burlingame Lime
					Newkirk Sand
~725'			Shawnee	Elgin	Pawhuska (Deer Creek) Lime
~900'					Hoover, Elgin, and Carmichael Sands
~1000'				Nelagoney (Vamoosa)	Oread Lime
~1150'					Endicott & Lovell Sands
			Douglas		Haskell Lime
~1400'					Fourmile, Cheshewalla, Revard, Bigheart and Tonkawa Sands
		Missourian	Ochelata		Wildhorse Lime
`1700'				Barnsdall	Okesa Sand (Suitcase Sands)
					Lane-Vilas Shale
				Torpedo	Torpedo Sand
				Wann	Clem Creek (Perry Gas) Sand
~1875'				Iola	Avant/Iola Lime
					Muncie Creek Shale
					Paola (Loula) Lime
~1950'				Chanute	Osage Layton (Cottage Grove) Sand
			Skiatook	Dewey Lime	Dewey/Drum Limestone
				Nellie Bly	Cherry Vale Shale
					Layton (Shell Creek), Mussellem and
					Hogshooter (Dennis) Limestone
~2250'				Coffeyville	True Layton (Dodd Creek) Sand
~2400'					Checkerboard Lime
~2450'				Seminole	Cleveland Sands
		Desmoinesian	Marmaton	Holdenville	
					Memorial Shale
				Lenapah	Lenapah Lime
				Nowata	Nowata Shale
					Altamont Lime
					Bandera Shale
~2490'				Oologah	Big Lime (Pawnee Lime)
~2575'				Labette	Labette (Cherokee) Shale
~2625'				Fort Scott Lime	Oswego Lime
			Cherokee	Cabaniss (Senora, Boggy Savanna)	Little Osage, Excello and Oakley Shales
~2750'					Prue (Squirrel) Shale and Sand
					Verdigris Lime
~2865'					Skinner and Sonner Sands
~2890'					Pink or "Hot Pink" Lime
~3000'				Krebs	Burbank (Red Fork and Bartlesville) Sands
					Brown Lime
					Penn Shales
~3030'	Mississippian	Osagean	Boone Group		Boone Lime
		Kinderhookian	St. Joe Lime		St. Joe Lime
~3300'	Devonian		Chattanooga (Woodford) Shale		Misener Sand
	Ordovician		Sylvan Group		Sylvan (Maquoketa) Shale
			Viola Group		Viola (Fite) Lime
			Simpson Group		Wilcox Sand
					Tyner Shales and Sands
					Burgen Sand
~3525'	Cambrian		Arbuckle Group		
~3800'			Siliceous Lime		
~3850'			Reagan Sand (Timbered Hills) & Granite Wash		
~4400'	Pre-Cambrian		Spavinaw Granite & Washington County / Rhyolite		

Figure 4 – Generalized Stratigraphic Column for Osage County, Oklahoma (compiled from Keeling (2016); Suneson (2010); West (2015); Jennings (2014); Li (2014); Reeves (1999); Stafford (2014); and Bass (1942)

The Burbank Field includes formations that involve incised valley fill sequences. The geologic depositional model of the Burbank Field is depicted in Figure 5 below.

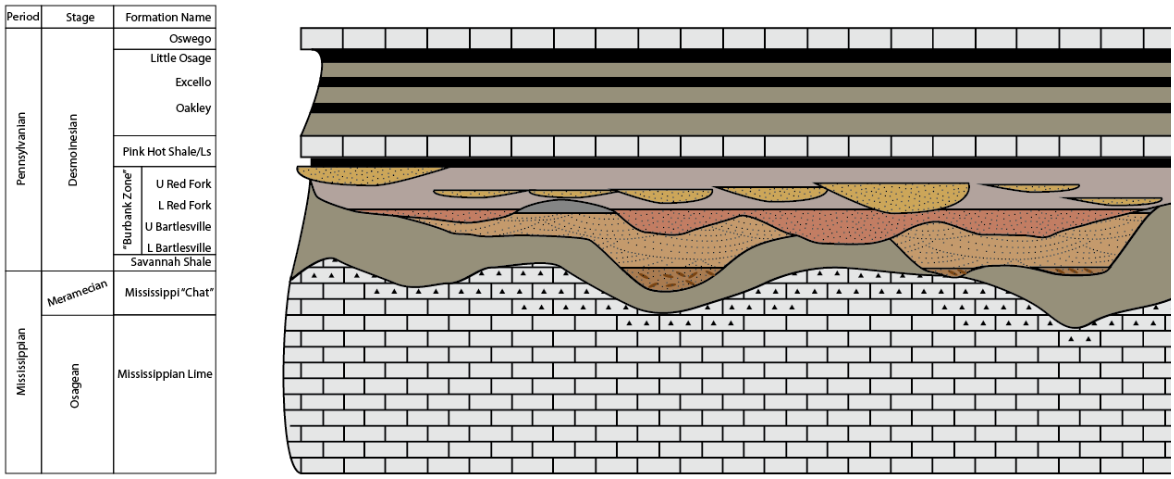

Figure 5 – Geological Depositional Model, NBU

As shown in Figure 5, multiple layers of caprock or "seals" are naturally provided above the reservoir, which is depicted as the "Burbank Zone" in Figure 5. These seal formations include the Hot Pink Limestone and the Oswego Limestone, each of which are impermeable and provide a reliable barrier to prevent injected CO_2 from moving upward towards the surface. These seal layers are depicted as "Marine Shales" in Figure 6 below, and the reservoir or "Burbank Zone" is indicated as "Channel Sandstones" in Figure 6.

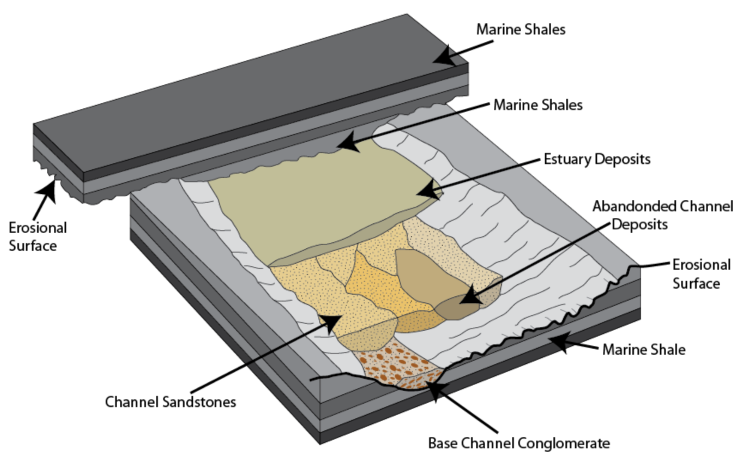

Figure 6 – 3D Rendering of Geological Depositional Model, NBU

Other than as described below, there are no known faults or fractures in the Burbank Field that provide a potential pathway for upward fluid flow. The fact that significant amounts of oil and natural gas have been produced from the reservoir is one confirmation of this fact and is indicative that a good quality natural seal exists. Oil and natural gas tend to migrate upward over time because they are less dense than brine found in various rock formations. Locations where oil and natural gas have been trapped in

the deep subsurface provide positive proof that faults and fractures do not provide a potential pathway for upward flow of injected CO_2 from the reservoir.

The operating history of the Burbank Field also demonstrates that there are no faults or fractures penetrating the reservoir, other than as described below. Fluids including water, carbon dioxide and polymers have been successfully injected into the NBU since 1950. The reservoir is characterized by east-west jointing, or fracturing, such that the effective permeability in the east-west direction is five times as great as that in the north-south direction. This results in a preferential east-west movement of injected fluids. For this reason, flooding operations in the NBU has generally developed by injecting water in east-west rows of wells and producing alternate rows of wells.[9] CO_2 injection has been similarly initiated, beginning in 2013. CO_2 and water are both injected in the CO_2-EOR portion of the NBU in a water alternating gas (WAG) process, where water is injected for a certain time period, followed by CO_2 for a certain time period, and then repeating the process. Water curtain injection (WCI) described below is the historic method used for decades during the waterflood in the NBU to address the flow of fluids within and external to the NBU unit boundary, and continues to be used during the CO_2-EOR flood operations. Other than as described above, there is no evidence of any interaction with existing or new faults or fractures. The absence of these faults and factures is one of the reasons why the NBU is such a strong candidate for water-flooding and now CO_2-flooding operations.

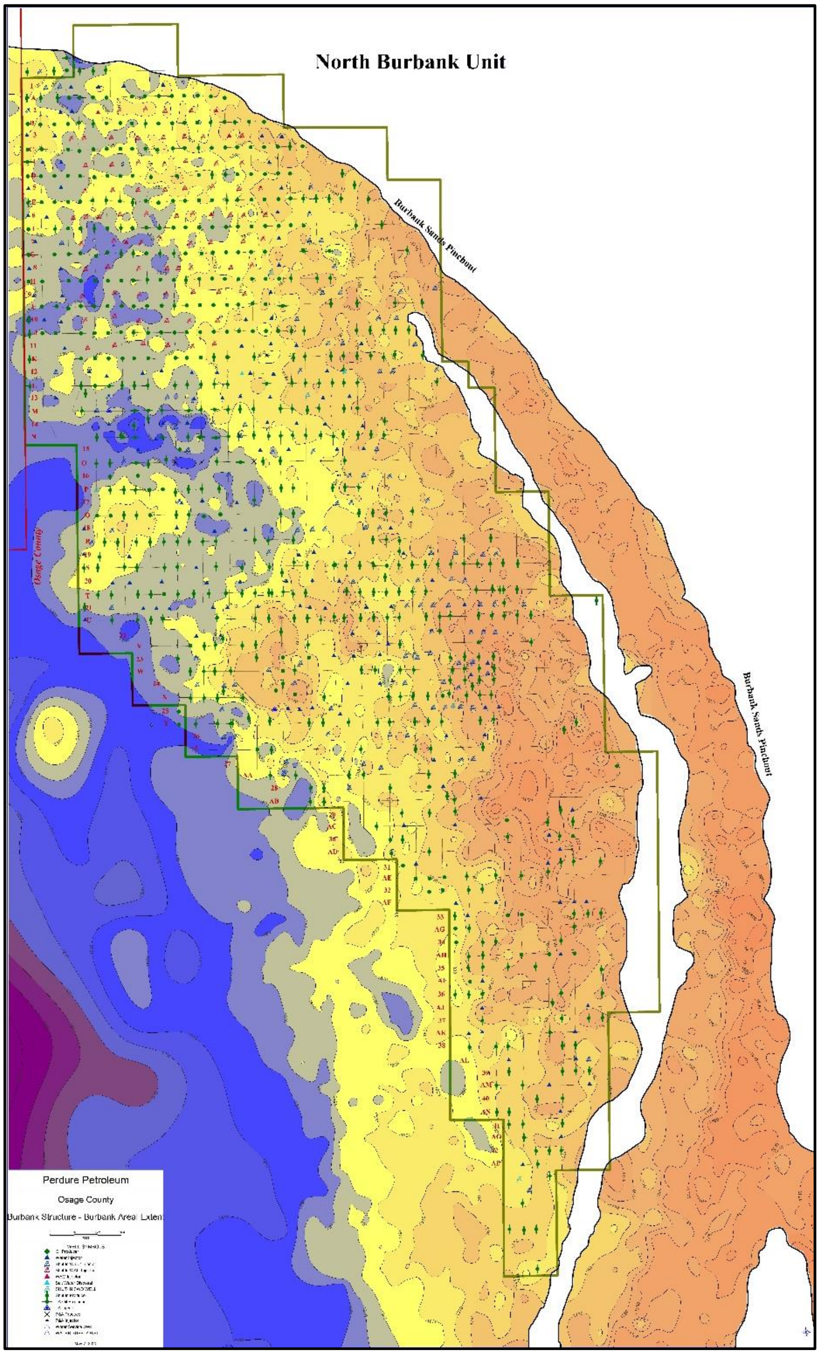

Figure 7 – Structure Map of the Top of the Burbank Sandstone

Figure 7 provides an overhead view of the geologic structure of the reservoir at the NBU, and the colors indicate changes in

[9] Kleinschmidt (1976).

subsurface elevation. In Figure 7 (on page 8), red/orange represents the higher elevations (i.e. the level closest to the surface) and blue/magenta represents the lower elevations (i.e. the level furthest below the surface). In the NBU, the higher elevations of the reservoir are to the east, southeast and south. The north half of the reservoir dips down in elevation to the west.

Buoyancy dominates the interaction of fluids in a reservoir. Gas is the lightest and rises to the top. Water is heavier and sinks to the bottom. Since oil is heavier than gas but lighter than water, it lies in between. Mobile CO_2 that is not miscible with the oil in the reservoir, whether in its gaseous phase or in its dense or supercritical fluid phase, is driven by buoyancy forces and gradually rises upward over time. Fluids including CO_2 and oil rise vertically until reaching the highest elevation in the structure. In the NBU, that highest elevation is to the east. Operationally, the reservoir boundaries of the NBU are maintained with a "water curtain".

Water curtain injection (WCI) is a common operations method in the CO_2-EOR industry involving continuous CO_2 injection in a selected area, with the addition of peripheral continuous water injection (commonly along the oil-water contact). WCI operations are conducted to create a pressure barrier or "curtain" to contain the injected CO_2 within the desired reservoir or rock volume, to focus the injected CO_2 to the area selected for production, to maintain the CO_2 within the confines of a CO_2-EOR project, and to prevent the CO_2 from impacting areas in the reservoir that are not under CO_2 flooding operations. WCI operations are efficient methods of maintaining and controlling lateral migration of fluids to assure that CO_2 does not cross structurally deficient locations.[10]

Active reservoir management is permissible within the NBU unit boundary through the use of WCI operations to manage reservoir pressures of all injected fluids. While WCI operations at certain pressures maintain the injected CO_2 within the WAG area, CO_2 injection operations at certain pressures ensure the water injected via WCI operations does not interfere with active CO_2-EOR operations. WCI operations at the NBU allow pressure maintenance within the reservoir of all injected fluids for harmonized management of the entire reservoir.

Because of the WCI operations employed at the NBU unit boundaries, injected fluids (including CO_2) stay in the reservoir within the NBU unit boundary and do not move to adjacent areas. When water and supercritical CO_2 are injected into an oil reservoir, they are pushed from injection wells to production wells by the high pressure of the injected fluids. WCI operations are only required during dynamic conditions at the NBU such as injection into and production from the reservoir. When active WCI operations conclude, the CO_2 plume will be governed by gravity. When the CO_2-EOR operation is complete and injection of CO_2 is terminated, the injected CO_2 that is not dissolved in the remaining oil or water in reservoir will remain in the reservoir and will rise slowly upward due to buoyancy forces. However, at the NBU, the amount of CO_2 stored in the reservoir at that time will not exceed the secure storage capacity of the NBU reservoir. As explained in Section 2.2 above, the CO_2 stored in the NBU will fill approximately 46.7% of the total calculated storage capacity of the reservoir. As a result, there is more than enough pore space to retain the projected amount of stored CO_2.

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[10] Nunez-Lopez (2017); Davis (2019); Hvorka (2015); Gaines (2009); and APGTF (2002).

Certain attributes of the reservoir are summarized in Table 1 below.

NBU Reservoir Characteristics (historic or current)

Unitized Area, acres	23,240
Area, square miles	~36.3
Depth, feet (average)	~2,900
Thickness, feet (average)	45 – 60
Dip	W-SW @ ~ 0.5^o
Porosity, percent average	16.8 – 22%
Permeability, millidarcies (md)	32 – 313
Water Saturation (Initial)	0.27 – 0.34
Viscosity of Oil, centipoise (cP)	~3
Permeability Variation (Dykstra-Parsons)	0.48 – 0.81
Boi (reservoir volume factor, reservoir bbls/stock)	1.23
Solution GOR (original), cf/STB	472
Reservoir Temperature, ^{o}F	122
API Stock Tank Oil Gravity	~39
Unit OOIP, MMSTBO	824
Fracture Pressure (at MMP), psig	~2,030
Original Reservoir Pressure, psia	1,350
Minimum Miscibility Pressure (MMP) (Slimtube), psia	~1,670
Pattern Size, acres	40
Primary Recovery, %OOIP	~18.1
Secondary Recovery, %OOIP	~20.7
Secondary to Primary Ratio	1.14
Tertiary (technically recoverable), %OOIP	12.6
Cumulative Oil Production, MMSTBO	~320
Cum Tertiary (CO_2-EOR) Production (to date), MMSTBO	3.4
Pore Volume, MM BBL	1,492.3

Table 1 – NBU Reservoir Historic or Current Characteristics

When wells are drilled, a detailed record of the geological formation is prepared either by taking samples through visual inspections or with the aid of measurement instruments lowered into the borehole. This detailed record, known as a well log, provides vital information regarding the rocks, fluids and other characteristics of the geology above, in, and below the target reservoir. Sometimes the drilling of a well also includes obtaining a rock sample (or core) from the wellbore at various elevations or formations. Numerous NBU wells have been drilled, logged and cored. NBU Well Nos. 22-42W and 22-27W are exemplar wells, and their core and log are provided below in Figure 8 (on page 11). Another type well log is for NBU Well No. 33-41W and is provided below in Figure 9 (on page 11).

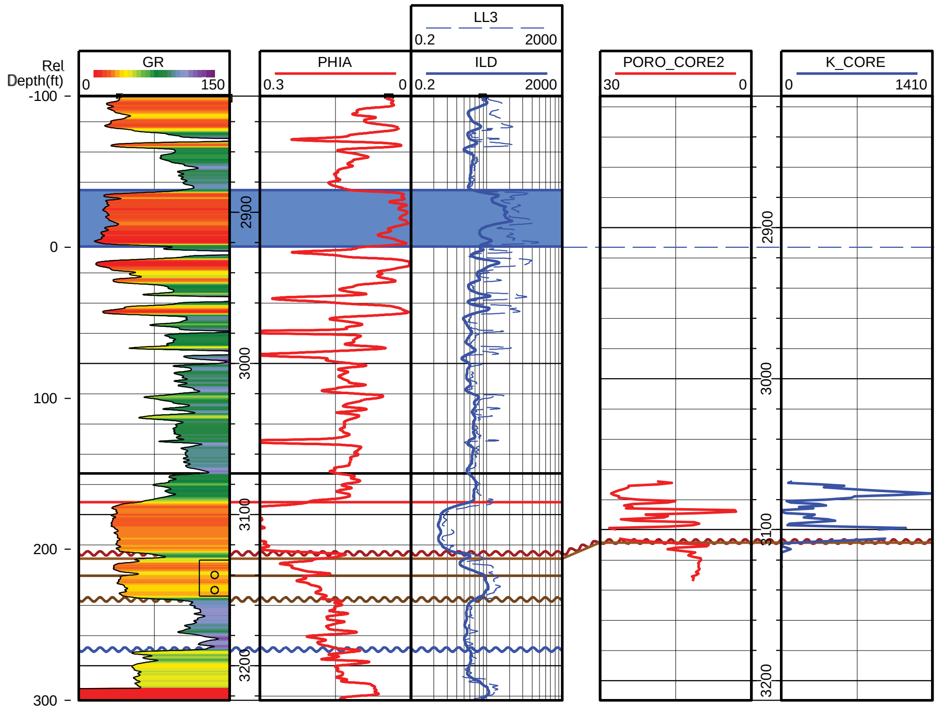

Figure 8 – Exemplar Conventional NBU Well Log and Core

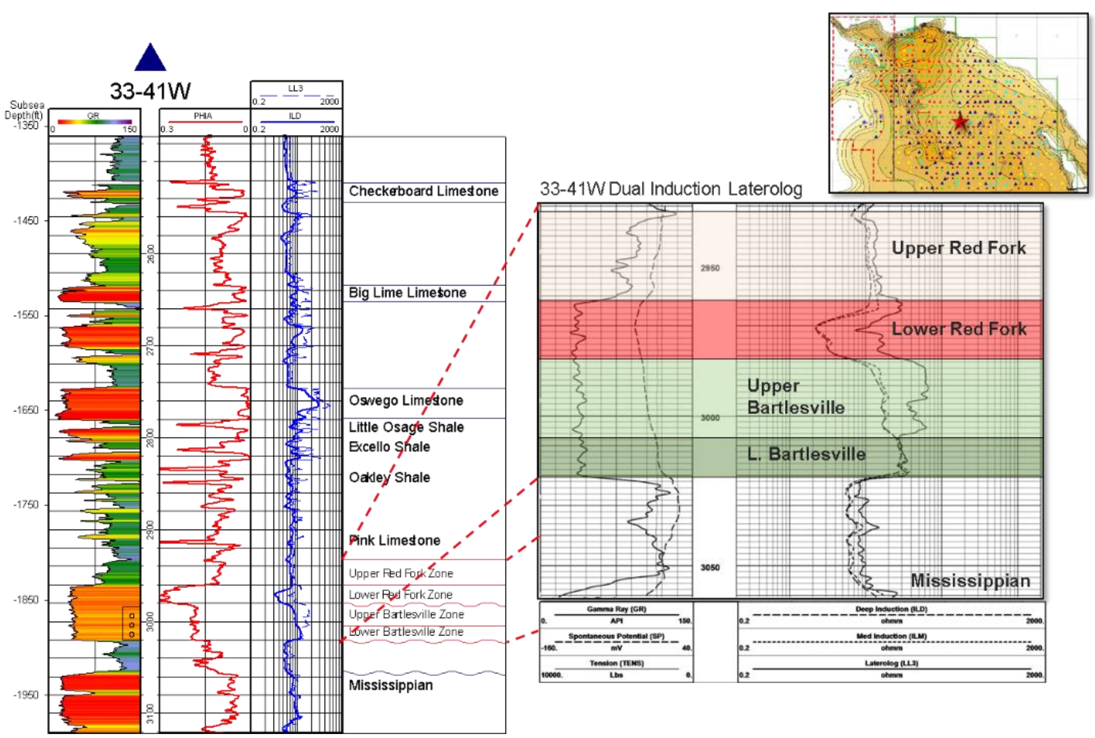

Figure 9 – Type Log of NBU Well

2.4. Operational History[11]

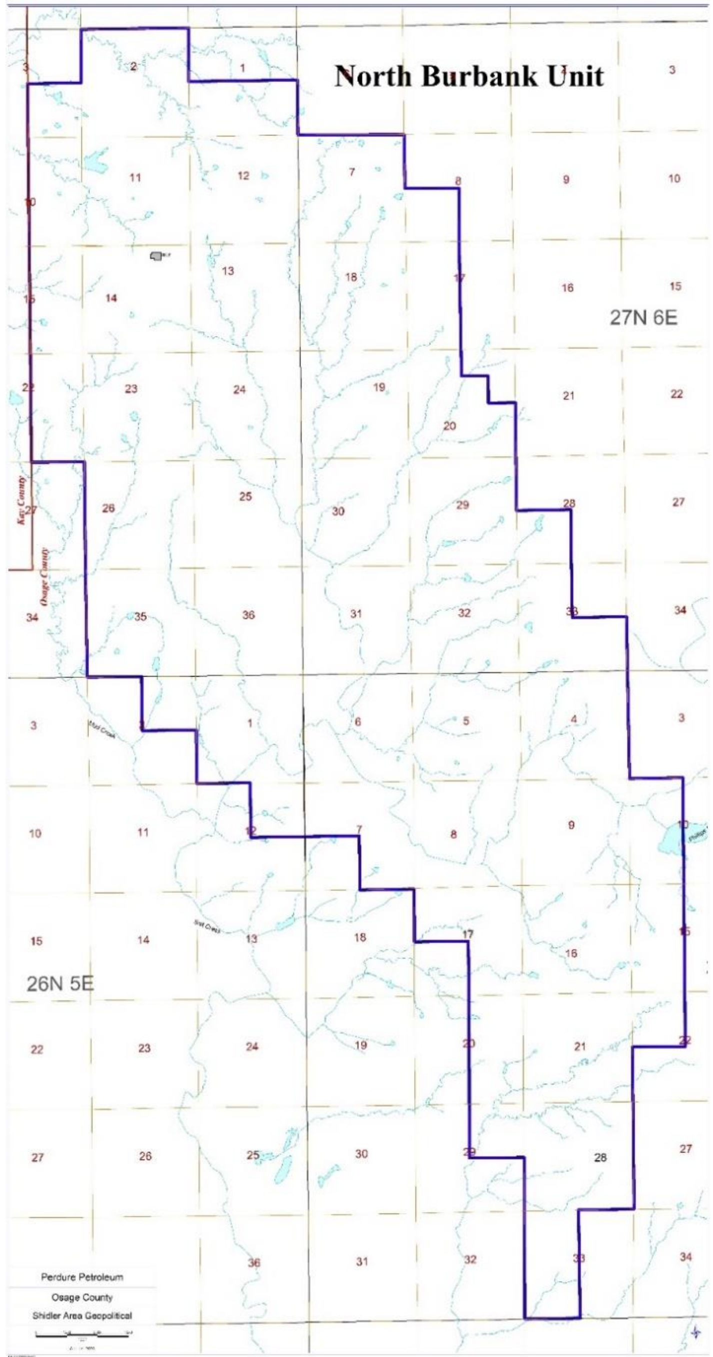

Figure 10 – North Burbank Unit Boundary Map

The Burbank Field in Osage County, Oklahoma, was discovered by the Marland Oil Company in May 1920. The Burbank Field was extended several miles to the southeast when The Carter Oil Company completed the second well in in September 1920. The Burbank Field was developed rapidly. Wells were drilled with cable tools and, upon completion, were produced wide open by flowing, swabbing, or pumping to capacity.[12] The wells were heavily shot upon completion or as soon thereafter as they quit flowing. Peak production of 122,000 barrels of oil per day was reached in July 1923. By 1924, 75% of the wells in the main part of the NBU had been drilled. Production declined rapidly because of the large volume of fluid being produced from the reservoir without any injection support.

The practice of pulling vacuum on wells began in 1924 to increase production. Vacuum was discontinued in 1939. Repressuring was inaugurated on a limited scale in 1926. Repressuring using natural gas purchased from outside the NBU was commenced in 1935 and continued for many years.[13]

The NBU was originally developed by numerous individuals and companies under various separate leases from the Bureau of Indian Affairs (BIA) and the Osage Nation in Osage County. Over time, to improve efficiency, several smaller leases were combined or unitized into larger units which are operated without the operational restrictions imposed by the former lease boundaries. The NBU was formed in 1950. The NBU is the single largest oil recovery unit in the state of Oklahoma. The boundaries of the NBU are reflected in Figure 10.

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[11] Compiled from various reports including Bass Report 10 (1942); Hunter (1956), Li (2014); and Stafford (2014).

[12] "When gushers came in, earthen dikes were used to hold the oil until storage tanks could be built." http://www.tgp-docents.com/docent/osage.html

[13] Hunter (1956).

The NBU was unitized in 1950, coordinating 20 leaseholders with a unitized area of 23,240 acres. The boundaries of the NBU include the small unincorporated town of Webb City, Oklahoma, a booming oil camp in the 1920s, but with a population of less than 50 people today.

When oil was discovered in the Burbank Field in the 1920s, oil was found at the top of the sand in practically all wells, and there is no evidence of an initial gas cap. The reservoir energy was supplied almost entirely by dissolved gas in the oil. This type of oil reservoir offers good waterflooding opportunities.

Waterflooding was initiated in the NBU over a 15-year period beginning in 1949. Waterflooding the NBU was one of the world's largest waterflooding projects at that time.[14] Waterflooding began on the southern portion of the unit and was gradually extended toward the north until 1964 when it reached the northern edge.[15] Initial waterflood design of a 5-spot 20-acre spaced pattern quickly changed to a north-south elongated 5-spot 20-acre pattern developed in alternate east-west rows, accounting for a preferential east-west movement of injected fluid.[16] Phillips Petroleum Company operated the NBU beginning in 1950 upon unitization, and implemented the waterflood.

Starting in 1965, a steam drive pilot was conducted, but results were disappointing.[17] A successful polymer flood pilot test was conducted from August 1970 through 1979 on two particular tracts.[18] In the late 1970s, NBU Tract 97 was part of a multi-year Department of Energy (DOE) surfactant polymer pilot.[19] A commercial scale freshwater polymer flood was conducted in the Webb City area of the NBU beginning in 1980.[20]

CO_2-EOR operations began in the NBU on June 6, 2013 and has continued and expanded since that time. The experience at NBU of operating and refining the waterflood since 1950 and the CO_2-EOR flood since 2013 has created a strong understanding of the reservoir and its capacity to store CO_2.

Phillips Petroleum Company operated the NBU from unitization until November 1995, when Phillips sold the NBU to Calumet Oil Company.[21] Chaparral Energy bought the NBU from Calumet Oil Company on October 31, 2007. The current operator is Perdure Petroleum, which acquired the NBU from Chaparral in November 2017. Perdure Petroleum maintains a 99.25% working interest in the NBU and a 86.85% net revenue interest. The operator also owns significant portions of the surface within the NBU unit boundaries. The Osage Indian Nation owns 100% of the oil and gas minerals in Osage County, including the minerals in the NBU.

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[14] Li (2014); see also Reese, L.W., Loughlin, P., *Main Street Oklahoma: Stories of Twentieth-Century America*, p 106 (2013) ("At the time that it was instituted in 1949, the waterflood project in the North Burbank Field was one of the largest secondary recovery efforts in the history of the petroleum industry.")
[15] Pang (1981).
[16] Hunter (1956).
[17] Trantham (1982).
[18] Pang (1981).
[19] Bradford (1980).
[20] Pang (1981); Moffit (1993).
[21] Westermark (2003).

2.5. Description of Injection Process and Project Facilities

The injection process for the CO_2-EOR operations in the NBU generally consists of three (3) primary processes:

1. CO_2 distribution and injection
2. Injection and production wells
3. Produced fluids handling and gas compression

The CO_2 distribution and injection process begins with receiving CO_2 delivered to the NBU for purposes of injection. The CO_2 delivered to the NBU is supplied by one or more sources, such as CO_2 delivered from the Coffeyville CO_2 Pipeline and CO_2 received from the NBU Recycle Compression Facility (RCF). The delivered CO_2 is then sent through the injection pipeline distribution system to various CO_2 injection wells throughout the NBU.

The produced fluids handling system gathers fluids from the production wells in one or more areas within the NBU. While production wells in the NBU produce a mixture of oil and water fluids, some of the production wells also produce CO_2 or other gases. The mixture of produced fluids (oil, water and CO_2 and other gases) flows to satellite batteries for separation and/or to centralized tank batteries where gases and fluids are separated. The fluids stream is further separated into oil that is sold by truck or pipeline, and water that is recovered for reuse, reinjection or disposal. The gas stream, consisting of CO_2 and other gases, is transported to the RCF.

The produced gas compression process consists of gathering CO_2 and other gases that may be produced from the active CO_2-EOR portion of the NBU, and compressing the CO_2-rich gas stream for ultimate reinjection into the NBU. Currently the RCF is the only facility that performs this function, but additional recycle compression facilities may be installed in the future and would provide the same function. In addition, natural gas liquid (NGL) recovery operations may be installed at the RCF or other recycle compression facilities in the NBU in the future, to separate NGLs from the stream of CO_2 and other gases, and the NGLs would be sold by truck or pipeline.

2.5.1. CO_2 Distribution and Injection

Currently, CO_2 delivered to the NBU for injection is received through many meters. One meter measures the amount of CO_2 at each CO_2 source location. Another meter measures the amount of CO_2 delivered from the Coffeyville CO_2 Pipeline. Other meters measure the amount of CO_2 at the outlet of the NBU RCF compressors, and a central meter (downstream of all RCF compressors) may be installed at the outlet of the RCF. As the NBU is developed for CO_2-EOR purposes, it is anticipated that CO_2 delivered to the NBU for injection may be received through additional meters, such as from additional recycle compression facilities in the NBU or other CO_2 sources of pipeline delivery points.

All CO_2 that flows through the meters is sent through CO_2 injection lines to individual injection wells in the NBU, and in many instances through manifolds and distribution lines prior to arriving at the injection well. Currently, each CO_2 injection well has the ability to inject either CO_2 or water, at various rates and injection pressures, as determined by the EOR operator. A flow meter is used at each injection well to measure the injection rate of the CO_2 (or water, as the case may be). Currently, for any given CO_2 injection well, the CO_2 injected may be sourced from the Coffeyville CO_2 Pipeline, the RCF, or a combination thereof.

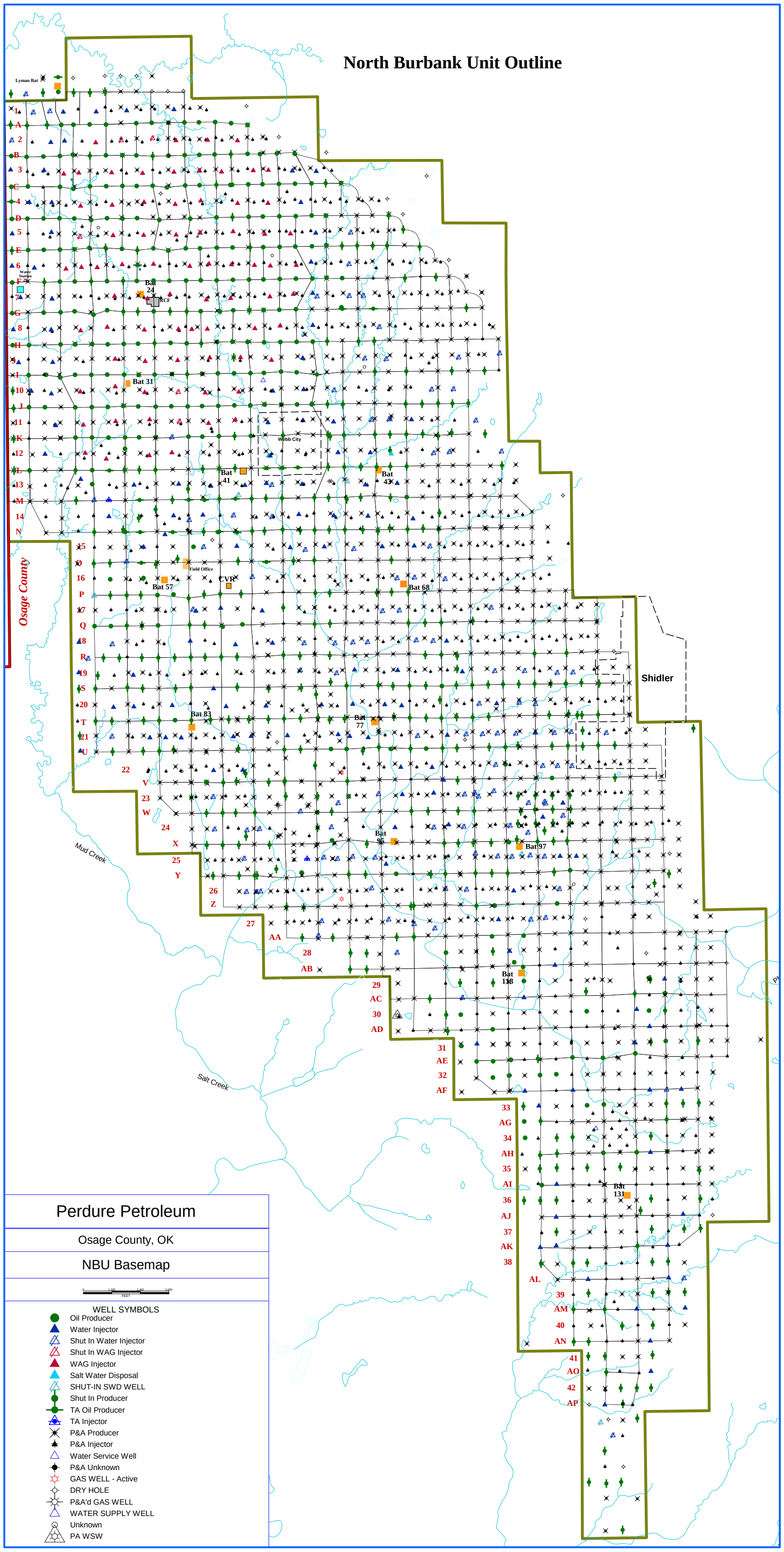

Figure 11 – North Burbank Unit Wells as of January 2020

As of January 2020, about 100 MMSCF/d (5,250 MT) of CO_2 is injected into the NBU each day, of which approximately 45% is from the Coffeyville CO_2 Pipeline and the balance (55%) is recycled CO_2 from the RCF. The ratio of CO_2 sources is expected to change over time, and eventually the percentage of recycled CO_2 will increase, and deliveries of CO_2 from the Coffeyville CO_2 Pipeline will taper off. There are volume meters at the inlet and the outlet of the RCF.

2.5.2. Injection and Production Wells

As of January 2020, there are approximately 451 active completed wells in the NBU. Those wells consist of about 266 production wells, and about 185 injection wells. In addition, there are about 2,394 wells that are not in use, such as being inactive, temporarily abandoned, shut in, or plugged and abandoned. As a result, the total number of wells in the NBU is currently about 2,845 wells. The location of the NBU wells is indicated in Figure 11.

Wells located in Osage County, Oklahoma are regulated by the EPA Region 6 office. The EPA Region 6 granted authority to inject CO_2 into the NBU pursuant to Underground Injection

Control (UIC) permits for the NBU, which state that permit authorization must be obtained from the Bureau of Indian Affairs (BIA) for various activities related to the NBU CO_2-EOR operations. Those permits also state that the base of underground sources of drinking water is 245 feet below the surface. Regulations and/or the permit(s) require that all wells drilled through this interval be cased and cemented to prevent the movement of fluids from the injection zone into another zone or to the surface around the outside of a casing string.

2.5.3. Produced Fluids Handling and Gas Compression

Upon injection of CO_2 or water into the reservoir, a mixture of oil, gas and water (collectively, "produced fluids") is moved towards a production well. Once produced at the production well, the produced fluids are produced into gathering lines that combine, collect and commingle the produced fluids. In the CO_2-EOR portion of the NBU, the produced fluids then flow into a satellite separation facility and then to a battery. Each satellite is equipped with well test equipment to measure production rates of oil, gas and water from individual production wells. In addition, CO_2 and liquids are separated at the satellites. In the portion of the NBU where CO_2 is not injected (waterflood only area), the produced fluids flow directly into a battery. Production in the NBU is from one of the active production wells, which is sent to one of eight batteries (two in the CO_2-EOR area, and six in the waterflood only area). Each battery has a large vessel that performs a gas-liquid separation.

Once any remaining gas and fluids are separated at the batteries in the CO_2-EOR portion of the NBU, the gas phase is transported by pipeline to a recycle compression facility ("RCF") for additional separation and then compression, dehydration and pumping as described below. The average composition of this gas mixture is approximately 95-99% CO_2 and the remaining portion is composed of hydrocarbons, a trace of nitrogen, and hydrogen sulfide (H_2S) at approximately 50-165 parts per million (ppm). This CO_2 concentration is likely to change over time as CO_2-EOR operations continue and expand. The CO_2 at the outlet of the RCF is transported to the injection system described in Section 2.5.1 above.

Produced oil from the NBU is metered through one or more Lease Automatic Custody Transfer (LACT) units located at centralized tank batteries in the NBU, prior to being sold. Currently, the LACT units in the CO_2-EOR portion of the NBU are Tank Batteries 24 and 31. This oil contains a small amount of dissolved or entrained CO_2. A recent sample of oil indicated that the dissolved CO_2 content is approximately 0.26-0.31% by weight in the oil. Any gas that is released from the liquid tanks at Tank Batteries 24 and 31 is collected by one or more Vapor Recovery Units (VRU) that compresses the gas and sends it to an RCF for processing. This gas stream may include trace amounts of CO_2.

The oil produced from the NBU is slightly sour, containing small amounts of hydrogen sulfide (H_2S), which is highly toxic. All field personnel are required to wear H_2S monitors. Although the primary purpose of those monitors is to detect H_2S and protect employees, monitoring of H_2S will also supplement other CO_2 leak detection methods described in this MRV Plan.

2.5.4. Modifications to Project Facilities and Injection Processes

Perdure plans to continue routine business operations in and near the NBU, which may include securing CO_2 from additional sources; changing the status of existing wells, adding new wells, closing wells; deepening existing wells or drilling new wells to a deeper formation for CO_2 injection into that deeper formation; and adding new facility equipment or pipelines. These modifications represent a continuation of the current integrated configuration and MRV approach and are not a material change that would trigger a revised plan required by Section 98.448(d). Any such changes would be indicated in

the annual monitoring report rather than in a new or amended MRV plan. Prior to any CO_2 injection into a deeper formation, Perdure would comply with the statutory and regulatory process for obtaining all necessary permits. New facility equipment additions could include additional recycle compression facilities in the NBU. Any such changes reflected in an annual monitoring report would include, as necessary, a description of how the change is a continuation of the existing project facilities and injection process and would also include any new site characterization, risk assessment, monitoring and mass balance information.

3. Delineation of the monitoring areas and time frames

The current active monitoring area (AMA) as well as future AMA are described below. In addition, the maximum monitoring area (MMA) of the free phase CO_2 plume and its buffer zone are defined below. Also, the monitoring time frames for both the AMA and the MMA are described.

3.1. Active Monitoring Area

Because CO_2 is present in the NBU, and is retained within that area, the current active monitoring area (AMA) is defined by the boundary of the NBU. This boundary is reflected in Figure 10 (on page 12). The following factors were considered in defining this boundary:

- CO_2 is present in the NBU. More than 143.8 BCF (7.58 MMT) of CO_2 has been injected into the NBU since 2013. There has been infill drilling in the NBU to complete additional wells to further optimize production. There has been production of CO_2 in the NBU. Operational results thus far indicate that there is CO_2 in the NBU.

- CO_2 injected into the NBU remains contained within the NBU because of the fluid and pressure management impacts associated with CO_2-EOR operations. Managed lease-line injection and production wells are used to retain fluids in the NBU. Water curtain injection (WCI) operations, described in Section 2.3, have been used for decades in the NBU to retain fluids in the NBU, including the CO_2-EOR portion of the NBU since CO_2 injection began in 2013. There is evidence that operations by the prior EOR operator failed in some instances to maintain the water curtain in the CO_2-EOR area of the NBU as a result of over-producing the western edge of the active CO_2-EOR area and allowing small amounts of injected CO_2 to move outside the west edge of the NBU. Current operations strictly maintain the water curtain so as to prevent such CO_2 migration in the reservoir. Current operational results (such as normal pressures in the injection interval and injection and production rates within predicted ranges) indicate that injected CO_2 is retained in the NBU. Should future WCI operations fail to adequately maintain sufficiently high injection pressures so as to retain injected CO_2 within the CO_2-EOR area of the NBU, it is anticipated that small amounts of injected CO_2 could possibly move outside that area. In that event, Perdure would respond as described in Section 4.6 and Section 5.5.

- Over geologic timeframes, injected CO_2 will remain in the NBU and will not migrate downdip to the western edges of the NBU, because the reservoir in the unit boundary of the NBU is higher in elevation than the reservoir west of the NBU unit boundary. While the reservoir in the Stanley Stringer to the east and northeast of the NBU is higher in elevation than the reservoir in the NBU, water curtain injection (WCI) operations described in Section 2.3 have been used to isolate the Stanley Stringer and the NBU for decades, and will continue to be used. Just as oil and gas were trapped in and contained in the NBU, as demonstrated by the long history of oil and gas production occurring within the NBU, so will the injected CO_2.

As CO_2 injection operations are expanded beyond the currently active CO_2-EOR portion of the NBU into other areas of the NBU, then the AMA is anticipated to expand to include areas within the NBU into which the CO_2 is injected. Such expansions will be reported in the Subpart RR Annual Report for the NBU, as required by Section 98.446.

3.2. Maximum Monitoring Area

The maximum monitoring area (MMA) is defined in Section 98.449 as equal to or greater than the area expected to contain the free-phase CO_2 plume until the CO_2 plume has stabilized, plus an all-around buffer zone of one-half mile. Section 4.1 states that the maximum extent of the injected CO_2 is anticipated to be bounded by the NBU unit boundary. Therefore, the MMA is the NBU plus the one-half mile buffer as required.

3.3. Monitoring time frames

The primary purpose for injecting CO_2 in the NBU is to produce oil that would otherwise remain trapped in the reservoir. The primary purpose for injecting CO_2 in the NBU is not, as stated in UIC Class VI regulations at 40 CFR 146.81(b), "specifically for the purpose of geologic storage." During a Specified Period, there will be a subsidiary or ancillary purpose of establishing the long-term containment of a measurable quantity of CO_2 in the reservoir. The Specified Period will be shorter than the period of oil production from the NBU. This is in part because the delivery of CO_2 for injection from sources other than a recycle compression facility is projected to taper off significantly before oil production ceases in the NBU, which is modeled through 2060. At the conclusion of the Specified Period, a request for discontinuation of reporting under Subpart RR will be submitted. This request will be submitted when it can be demonstrated that then-current monitoring and/or model(s) show that the cumulative mass of CO_2 reported as sequestered during the Specified Period is not expected to migrate in the future in a manner likely to result in surface leakage. It is expected that it will be possible to make this demonstration within three years after injection for the Specified Period ceases. The demonstration will rely on at least the following three principles: (1) the amount of CO_2 stored in any properly P&A'd wells will be considered unlikely to migrate to the surface; (2) the continued process of fluid management during the years of CO_2-EOR operation after the Specified Period will contain injected fluids in the NBU; and (3) the cumulative mass reported as sequestered during the Specified Period is a fraction of the theoretical storage capacity of the NBU.

4. Evaluation of Leakage Pathways

The reservoir in the NBU has been studied and documented extensively for decades, including through the publications listed in Section 12.6. Knowledge gained through the 100+ year history of oil and gas production in the NBU has been used to identify and assess potential pathways for leakage of CO_2 to the surface. The following potential pathways are reviewed below:

- Well bores
- Faults and fractures
- Natural and induced seismic activity
- Prior operations
- Pipeline and surface equipment
- Lateral migration outside the NBU
- Drilling through the CO_2 area

- Diffuse leakage through the seal

4.1. Well Bores

As of January 2020, there are approximately 451 active completed wells in the NBU. About 266 of those wells are production wells and about 185 are injection wells. In addition, there are approximately 2,394 wells not in use that penetrate the reservoir, as described in Section 2.5.2 above. Leakage through existing and future well bores is a potential risk in the NBU that Perdure works to prevent by:

- adhering to regulatory requirements for well drilling and testing
- implementing best practices that Perdure has developed through its extensive operating experience
- monitoring performance of injection and production operations
- monitoring wellbore integrity and surface operations
- maintaining surface equipment

Regulations governing wells in the NBU require that wells be completed and operated so that fluids are contained in the strata in which they are encountered and that well operation does not pollute subsurface and surface waters. The regulations establish the requirements with which all wells must comply, whether they are injection, production or disposal wells. Depending on the purpose of the well, the regulatory requirements can impose additional standards for evaluation of area of review (AOR). CO_2 injection well permits are authorized only after an application, notice and opportunity for a hearing. As part of the application process, Perdure conducts an AOR that includes wells within the NBU and one-quarter mile from the set of wells considered in that AOR. Pursuant to Environmental Protection Agency regulations, all wells within the AOR that penetrated the injection interval were located and evaluated.

Regulatory requirements can also impose additional standards for mechanical integrity testing (MIT). All active injection wells must undergo a periodic MIT, depending on various dates and activities associated with the well. MIT tests include inspection of wells and associated surface facilities to ensure they are in good repair, free of leaks, and conform with various rules and permit conditions. MIT tests also include the use of a pressure recorder and pressure gauge and testing the casing-tubing annulus for a minimum amount of time at a minimum pressure.

In implementing those regulations, Perdure has developed operating procedures based on its experience as a CO_2-EOR operator. Perdure's operations include developing detailed modeling at the pattern level to guide injection pressures and performance expectations, as well as utilizing experts in diverse disciplines to operate EOR projects based on specific site characteristics. Perdure's field personnel are trained to operate wells in a manner to look for and address issues promptly, and to implement corrosion prevention techniques to protect wellbores as needed. Field personnel also are required to wear H_2S detectors and, because H_2S is entrained in the CO_2, the H_2S detector would alarm if field personnel are near equipment that leaked CO_2. Perdure's operations are designed to comply with the applicable regulations and to ensure that all fluids (including oil, water and CO_2) remain in the NBU until they are produced through a Perdure well.

New wells that are drilled into the reservoir are designed to be cemented all the way from the formation to the surface. Figure 12 (on page 20) depicts a diagram of a typical new well drilled in the NBU, and provides an example of well construction showing intervals of cement over crucial formations. As of

January 1, 2020, approximately 17 of the 451 active completed wells have been drilled in this manner, and 100% of the new wells that have been drilled since Perdure took over operations of the NBU in 2017 have been drilled in this manner.

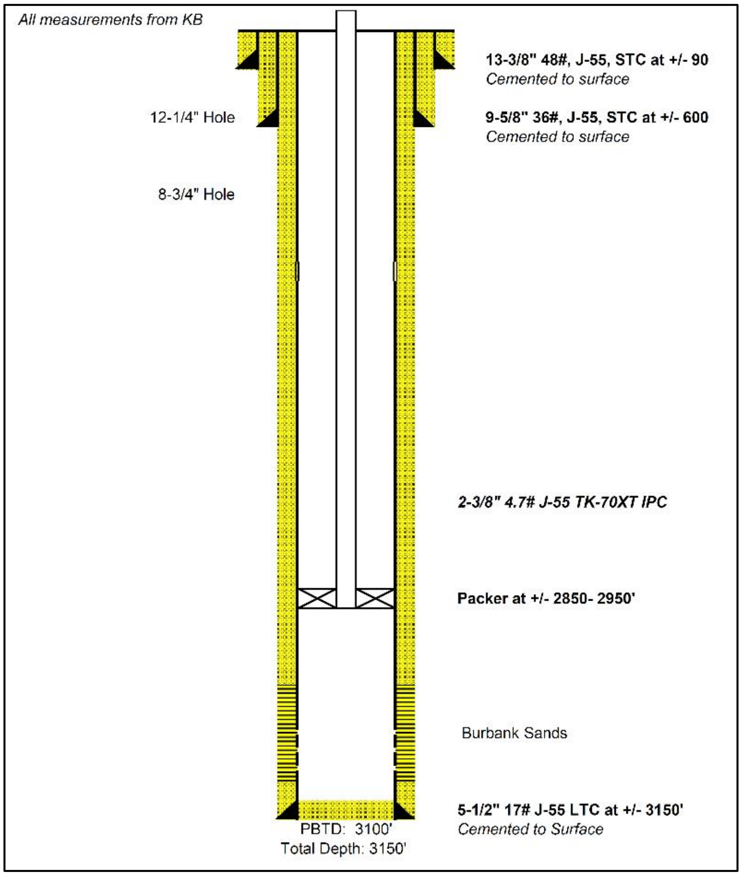

Figure 12 – Typical New Drill Well Bore Diagram

Well pressure in injection wells is monitored on a continual basis. The injection plans for each pattern are programmed into the injection WAG satellite, as discussed in Section 6.4, to govern the rate, pressure, and duration of either water or CO_2 injection. Pressure monitors on the injection wells are programmed to flag pressures that significantly deviate from the plan. Leakage on the inside or outside of the injection wellbore would affect pressure and be detected through this approach. If such excursions occur, they are investigated and addressed. It is the company's experience that few excursions result in fluid migration out of the intended zone and that leakage to the surface is very rare.

In addition to monitoring well pressure and injection performance, Perdure uses the experience gained over time to strategically approach well maintenance and updating. Perdure maintains well maintenance and workover crews onsite for this purpose. For example, well classifications by age and construction method inform Perdure's plan for monitoring and updating wells. Perdure uses all of the information at hand including pattern performance, and well characteristics to determine well maintenance schedules.

Production well performance is monitored using the production well test process conducted when produced fluids are gathered and sent to a satellite battery. There is a routine cycle for each satellite battery, with each well being tested approximately once every two months. During this cycle, each production well is diverted to the well test equipment for a period of time sufficient to measure and sample produced fluids (generally 8-12 hours). This test allows Perdure to allocate a portion of the produced fluids measured at the satellite battery to each production well, assess the composition of produced fluids by location, and assess the performance of each well. Performance data are reviewed on a routine basis to ensure that CO_2 flooding is optimized. If production is off plan, it is investigated and any identified issues addressed. Leakage to the outside of production wells is not considered a major risk because of the reduced pressure in the casing. Also, personal H_2S monitors are designed to detect leaked H_2S around production wells.

Field inspections are conducted on a routine basis by field personnel. On any day, Perdure has approximately 32 personnel in the field in the NBU, as of January 2020. Leaking CO_2 is very cold and leads to formation of bright white clouds or dry ice, either of which is easily spotted. All field personnel are trained to identify leaking CO_2 and other potential problems at wellbores and in the field. Any CO_2 leakage detected will be documented and reported, quantified and addressed as described in Section 5.

Continual and routine monitoring of well bores and site operations will be used to detect leaks, as further described in Section 6.1. Based on these activities, Perdure will mitigate the risk of CO_2 leakage through existing well bores by detecting problems as they arise and quantifying any leakage that does occur. Section 5 summarizes how CO_2 leakage from various pathways will be monitored and responded to. Section 6 describes how any such leakages will be input into the mass-balance equation.

4.2. Faults and Fractures

Other than as described in Section 2.3 above, there are no known faults or fractures in the reservoir that provide a potential pathway for upward fluid flow. Locations where oil and natural gas have been trapped in the deep subsurface provide positive proof that faults and fractures do not provide a potential pathway for upward flow of injected CO_2 from the reservoir. As described in Section 2.3, the reservoir is characterized by east-west fracturing, which results in a preferential east-west movement of injected fluids. This fact led to early adjustments of the waterflood in the 1950s, and all flooding operations since that time. The waterflood and the CO_2-EOR operations in the NBU is generally developed by injecting water/CO_2 in east-west rows of wells and producing alternate rows of wells. Water curtain injection (WCI) described in Section 2.3 is the historic method used for decades during the waterflood in the NBU to address the flow of fluids within and external to the NBU unit boundaries, and continues to be used during the CO_2-EOR flood operations. Other than as described above, there is no evidence of any interaction with existing or new faults or fractures.

Perdure has extensive experience in designing, implementing and operating EOR projects to ensure that injection pressures will not damage the oil reservoir by inducing new fractures or creating shear. Injection pressures are monitored so that injection pressures will not exceed fracture pressures, even if injection well permits authorize injection pressures that exceed fracture pressures.

4.3. Natural and Induced Seismic Activity

There is no direct evidence that natural seismic activity poses a significant risk for loss of CO_2 to the surface in the NBU.

Determining whether seismic activity is induced, or triggered by human activity, is difficult. In the past 10-15 years, north central Oklahoma has experienced a significant increase in earthquakes. This increase is depicted in Figure 13 (on page 22), which show the earthquake densities in Oklahoma prior to 2009, and then again from 2009-2018. Osage County is outlined in blue, and there are very few if any of these recent earthquakes in Osage County.

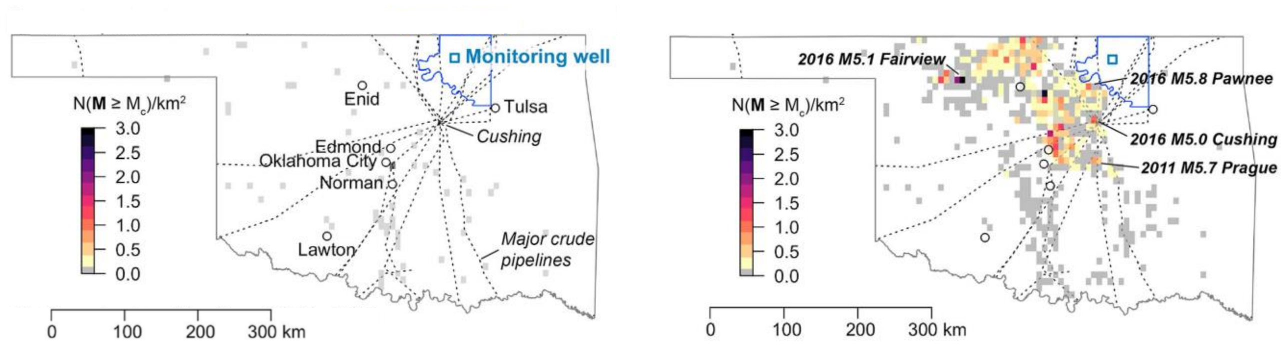

Figure 13 – Oklahoma Earthquake Densities: Prior to 2009 (left) and 2009 – 2018 (right)[22]

Over the past 10-15 years, the Cherokee Platform in north central Oklahoma was targeted by many oil and gas companies for horizontal shale oil drilling. Many of these production wells, including those from the Mississippi Limestone formation, yielded significant volumes of saltwater along with the hydrocarbons, and the produced saltwater was commonly disposed of into deeper formations such as those in the Arbuckle Group. Injection of this produced saltwater into the Arbuckle, which directly overlies crystalline basement rock in areas outside the NBU, has been proposed to perturb the stresses on basement faults, causing them to slip and contributing to at least some increased density of earthquakes. "The majority of the observed earthquakes [from 2009 to 2016] were traced to the crystalline basement."[23]

However, Osage County has a much different experience to report:

> "An Oklahoma seismicity map shows Osage County as an anomalously "quiet" region. Seismicity in counties surrounding Osage County experienced hundreds of earthquakes during the past couple of years, yet the area of Osage experienced less than a dozen earthquakes in the decades-long history of the Oklahoma seismic network."[24]

In a recent study focused on the injection of produced saltwater in Osage County into the Arbuckle formation, the study agreed that Osage County is a "seismically quiet location with a high density of active disposal wells".[25] The study also demonstrates that the Arbuckle is more thick on the western edge of Osage County where the NBU unit boundary is located, and is less thick both to the east and to the west of the western edge of Osage County,[26] indicating that western Osage County (and the NBU area) has a lower seismic risk than the surrounding area related to injection into the Arbuckle.

In some instances of induced seismic activity in Oklahoma over the past 15 years, the water was injected into a saline aquifer formation immediately above or very near the basement rock. However, as a recent study noted, the details of how the Arbuckle contacts with the Precambrian basement rock tends to vary spatially.[27]

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[22] Barbour (2019).
[23] Kibikas (2019).
[24] Crain (2017).
[25] Barbour (2019).
[26] Barbour (2019).
[27] Barbour (2019).

Documented instances of induced seismicity have not been reported within the NBU boundary. A primary reason is demonstrated in Figure 4 (on page 6), which shows that the reservoir into which the water (and now CO_2) is approximately 3,000 feet deep, but the basement granite is located half again as deep, at approximately 4,400 feet. The reservoir into which the CO_2 is injected (the Burbank) is well above the basement rock. During the specified period, Perdure's injection of CO_2 into the reservoir within the NBU unit boundary will not involve injection into a formation immediately above or near the basement rock.

Perdure is injecting CO_2 into the Burbank reservoir, which is shallower than the deeper Arbuckle formation. Perdure is not injecting CO_2 into the Arbuckle formation. The injection of CO_2 by Perdure into the reservoir within the NBU is not only for EOR purposes but also for the additional purpose of maintaining pressures in the reservoir as other fluids are produced from the reservoir. This is a very different operation than injecting produced water to constantly increase pore pressure.

Controlled high pressure injection of water into the reservoir has been ongoing since 1949 without any documented instances of induced seismicity. This history of over 70 years of injection into the reservoir tends to demonstrate the low seismic risk associated with reservoir operations.

Since 2014, the State of Oklahoma's Coordinating Council on Seismic Activity (CCSA) has organized state resources and other activities related to increased seismic activity in the State, and provides collaboration among interested stakeholders including industry, regulators, academia, non-governmental organizations, and environmental-focused associations. The CCSA shares data, studies, developments, and proposed actions related to earthquakes in Oklahoma. The State of Oklahoma maintains one of the nation's most robust seismic monitoring systems, and that system (along with actions taken by regulators and industry participants) has resulted in a dramatic decrease in the incidence of significant earthquakes in Oklahoma. This is shown in four separate figures in Section 12.4, showing the increase and then the decrease in the number of significant earthquakes in the geographic area around and including the NBU. This trend of induced seismic activity demonstrates that actions taken in recent years have significantly reduced the risk of earthquakes caused by injection of produced water into the Arbuckle formation – none of which involves the NBU unit boundary geographic area, and none of which involves the reservoir which is approximately 1,400 less deep compared to the Arbuckle formation.

Section 12.4 demonstrates that, since 1980, the nearest earthquake to the NBU was south of White Eagle, Oklahoma, approximately 25 miles from the NBU. The nearest large earthquake was in Pawnee, Oklahoma in 2016, which is nearly 35 miles away from the NBU. Perdure is not aware of any reported loss of CO_2 or water to the surface in the NBU associated with any seismic activity.

A concern about induced seismicity is that it could lead to fractures in the seal, providing a pathway for CO_2 leakage to the surface. However, the subject wells injecting produced wastewater into the Arbuckle formation are injecting fluids at approximately 3,500 feet deep, which is about 500 feet lower than the reservoir in the NBU that contains the injected CO_2. Moreover, there have been no reports of loss of injectant (wastewater or CO_2) to the surface associated with any seismic activity.

Therefore, there is no direct evidence to suggest that natural seismic activity poses a significant risk for loss of CO_2 to the surface from the NBU. If induced seismicity resulted in a pathway for material amounts of CO_2 to migrate from the injection zone, then other reservoir fluid monitoring methods (such as reservoir pressure, well pressure and pattern monitoring) would lead to further investigation.

4.4. Prior Operations

In 2013, CO_2 flooding began in the NBU. Perdure and prior operators have maintained records of the NBU, including active and abandoned wells. Perdure's standard practice in drilling new wells includes a review of records to ensure that drilling will not cause damage to any nearby active or abandoned well. AOR requirements include identification of all active and abandoned wells in the AOR, and implementation of procedures to ensure integrity of active wells. Perdure and prior operators have checked for the presence of old, unknown wells throughout the NBU over many decades. These practices ensure that identified wells are sufficiently isolated and do not interfere with the CO_2 injection, enhanced oil recovery, and reservoir pressure maintenance operations. This operational experience supports the conclusions that there are no unknown wells within the NBU and that the risk of migration from older wells has been sufficiently mitigated. To Perdure's knowledge, no prior operations have impaired the CO_2 injection confining zone.

4.5. Pipeline and Surface Equipment

Leakage of CO_2 through pipelines and surface equipment in the NBU is a potential risk. The risk of unplanned losses of CO_2, including damage to or failure of pipelines and surface equipment, is reduced to the maximum extent practicable through the use of prevailing design and construction practices, routine maintenance, periodic inspection procedures as well as maintaining compliance with applicable regulations. The facilities and pipelines currently utilize and will continue to utilize materials of construction and control processes that are standard for CO_2-EOR projects in the oil and gas industry. Operating and maintenance practices currently follow and will continue to follow demonstrated industry standards. In addition, Perdure's field operations include frequent routine visual inspection of surface facilities, which will provide an additional way to detect leaks and further support Perdure's efforts to detect and remedy any leaks in a timely manner. Finally, amounts of CO_2 lost through this potential leakage pathway will be determined by: (a) following the Subpart W Methodology Approach described in Section 5.5 below; (b) using direct metering to measure specific venting events, and (c) using engineering best practices to estimate a loss in the rare event of an extreme event.

4.6. Lateral Migration

There is a potential risk of injected CO_2 in the NBU migrating in the reservoir to an area outside the unit boundary of the NBU. However, as described in Section 2.4, the NBU waterflood design was adjusted in the 1950s to account for a preferential east-west movement of injected fluid in the reservoir. For many decades, the injection pattern in the NBU has been a north-south elongated 5-spot 20-acre pattern on alternating east-west rows. Currently, the CO_2-EOR area of the NBU is operated on 5-spot 40-acre injection patterns, with alternating east-west rows of injectors and producers. This operations method has successfully maintained injected water and CO_2 in the reservoir within the NBU unit boundary. Because Perdure has no intentions of changing this operational injection pattern, this risk of lateral migration is significantly reduced.

Water curtain injection (WCI) methods are also deployed during CO_2-EOR operations to prevent CO_2 lateral migration out of the unit boundary. As described in Section 2.3, continuous WCI operations are conducted at the NBU unit boundaries to create a pressure barrier to contain injected fluids within the NBU. WCI operations efficiently and effectively maintain and control lateral migration of fluids to assure that the CO_2 does not cross NBU unit boundaries. CO_2 injection and production operations are conducted based on lessons learned from prior operations and provide added measures of protection against any potential leakage of CO_2 from the reservoir. An earlier operator's over production of the western water curtain, described in Section 3.1, demonstrates the importance of managing WCI operations in the NBU. Upon assuming ownership of the NBU in 2017, Perdure modified the CO_2 injection and production operations to prevent over production of the water curtain on the NBU's western edge, which is downdip in the reservoir. Due to Perdure's WCI operations at the NBU unit boundaries, injected fluids (including CO_2) are maintained in the reservoir within the NBU unit boundary and do not move to adjacent areas, much like how operations were successfully conducted during decades of the waterflood (1950s-2013). As a result, it is unlikely that injected CO_2 will migrate downdip and laterally outside the NBU because of the nature of the geology and Perdure's approach used for injection. Should such leakage occur, Perdure plans to determine the most appropriate methods for quantifying the volume leaked, which would likely include measured or engineering estimates of relevant parameters (e.g. CO_2 flow rate, concentration, duration), and will report it as required as part of the annual Subpart RR submission.

4.7. Drilling Through the CO_2 Area

There is a risk, albeit small, that future drilling through the Burbank formation could occur and inadvertently create a leakage pathway. However, the risk is very low because of regulatory requirements, routine inspections, and operational drivers. EPA UIC regulations regarding Class II injection wells require that any fluids be contained in strata in which they are encountered.[28] In addition, Perdure's visual inspection process is designed to identify unapproved drilling activity in the NBU, especially where Perdure owns substantial portions of the surface estate. Finally, Perdure plans to conduct CO_2-EOR operations in the NBU for decades and inherently has a commercial interested in protecting the integrity of its assets and maximizing resources.

4.8. Diffuse Leakage Through the Seal

In the NBU, for CO_2 injected into the reservoir, the natural seal is the Pink Limestone member of the Cherokee formation. Diffuse leakage of the injected CO_2 through the seal is highly unlikely and improbable.

The seal is composed of several feet of salt, shale and tight carbonate. The seal is highly impermeable where unperforated, and the seal is cemented across in any horizons where the seal is perforated by wells. If CO_2 were to migrate through the seal, it would be encountered and trapped by the secondary seal which is the Oswego Limestone member of the Marmaton formation, or any of the additional shallower seals indicated in brown in Figure 4 (on page 6).

Oil and gas production in the NBU from the reservoir also confirms the successful trapping of fluids by the seal over geologic time. The natural seal is the reason the reservoir exists in the first place. Additional pressure monitoring and geo-mechanical modeling of the seal in the NBU also confirms the efficiency and integrity of the confining system.

In addition, each CO_2 injection well is assigned a maximum surface injection pressure by the EPA. This limitation is imposed as part of the EPA UIC permitting process and has the purpose of ensuring that the reservoir fracture pressure is not exceeded.

Additionally, geo-mechanical analyses were conducted using wireline logs and core tests for certain wells in the NBU. Analytical techniques were used to estimate changes in minimum horizontal stress, σh, caused by changes in pressure and temperature during CO_2 injection, and to determine whether the stress state compromises the ability of the reservoir for safe and effective CO_2 storage. It was found

[28] 40 CFR § 146.22(b)(1).

that fracturing of the reservoir or caprock is not likely, as long as the injection pressure is maintained below the EPA UIC permit pressure limit.

5. Monitoring

5.1. Monitoring Generally

As part of its ongoing operations, Perdure monitors and collects flow, pressure, temperature, and gas composition data from wells and facilities in the NBU, and stores that information in the company's data management system. Some information is collected electronically by equipment connected to a supervisory control and data acquisition (SCADA) system, while other information is collected manually by operations personnel physically present at the well or facility. Meters are used throughout the NBU for measurement purposes. However, accuracy of meters – even though installed, operated, maintained and calibrated according to industry standards – are inherently suspect due to variances between meters, such as factor settings, meter calibrations, operation conditions, elevation differences, changes in temperature during a day, pressure changes over short time periods, and fluid composition differences (especially in multi-component or multi-phase flows). The NBU includes 439 active completed injection and production wells, and a comparable number of meters, each with an acceptable range of error. This is a site-specific factor that is considered in the mass balance calculations described in Section 7.

Leakage detection for the NBU facilities includes visual inspection of wellheads and surface facilities, injection well monitoring, and Mechanical Integrity Tests (MIT). Some of the potential leakage pathways include surface equipment and wells. Detection monitoring program techniques include visual inspections, pipeline inspections, gas alarms, personal H_2S monitors, and MITs. Areas that are monitored for such leaks include the area from the injection flow meter to the injection wellhead, and from that wellhead to the injection formation. Detection of CO_2 from these potential leakage pathways are described in Section 5.2 through Section 5.5 below. While faults, fractures, formation seal and lateral migration could be additional leakage pathways, the likelihood of such leaks are highly improbable, as described in more detail in Sections 4.2, 4.6, and 4.8 above.

5.2. CO_2 Received

The amount of CO_2 received will be calculated using one or more custody-transfer meters at the point at which custody of the CO_2 is transferred to the NBU. Currently, the sole source of CO_2 received by the NBU is CO_2 from the Coffeyville CO_2 Pipeline. These custody transfers are commercial transactions that are documented. CO_2 composition is governed by the contract, and the CO_2 is periodically sampled to determine composition. Perdure uses flowmeters for measurements at custody transfer locations, and these flowmeters measure flow rate continually. Any additional CO_2 received into the NBU would be measured using similar flowmeters. No CO_2 is currently received in containers.

5.3. CO_2 Injected

The amount of injected CO_2 is calculated using the flow meter volumes at the operations meters at the outlet of the numerous compressors at the RCF, and each of the meters at each CO_2 off-take point from a CO_2 source (currently there is only one such off-take point, the Coffeyville CO_2 Pipeline).

5.4. CO_2 Produced, Entrained and Recycled

CO_2 produced is calculated using flowmeters at the production satellites and any flowmeters at the inlet of the RCF. For purposes of reporting under Subpart RR, Perdure will measure the mass of CO_2

produced through these volumetric flowmeters. For any new production facilities that may be added in the NBU (as indicated in Section 2.5.4), the mass of CO_2 produced would similarly be measured using one or more volumetric flowmeters.

CO_2 is produced as entrained (or dissolved) CO_2 in produced oil. As the oil passes through low-pressure separation to a gathering tank, a small amount of the CO_2 is released. The mass of this amount of CO_2 will be determined as described in Section 7.3 below.

Recycled CO_2 is calculated as CO_2 that is produced from the NBU, recaptured, and reinjected into the NBU. Recycled CO_2 is calculated using the flowmeters on the downstream side of the RCF.

5.5. CO_2 Emitted by Surface Leakage

Perdure uses an event-driven process to assess, address, track and (if applicable) quantify potential CO_2 leakage to the surface. The multi-layered, risk-based monitoring program for event-driven incidents has been designed to meet two objectives, in accordance with the leakage risk assessment in Section 4: (1) to detect problems before CO_2 leaks to the surface; and (2) to detect and quantify any leaks that do occur. Section 5.5.1 through Section 5.5.3 (below) discuss how this monitoring will be conducted and used to quantify the volumes of CO_2 leaked to the surface.

The emissions from the field associated with the NBU have historically not met or exceeded the Subpart W reporting threshold. Because Perdure believes this historical trend will continue, Perdure does not anticipate reporting under Subpart W for the field associated with the NBU. In the event emissions from the field associated with the NBU trigger a reporting requirement under Subpart W, Perdure will comply with Subpart W regulations. For purposes of this MRV Plan, certain Subpart W methodologies will be utilized for certain emission calculations regardless of whether Subpart W reporting is required by regulation. We call this the Subpart W Methodology Approach, which is referenced throughout this MRV Plan. Perdure will reconcile any results of the Subpart W Methodology Approach[29] and results from any event-driven quantification to assure that surface leaks are not counted multiple times.

5.5.1. Monitoring for Potential Leakage from the Injection/Production Zone

Perdure monitors both injection into, and production from, the reservoir as a means of early identification of potential anomalies that could indicate leakage of CO_2 from the subsurface. The following surface data is routinely tracked and reported on a daily basis: injection rate (barrels of water, MCF of CO_2), production rates (barrels of oil, barrels of water, MCF of CO_2), tubing pressure (psig), casing pressure (psig), wellhead temperature (°F), and runtime (hours). At certain locations, instruments exist that collect data more frequently, but most if not all of that information is reduced to daily totals or averages which is a standard and custom in the oil and gas industry. The collected information is used

[29] As part of the Subpart W Methodology Approach, certain monitoring and QA/QC procedures specified in Subpart W will be used to estimate surface leaks from equipment in the NBU. Subpart W uses a factor-driven approach to estimate equipment leakage. Perdure evaluates and estimates leaks from equipment, the CO_2 content of produced oil, and vented CO_2 – including for CO_2 emitted from equipment leaks and vented emissions of CO_2 from surface equipment located between (a) the injection flowmeter and the injection wellhead, and (b) the production flowmeter and the production wellhead. See Section 7.5 below.

primarily for operational oversight and monitoring of CO_2-EOR projects, but it is intended that this data also be used to determine when additional investigation is warranted of any potential CO_2 leakage.

Perdure uses reservoir modeling based on extensive history-matched data, as well as permit conditions and operational performance of CO_2-EOR operations by the prior operator and by Perdure, to develop daily and/or monthly injection rates, pressures, and volumes for each injection well. If injection pressure or rate measurements exceed specified set points determined as part of each pattern injection plan, then a flag is automatically generated, and operations personnel will investigate and resolve the matter. These anomalies are reviewed by operations personnel, and may include engineering personnel, to determine if CO_2 leakage is occurring. These kinds of anomalies are not necessarily indicators of leaks. Instead, they may simply indicate that injection rates and pressures are not conforming to the pattern injection plan. In many cases, flagged conditions present problems are straightforward to remedy, such as recalibration of a meter or some other minor action, and there is no threat of CO_2 leakage. If the issue is not readily resolved, a more detailed investigation is initiated, and additional Perdure personnel and perhaps industry support would provide additional assistance and evaluation. If a leak occurs, Perdure would quantify its magnitude.

In addition to developing daily and/or monthly injection plans, Perdure also uses collected data to forecast production volumes of oil, water and CO_2, both as to produced volumes and composition. Production wells are assigned to a satellite test facility and are isolated once every quarter for a daily well production test. Such tests are conducted more frequently if overall production or individual well pressure data call for it, or if fewer production wells are assigned to a particular satellite test facility. Production and test data is reviewed on a periodic basis. If there is a significant deviation from past performance or forecast, then operations and engineering personnel will investigate the matter further. If the cause of the deviation cannot be resolved or understood quickly, then a more thorough investigation would be initiated. If a leak to the surface occurs, Perdure would quantify its magnitude.

If leakage in the reservoir or flood zone were detected, Perdure would deploy methods to quantify the volume of CO_2 involved. One possible method could be the use of material balance equations based on known injected quantities, and monitored pressures in the reservoir, to estimate the magnitude of the CO_2 involved.

If there is a subsurface leak of CO_2, it might not lead to a surface leak of CO_2. In the event of a subsurface CO_2 leak, Perdure would select an appropriate approach for tracking subsurface leakage to determine and quantify CO_2 leakage to the surface. To quantify CO_2 leakage to the surface, an estimate of the relevant parameters would be deployed, including the rate, concentration, and duration of the leakage. Depending on specific circumstances, these determinations may rely on engineering estimates.

In the event leakage from the subsurface occurred diffusely through the seals up to the surface, then the leaked gas would include H_2S, which would trigger the alarm on the personal monitors worn by field personnel. In the event such a leak was detected, operations and engineering personnel would determine how to address the problem. The team might use modeling, engineering estimates and direct measurements to quantify the leakage and otherwise address the matter.

5.5.2. Monitoring of Wellbores

Perdure monitors wells through continual, automated pressure monitoring in the injection zone (as described in Section 4.1), monitoring of the annular pressure in wellheads, and routine maintenance and inspection. In the event a wellbore does not sufficiently satisfy a mechanical integrity test (MIT) then the wellbore is shut-in until a satisfactory repair in implemented such as a workover. When the repair is made, another MIT is performed and upon satisfying that test, operations on the wellbore are resumed upon receipt of any necessary regulatory approval to re-establish operations again.

Leaks from wellbores would be detected through the follow-up investigation of pressure anomalies, visual inspection, or the use of personal H_2S monitors.

Anomalies in injection zone pressure may not indicate a leak, as discussed in Section 5.5.1 above. However, if an investigation is initiated, Perdure personnel and perhaps industry support would inspect the equipment in question and determine the nature of the problem. If it is a simple matter, the repair would be accomplished, and the volume of leaked CO_2 would be included in the Subpart W Methodology Approach. If a more extensive repair is needed, then Perdure would determine the appropriate approach for quantifying leaked CO_2 using the relevant parameters (e.g., the rate, concentration, and duration of leakage).

Anomalies in annular pressure or other issues detected during routine maintenance inspections would be treated in a very similar manner. The equipment in question would be inspected for the purpose of determining the nature of the problem. For simple matters, the repair would be made at the time of inspection and the volume of leaked CO_2 would be included in the Subpart W Methodology Approach. If a more extensive repair is needed, then Perdure would determine the appropriate approach for quantifying leaked CO_2 using the relevant parameters (e.g., the rate, concentration, and duration of leakage). One approach that would be considered is to prorate the most recently daily volume of CO_2 involved, compared against the number of hours CO_2 leaked from the system.

Because leaking CO_2 at the surface is very cold and leads to formation of bright white clouds and ice that are easily spotted, Perdure also employs a visual inspection process in the general area of the NBU to detect unexpected releases from wellbores. One aspect of the visual inspection process is that operations personnel visit NBU surface facilities on a routine basis. Such inspections may include tank volumes, equipment status and reliability, lube oil levels, pressures and flow rates in the facility, valve leaks, checking that injectors are on the proper WAG schedule and observing the facility for visible CO_2 or fluid line leaks. In the event a repair is necessary, the time to repair any leak is dependent on several factors, such as the severity of the leak, available manpower, location of the leak, and availability of materials required for the repair. Critical leaks are acted upon immediately.

In addition, Perdure uses data collected by H_2S monitors which are worn by all field personnel as a last method to detect leakage from wellbores. The H_2S monitors' detection limit is 10 ppm. If an H_2S alarm is triggered, the first response is to protect the safety of the personnel, and the next step is to safely investigate the source of the alarm. As noted previously, Perdure considers H_2S as a proxy for potential CO_2 leaks in the field. As a result, detected H_2S leaks will be investigated to determine and, if needed, quantify potential CO_2 leakage.

5.5.3. Other Potential Leakage at the Surface

Perdure will utilize the same visual inspection process and H_2S monitoring system to detect other potential leakage at the surface as it does for leakage from wellbores. Perdure utilizes routine visual inspections to detect significant loss of CO_2 to the surface. Operations personnel routinely visit surface facilities to conduct a visual inspection. Inspections may include review of tank levels, equipment status, lube oil levels, pressures and flow rates in the facility, valve leaks, ensuring that injectors are on the proper WAG schedule, and conducting a general observation of the facility for visible CO_2 or fluid line leaks. If a problem is detected, operations personnel would investigate and, if maintenance is required, perform the maintenance or supervise a work crew to perform the maintenance. In addition to the visual inspections, the results of the personal H_2S monitors worn by operations personnel will be a supplement for smaller leaks that may escape visual detection. If CO_2 leakage to the surface is detected, it will be reported to an operations personnel supervisor who will review the report and conduct a site investigation. If maintenance is required, operations personnel will perform the maintenance or supervise a work crew to perform the maintenance. The amount of any CO_2 leakage would be quantified.

5.6. Metering

Perdure follows industry standard metering protocols for custody transfers, such as those standards for accuracy and calibration issued by the API, the American Gas Association (AGA), and the Gas Processors Association (GPA), as appropriate. This approach is consistent with Section 98.444(e)(3). These meters are maintained routinely, operated continually, and will feed data directly to the centralized data collection systems. CO_2 composition is governed by contract and the CO_2 is routinely and periodically sampled to determine average composition. These custody meters provide an accurate method of measuring mass flow.

In addition to custody transfer meters, various process control meters are used in the NBU to monitor and manage in-field activities, many times on a real-time basis. These operations meters provide information used to make operational decisions but are not intended to provide the same level of accuracy as the custody-transfer meters. The level of precision and accuracy for operational meters currently satisfies the requirements for reporting in existing UIC permits. Although these meters are accurate for operational purposes, it is important to note that there is some variance between most commercial meters (on the order of 1-5%) which is additive across meters. This variance is due to differences in factory settings and meter calibration, as well as the operating conditions within the NBU or any given field. Meter elevation, changes in temperature (over the course of the day), fluid composition (especially in multi-component or multi-phase streams), and pressure can affect readings of these operational meters. Unlike some CO_2 injection operations where there are likely to be only a few injection wells and associated meters, the CO_2-EOR operations in the NBU as of January 2020 involves 451 active completed wells and a comparable number of meters, each with an acceptable range of error. This is a site-specific factor that is considered in the mass balance calculations described in Section 7.

5.7. Leakage Verification

If there is a report or indication of a CO_2 leak, such as from a visual inspection, monitor, or pressure drop, a Perdure employee or supervisor will be dispatched to investigate the leak. Emergency shutdown systems will be utilized as necessary to isolate the leak. If the leak cannot be located without movement of equipment or other substantial work, further involvement of Perdure personnel or management will be involved to make a determination regarding how the leak will be located. Once the leak is located and isolated, pressure from the system will be relieved so that further investigation of the leak area can be performed, and repair work can be estimated and ultimately performed.

5.8. Leakage Quantification

Leakage of CO_2 on the surface will be estimated once leakage has been detected and confirmed. Leakage quantification will consist of a methodology selected by Perdure. Leakage estimating methods may potentially consist of modeling or engineering estimates based on operating conditions at the time of the leak, such as temperatures, pressures, volumes and hole size.

5.9. Demonstration at End of Specified Period

At the end of the Specified Period, Perdure intends to cease injecting CO_2 for the subsidiary or ancillary purpose of establishing the long-term storage of CO_2 in the NBU. After the end of the Specified Period, Perdure anticipates that it will submit a request to discontinue monitoring and reporting. The request will demonstrate that the amount of CO_2 reported under Subpart RR "is not expected to migrate in the future in a manner likely to result in surface leakage".[30]

At that time, Perdure will be able to support its request with years of data collected during the Specified Period as well as one to three (or more, if needed) years of data collected after the end of the Specified Period. This demonstration will provide the information necessary for the EPA Administrator to approve the request to discontinue monitoring and reporting. This demonstration may include, but is not limited to:

1) An assessment of CO_2 injection data for the NBU, including the total volume of CO_2 injected and stored as well as actual surface injection pressures;
2) An assessment of any CO_2 leakage detected, including discussion of the estimated amount of CO_2 leaked and the distribution of emissions by leakage pathway; and
3) An assessment of reservoir pressure in the NBU that demonstrates that the reservoir pressure is stable enough to demonstrate that the injected CO_2 is not expected to migrate in a manner to create a potential leakage pathway.

6. Determination of Baselines for Monitoring CO_2 Surface Leakage

Perdure intends to use the results of daily monitoring of field conditions, operational data (including automatic data systems), routine testing, and maintenance information to identify and investigate excursions from expected performance that could indicate CO_2 leakage, and to otherwise monitor for surface leakage. In the event any of those results identify an issue where a CO_2 leak has occurred, the event will be documented, and an estimate will be made of the amount of CO_2 leaked. The event and estimate will be included in the annual RR reporting. Records of each event will be kept on file for a minimum of 3 years. The methods that Perdure intends to use include the following:

6.1. Data System.

Perdure uses onsite management and SCADA data to conduct its CO_2-EOR operations. Perdure uses data from these efforts to identify and investigate variances from expected performance that could indicate CO_2 leakage. Some CO_2 meters are installed with SCADA systems, that transmit data from the meters automatically into a data warehouse. That data, as well as other operational data collected manually, is also used for operational management and controls.

6.2. Visual Inspections.

Perdure's field personnel conduct routine weekly if not daily inspections of the NBU facilities, wells and other equipment (such as vessels, piping, and valves). These visual inspections provide an opportunity to identify issues early and to address them proactively, which may preclude leaks from happening

[30] Section 98.441.

and/or minimize any CO_2 leakage. Any visual identification of CO_2 vapor emission or ice formation will be reported and documented, and a plan will be developed and executed to correct the issue.

6.3. Personal H_2S Monitors.

All field personnel are required to wear H_2S monitors which, when alarmed at 10 ppm, trigger an immediate response to make sure that personnel are not at risk (and to verify that the monitor is working properly). Any alarm of an H_2S monitor will indicate a release of CO_2, which will be reported and documented, and a plan will be developed and executed to correct the issue.

6.4. Injection Target Rates and Pressures.

Perdure manages its CO_2-EOR operations by developing and implementing target injection rates and pressures for each CO_2 injection well. These target rates and pressures are developed based on various parameters such as historic and ongoing pattern development, WAG operations, CO_2 availability, field performance, and permit conditions. Field personnel implement the WAG schedule by manually making choke adjustments at each injection well, allowing for a physical inspection as described in Section 6.2 of the injection well during each adjustment. Typically on a daily basis, injection rates for each CO_2 injection well are reported and compared to the target rates. Injection pressures and casing pressures are monitored using SCADA equipment on each CO_2 injection well. Injection rates or pressures falling outside of the target rates or pressures to a statistically significant degree are screened to determine if they could lead to CO_2 leakage to the surface. If that screening or investigation identifies any indication of a CO_2 leakage to the surface in this manner, it will be reported and documented, and a plan will be developed and executed to correct the issue.

6.5. Production Wells.

Perdure forecasts the amount of fluids (e.g. oil, water, CO_2) that is likely to be produced from each production well in the NBU over various periods of time. Evaluation of these produced volumes, along with other data, informs operational decisions regarding management of the CO_2-EOR project, and aid in identifying possible issues that may involve CO_2 leakage. These evaluations can direct engineering and/or operational personnel to investigate matters further. If that investigation identifies that a CO_2 leak has occurred, it will be reported and documented, and a plan will be developed and executed to correct the issue.

6.6. Continuous Plant and Pipeline Monitoring.

Perdure currently owns and operates the sole CO_2 supply for the NBU, including the associated CO_2 capture, compression and dehydration facility and the CO_2 pipeline. The facility includes a monitoring program that monitors the rates and pressures at the facility and on the pipeline on a continuous basis. High and low set points are established in the program, and operators at the plant, pipeline and/or NBU are alerted if a parameter is outside the allowable window. If the flagged parameter is the delivery point on the pipeline, but no other parameter at the plant or pipeline is flagged, then the NBU field personnel are alerted so that further investigation can be conducted in the field to determine if the issue poses a leak threat.

6.7. Well Testing.

On a periodic (and in many instances an annual) basis, the NBU injection wells are leak tested for Mechanical Integrity Testing (MIT) as required by the EPA. This consists of regular monitoring of the tubing-casing annular pressure, and conducting a test that pressures up the well and wellhead to verify the well and wellhead can hold the appropriate amount of pressure. Perdure personnel monitor the pressure, and conduct the tests, in accordance with regulations and permit requirements. In the event of a loss of mechanical integrity, the subject injection well is immediately shut-in and an investigation is initiated to determine what caused the loss of mechanical integrity. If investigation of an event identifies that a CO_2 leak has occurred, it will be reported and documented, and a plan will be developed and executed to correct the issue.

7. Determination of CO_2 Volumes Stored Using Mass Balance Equations

The locations for obtaining volume data for the equations in Section 98.443 are proposed to be modified. The following subsections describe how Perdure will calculate the mass of CO_2 injected, emitted, and stored in the NBU.

7.1. Mass of CO_2 Received

Equation RR-2 will be used to calculate the mass of CO_2 received from each delivery point at the NBU ("Mass of CO_2 Received"). The volumetric flow at standard conditions will be multiplied by the CO_2 concentration and the density of the CO_2 at standard conditions to determine mass.

$$\mathrm{CO}_{2T,r} = \sum_{p=1}^{4}\left(Q_{r,p} - S_{r,p}\right) * D * C_{CO_2,p,r} \qquad \text{(Equation RR} - 2\text{)}$$

where:

$CO_{2T,r}$ =	Net annual mass of CO_2 received through flow meter r (metric tons)
$Q_{r,p}$ =	Quarterly volumetric flow through a receiving flow meter r in quarter p at standard conditions (standard cubic meters)
$S_{r,p}$ =	Quarterly volumetric flow through a receiving flow meter r that is redelivered to another facility without being injected into a NBU well in quarter *p* (standard cubic meters)
D =	Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682
$C_{CO_2,p,r}$ =	Quarterly CO_2 concentration measurement in flow for flow meter r in quarter p (vol. percent CO_2, expressed as a decimal fraction)
p =	Quarter of the year
r =	Receiving flow meter(s)

All delivery of CO_2 to the NBU is currently used within the NBU and not redelivered outside of the NBU, so quarterly flow redelivered, $S_{r,p}$, will be reported as zero ("0") during the time period of that operation. Quarterly CO_2 concentration measurement, $C_{CO_2,p,r}$, will be taken.

Equation RR-3 will be used to sum to total Mass of CO_2 Received.

$$CO_{2,RE} = \sum_{r=1}^{R} CO_{2T,r} \qquad \text{(Equation RR} - 3)$$

where:

$CO_{2,RE}$ = Total net annual mass of CO_2 received (metric tons)
$CO_{2T,r}$ = Net annual mass of CO_2 received (metric tons) as calculated in Equation RR-2 for flow meter r
r = Receiving flow meter(s)

7.2. Mass of CO_2 Injected into the Subsurface

The Mass of CO_2 Injected into the Subsurface in the NBU will be determined by Equation RR-6 as modified to be the sum of (1) the Mass of CO_2 Recycled as described below and (2) the Mass of CO_2 Received as determined in Section 7.1 above.

Equation RR-5 will be used to calculate the Mass of CO_2 Recycled using measurements taken from the volumetric flow meter(s) located on the downstream side of the RCF. Using data from these meters will be more accurate than using data at each injection well, because the latter would give an inaccurate estimate of total injection volume due to the large number of injection wells and the potential for propagation of error due to allowable calibration ranges for each meter. The Mass of CO_2 Recycled is determined as follows:

$$CO_{2,u} = \sum_{p=1}^{4} Q_{p,u} * D * C_{CO_2,p,r} \qquad \text{(Equation RR} - 5)$$

where:

$CO_{2,u}$ = Annual CO_2 mass injected as measured by flow meter(s) u (metric tons)
$Q_{p,u}$ = Quarterly volumetric flow rate measurement for flow meter(s) u in quarter p at standard conditions (standard cubic meters per quarter)
D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682
$C_{CO_2,p,u}$ = CO_2 concentration measurement in flow for flow meter(s) u in quarter p (vol. percent CO_2, expressed as a decimal fraction)
p = Quarter of the year
u = Flow meter(s)

The Mass of CO_2 Injected is the sum of (1) the Mass of CO_2 Recycled (Equation RR-5 above) and (2) the Mass of CO_2 Received (described in Section 7.1 above):

$$CO_{2,I} = CO_{2,u} + CO_2 \qquad \text{(Equation RR} - 6\text{)}$$

where:

$CO_{2,I}$ = Annual CO_2 Mass Injected (metric tons)
$CO_{2,u}$ = Annual CO_2 mass injected as measured by flow meter u (metric tons)
CO_2 = Total net annual mass of CO_2 received (metric tons)

7.3. Mass of CO_2 Produced

The Mass of CO_2 Produced in the NBU will be determined by using measurements from (1) the flow meters at the production satellites and any meters at the inlet to the RCF and (2) the custody transfer meters for oil sales. As with injection well data, using the data at each production well would give an inaccurate estimate of the total mass of CO_2 produced due to the large number of wells and the potential for propagation of error due to allowable calibration ranges for each meter.

Equation RR-8 (as modified) will be used to calculate the mass of CO_2 produced from the production wells (other than the mass of CO_2 entrained in produced oil).

$$\mathrm{CO}_{2,w} = \sum_{p=1}^{4} Q_{p,w} * D * C_{CO_2,p,w} \qquad \text{(Equation RR} - 8\text{)}$$

where:

$CO_{2,w}$ = Annual CO_2 mass produced through meter(s) w (metric tons)
$Q_{p,w}$ = Volumetric gas flow rate measurement for meter(s) w in quarter p at standard conditions (standard cubic meters)
D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682
$C_{CO_2,p,w}$ = CO_2 concentration measurement in flow for meter(s) w in quarter p (vol. percent CO_2, expressed as a decimal fraction)
p = Quarter of the year
w = Flow meters

Equation RR-9 (as modified) is used to aggregate (1) the flow meters at the production satellites or any meters at the inlet to the RCF and (2) the custody transfer meters for oil sales.

$$\mathrm{CO}_{2,\mathrm{P}} = \sum_{w=1}^{W} CO_{2,w} + X_{oil} \qquad \text{(Equation RR} - 9\text{)}$$

where:

$CO_{2,P}$ =	Total annual CO_2 mass produced through all meters in the reporting year (metric tons)
$CO_{2,w}$ =	Annual CO_2 mass produced through meters w in the reporting year (metric tons)
X_{oil} =	Mass of entrained CO_2 in oil in the reporting year, measured utilizing commercial meters and electronic flow measurement devices at each point of custody transfer, with such mass of CO_2 calculated by multiplying the total volumetric rate by the CO_2 concentration
w =	Flow meters

7.4. Mass of CO_2 Emitted by Surface Leakage

The total annual Mass of CO_2 Emitted by Surface Leakage will be calculated and reported using an approach that is tailored to specific leakage events. Potential leakage events in a variety of settings are identified in other portions of this plan. Estimates of the mass of CO_2 Emitted by Surface Leakage will likely depend on a number of site-specific factors, including measurements, engineering estimates, emission factors, source of the leakage, nature of the leakage, and other factors. The process for quantifying leakage will entail using state of the art engineering principles or emission factors or both. It is not possible to predict in advance the types of leaks that may or will occur. However, some approaches to quantification are described in Section 5.1 above. In the event of a Surface Leakage, the mass of CO_2 Emitted would be quantified and reported, and the records would be maintained that describe the methods used to estimate or measure the Mass of CO_2 Emitted by Surface Leakage. In addition, information from the Subpart W Methodology Approach will be taken into consideration, and will be reconciled to ensure that surface leakage of CO_2 emissions is not double counted. Equation RR-10 will be used to calculate the Mass of CO_2 Emitted by Surface Leakage:

$$\mathrm{CO}_{2,\mathrm{E}} = \sum_{x=1}^{X} CO_{2,x} \qquad \text{(Equation RR} - 10\text{)}$$

where:

$CO_{2,E}$ =	Total annual CO_2 mass emitted by surface leakage in the reporting year (metric tons)
$CO_{2,x}$ =	Annual CO_2 mass emitted at leakage pathway x in the reporting year (metric tons)
x =	Leakage pathway

7.5. Mass of CO_2 Sequestered

Equation RR-11 is used to calculate the Mass of CO_2 Sequestered in subsurface geologic formations in the reporting year.

$$\mathrm{CO_2} = CO_{2,I} - CO_{2,P} - CO_{2,E} - CO_{2,FI} - CO_{2,FP} \quad \text{(Equation RR} - 11\text{)}$$

where:

- CO_2 = Total annual CO_2 Mass Sequestered in subsurface geologic formations at the facility in the reporting year (metric tons)
- $CO_{2,I}$ = Total annual CO_2 Mass Injected in the well or group of wells covered by this source category in the reporting year (metric tons)
- $CO_{2,P}$ = Total annual CO_2 Mass Produced net of CO_2 entrained in oil in the reporting year (metric tons)
- $CO_{2,E}$ = Total annual CO_2 Mass Emitted by surface leakage in the reporting year (metric tons)
- $CO_{2,FI}$ = Total annual CO_2 Mass Emitted from equipment leaks and vented emissions of CO_2 from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead, for which a calculation procedure is provided in GHGRP Subpart W (metric tons)
- $CO_{2,FP}$ = Total annual CO_2 Mass Emitted from equipment leaks and vented emissions of CO_2 from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity, for which a calculation procedure is provided in GHGRP Subpart W (metric tons)

7.6. Cumulative Mass of CO_2 Reported as Sequestered

The total annual CO_2 Mass Sequestered in subsurface geologic formations at the facility in the reporting year, using Equation RR-11, will be summed to calculate the Cumulative Mass of CO_2 Sequestered in subsurface geologic formations.

8. Estimated Schedule for Implementation of MRV Plan

This plan will be effective as of January 1, 2020, which is also the proposed date for beginning to collect data under this plan. Other GHG reports are filed on March 31 of the year after the reporting year and it is anticipated that the Annual Subpart RR Report will be filed at the same time. As described in Section 3.3 above, it is anticipated that the MRV program will be in effect during the Specified Period, during which time the NBU will be operated with the subsidiary or ancillary purpose of establishing long-term containment of a measurable quantity of CO_2 in the reservoir at the NBU. It is anticipated that Perdure will establish that a measurable amount of CO_2 injected during the Specified Period will be stored in a manner not expected to migrate in the future in a manner likely to result in surface leakage. At such time, a demonstration will be prepared that will supporting the long-term containment determination, and a request will be submitted to discontinue reporting under this MRV plan.
See Section 98.441(b)(2)(ii).

9. Quality Assurance Program

9.1. Monitoring

The requirements of Sections 98.444(a) – (d) are incorporated into the mass balance calculations in Section 7 above. These include the following:

CO_2 Received and Injected

- The quarterly flow rate of CO_2 received by pipeline is measured with volumetric flow meter(s) at the receiving custody transfer point(s).
- The quarterly CO_2 flow rate for recycled CO_2 is measured with volumetric flow meter(s) at the outlet of the RCF.

CO_2 Produced

- The point of measurement for the quantity of CO_2 produced from oil or other fluid production wells is a volumetric flow meter directly downstream of separation, sending a stream of gas into a recycle system or end use system.
- The produced gas stream is sampled at least once per quarter immediately downstream of the flow meter used to measure flow rate of that gas stream, and the CO_2 concentration of the sample is measured.
- The quarterly flow rate of the produced gas is measured with volumetric flow meter(s) located at the inlet of the RCF.

CO_2 emissions from equipment leaks and vented emissions of CO_2

- These volumes are measured in conformance with the monitoring and QA/QC requirements specified in Subpart W.

Flow meter provisions

The volumetric flow meters used to generate data for the mass balance equations in Section 7 are:

- Operated continuously except as necessary for maintenance and calibration.
- Operated using the calibration and accuracy requirements in Section 98.3(i).
- Operated in conformance with American Petroleum Institute (API) standards.
- National Institute of Standards and Technology (NIST) traceable.

Concentration of CO_2

- As required by Section 98.444(f)(1) and as indicated in Section 12.1, CO_2 concentration is measured using an appropriate standard method. Unless stated otherwise in the annual report, the standard method will be the use of a gas analyzer, which is an industry standard practice.
- As required by Section 98.444(f)(2), all measured volumes of CO_2 for Equations RR-2, RR-5 and RR-8 in Section 7 will be converted to standard cubic meters at a temperature of 60 degrees Fahrenheit and at an absolute pressure of 1 atmosphere.

9.2. Procedures for Estimating Missing Data

In the event any of the data needed for the mass balance calculations in Section 7 is unable to be collected, then the procedures for estimating missing data in §98.445 will be used. Those procedures include the following:

- A quarterly flow rate of CO_2 received that is missing would be estimated using invoices, purchase statements, or using a representative flow rate value from the nearest previous time period.
- A quarterly CO_2 concentration of a CO_2 stream received that is missing would be estimated using invoices, purchase statements, or using a representative concentration value from the nearest previous time period.
- A quarterly quantity of CO_2 injected that is missing would be estimated using a representative quantity of CO_2 injected from the nearest previous period of time at a similar injection pressure.
- For any values associated with CO_2 emissions from equipment leaks and vented emissions of CO_2 from surface equipment at the facility that are reported in Subpart RR, missing data estimation procedures specified in Subpart W would be followed.
- The quarterly quantity of CO_2 produced from subsurface geologic formations that is missing would be estimated using a representative quantity of CO_2 produced from the nearest previous period of time.
- When estimating the amount of CO_2 (due to an interruption in data collection, mechanical failure of a meter, mechanical failure of other equipment, or otherwise), the amount of CO_2 is to be estimated by using the most recent periodic (i.e. daily) volume of CO_2 associated with the meter or equipment and calculating the proportionate volume of “missing” CO_2 based on the number of hours involved in the data gap or until meter/equipment repair.

10. MRV Plan Revisions

In the event there is a material change to the monitoring and/or operational parameters of CO_2-EOR operations in the NBU that is not anticipated in this MRV plan, or if Perdure chooses to revise the MRV plan for any other reason, the MRV plan will be revised and submitted to the EPA Administrator within 180 days as required in Section 98.448(d). The proposed revision to this MRV plan will be submitted in the same manner and format as this MRV plan.

11. Records Retention

Records will be maintained as required under Section 98.3(g) and Section 98.447(a)(1) – (6). These records may be maintained electronically, in paper copies, or both. Data will be collected from these records and aggregated as required for reporting purposes.

12. Appendices

12.1. Conversion Factors

For purposes of this MRV Plan, CO_2 volumes are stated at Oklahoma standard conditions of temperature and pressure: 60°F and 14.65 psia.[31]

To convert these volumes into metric tons (tonnes), a density is calculated using the Span and Wagner equation of state as recommended by the EPA.[32] Density is calculated using the database of thermodynamic properties developed by the National Institute of Standards and Technology (NIST), available at http://webbook.nist.gov/chemistry/fluid/.

At State of Oklahoma standard conditions, the Span and Wagner equation of state gives a density of 0.0026417 lb-moles per cubic foot. Using a molecular weight for CO_2 of 44.00950, 2204.623 lbs/metric ton and 35.314667 ft^3/m^3, gives a CO_2 density of 5.2734289×10^{-2} MT/MCF or 0.001862294 MT/m^3.

The conversion factor 5.2734289×10^{-2} MT/MCF has been used throughout to convert CO_2 volumes to metric tons.

12.2. Acronyms

AGA – American Gas Association
AMA – Active Monitoring Area
AOR – Area of Review
API – American Petroleum Institute
BIA – US Bureau of Indian Affairs
BCF – billion cubic feet
cf – cubic feet
CO_2 – Carbon Dioxide
DOE – US Department of Energy
EOR – Enhanced Oil Recovery
EPA – US Environmental Protection Agency
GPA – Gas Processors Association
GHGRP – Greenhouse Gas Reporting Program
H_2S – Hydrogen Sulfide
LACT – Lease Automatic Custody Transfer
MIT – Mechanical Integrity Test
MMA – Maximum Monitoring Area
MCF – Thousand cubic feet
MMCF – Million cubic feet
MMP – Minimum Miscibility Pressure
MMT – Million metric tonnes
MRV – Monitoring, Reporting, and Verification
MMSTBO – Million stock tank barrels of oil
MT – Metric Ton (Tonne)

[31] 52 Okla. Stat. § 52-472.
[32] General Technical Support Document for Injection and Geologic Sequestration of Carbon Dioxide: Subparts RR and UU, EPA Greenhouse Gas Reporting Program, Office of Air and Radiation, November 2010, pg 25.

NIST – National Institute of Standards and Technology
NBU – North Burbank Unit
NGL – Natural Gas Liquid
OOIP – Original Oil-In-Place
PPM – Parts Per Million
PSIG – Pound per Square Inch, Gauge
RCF – NBU CO_2 Recycling and Compression Facility
SCADA – Supervisory Control And Data Acquisition
STB – Stock Tank Barrel
UIC – Underground Injection Control
VRU – Vapor Recovery Unit
WAG – Water Alternating Gas
WCI – Water Curtain Injection

12.3. Glossary of Terms

This glossary describes some of the technical terms as they are used in this MRV plan.[33]

Contain / Containment – having the effect of keeping fluids located within in a specified portion of a geologic formation.

Dip -- Very few, if any, geologic features are perfectly horizontal. They are almost always tilted. The direction of tilt is called "dip." Dip is the angle of steepest descent measured from the horizontal plane. Moving higher up structure is moving "updip." Moving lower is "downdip." Perpendicular to dip is "strike." Moving perpendicular along a constant depth is moving along strike.

Formation -- A body of rock that is sufficiently distinctive and continuous that it can be mapped.

Permeability -- Permeability is the measure of a rock's ability to transmit fluids. Rocks that transmit fluids readily, such as sandstones, are described as permeable and tend to have many large, well-connected pores. Impermeable formations, such as shales and siltstones, tend to be finer grained or of a mixed grain size, with smaller, fewer, or less interconnected pores.

Phase -- Phase is a region of space throughout which all physical properties of a material are essentially uniform. Fluids that don't mix together segregate themselves into phases. Oil, for example, does not mix with water and forms a separate phase.

Porosity -- Porosity is the fraction of a rock that is not occupied by solid grains or minerals. Almost all rocks have spaces between rock crystals or grains that is available to be filled with a fluid, such as water, oil or gas. This space is called "pore space."

Primary recovery -- The first stage of hydrocarbon production, in which natural reservoir energy, such as gas drive, water drive or gravity drainage, displaces hydrocarbons from the reservoir, into the wellbore and up to surface. Initially, the reservoir pressure is considerably higher than the bottom hole pressure inside the wellbore. This high natural differential pressure drives hydrocarbons toward the well and up to surface. However, as the reservoir pressure declines because of production, so does the differential pressure. To reduce the bottom hole pressure or increase the differential pressure to increase

[33] For additional glossaries please see the U.S. EPA Glossary of UIC Terms (http://water.epa.gov/type/groundwater/uic/glossary.cfm) and the Schlumberger Oilfield Glossary (http://www.glossary.oilfield.slb.com/).

hydrocarbon production, it is necessary to implement an artificial lift system, such as a rod pump, an electrical submersible pump or a gas-lift installation. Production using artificial lift is considered primary recovery. The primary recovery stage reaches its limit either when the reservoir pressure is so low that the production rates are not economical, or when the proportions of gas or water in the production stream are too high. During primary recovery, only a small percentage of the initial hydrocarbons in place are produced, typically around 10% for oil reservoirs. Primary recovery is also called primary production.

Saturation -- The fraction of pore space occupied by a given fluid. Oil saturation, for example, is the fraction of pore space occupied by oil.

Seal – A geologic layer (or multiple layers) of impermeable rock that serve as a barrier to prevent fluids from moving upwards to the surface.

Secondary recovery -- The second stage of hydrocarbon production during which an external fluid such as water or gas is injected into the reservoir through injection wells located in rock that has fluid communication with production wells. The purpose of secondary recovery is to maintain reservoir pressure and to displace hydrocarbons toward the wellbore. The most common secondary recovery techniques are gas injection and waterflooding.

Stratigraphic section -- A stratigraphic section is a sequence of layers of rocks in the order they were deposited.

12.4. Oklahoma Earthquake History Maps

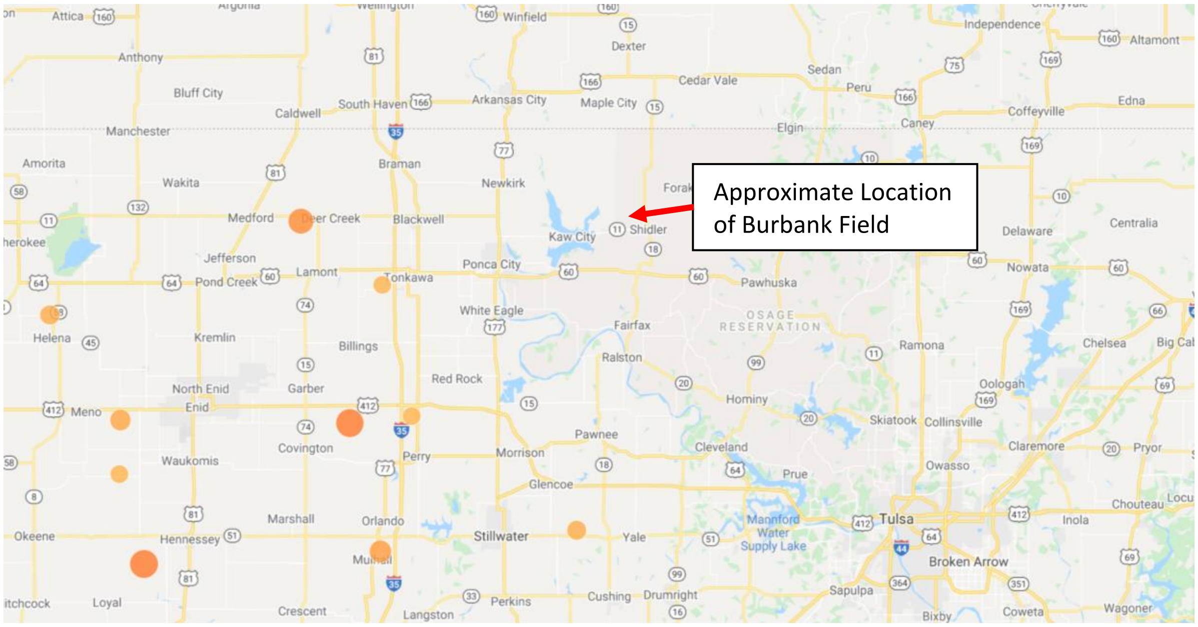

Figure 14 – Oklahoma Earthquake Densities: 1980-2012[34]

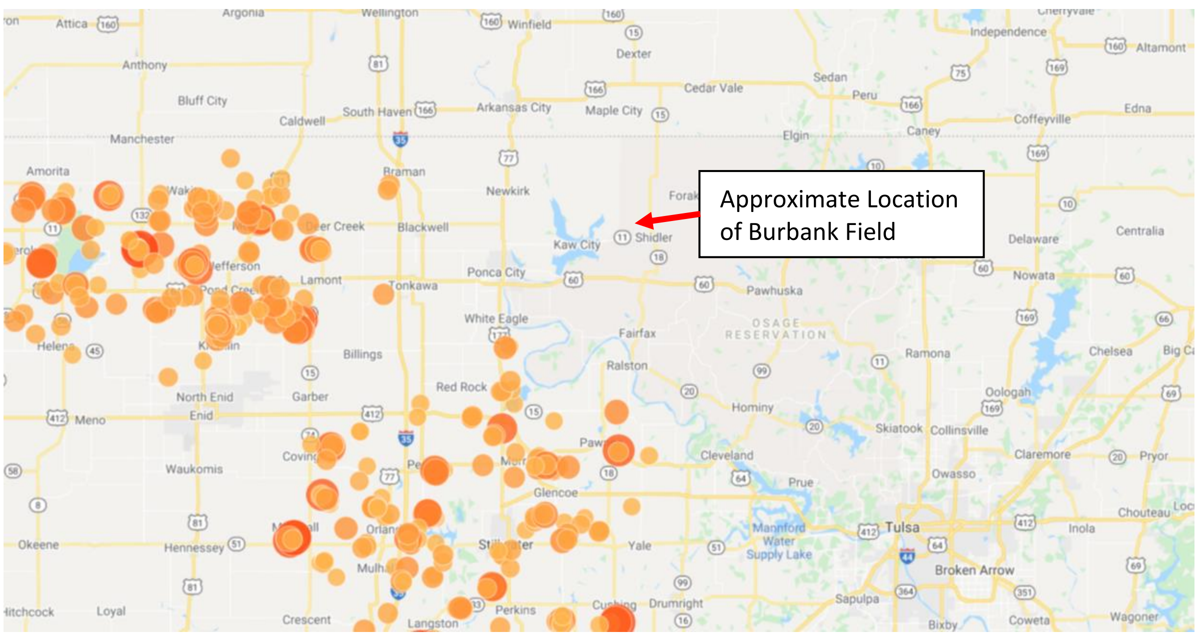

Figure 15 – Oklahoma Earthquake Densities: 2013-2014[35]

[34] http://earthquakes.ok.gov/what-we-know/earthquake-map/

[35] http://earthquakes.ok.gov/what-we-know/earthquake-map/

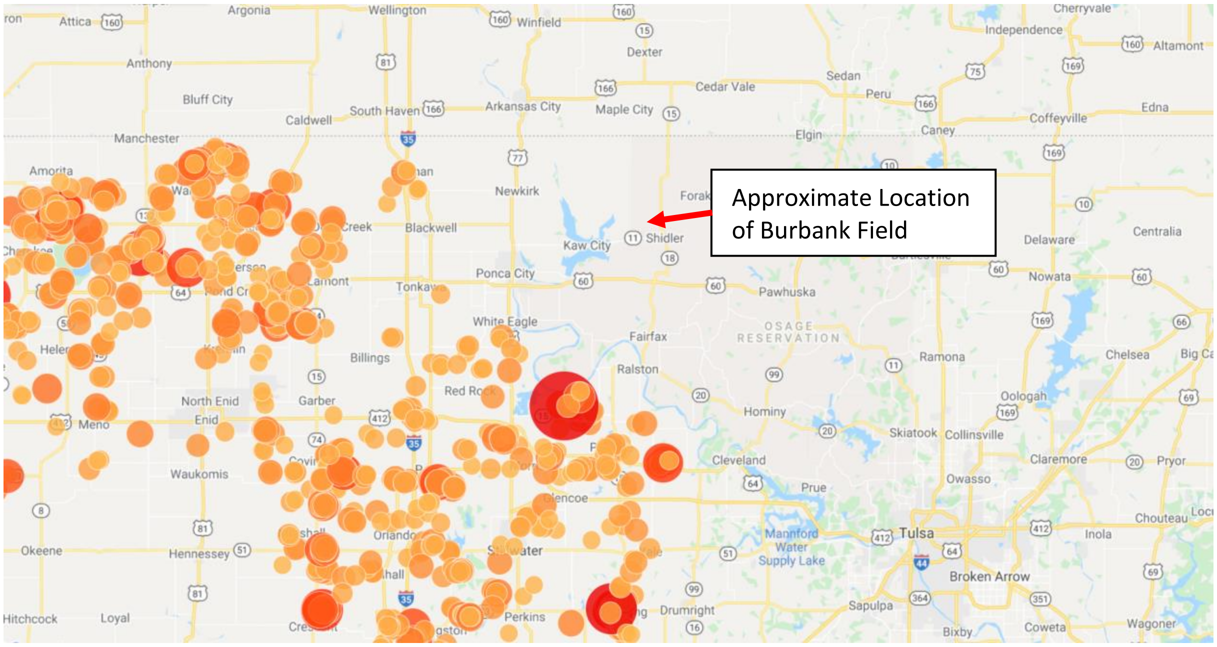

Figure 16 – Oklahoma Earthquake Densities: 2015-2016[36]

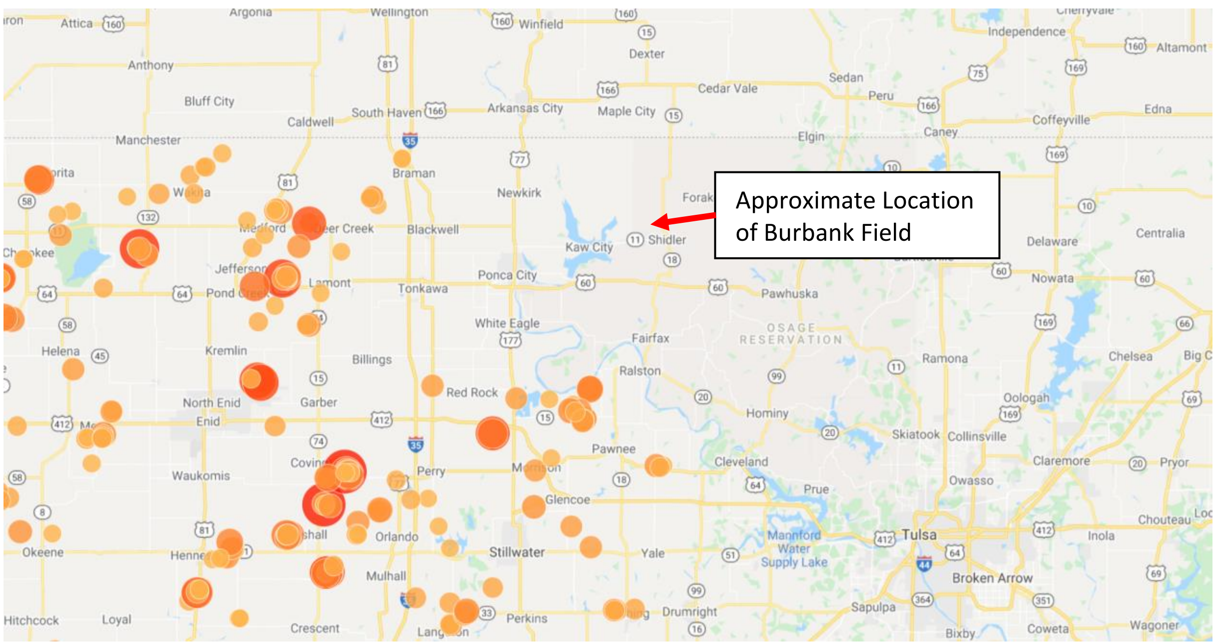

Figure 17 – Oklahoma Earthquake Densities: 2017-2018[37]

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36 http://earthquakes.ok.gov/what-we-know/earthquake-map/
37 http://earthquakes.ok.gov/what-we-know/earthquake-map/

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12.6. Reservoir-Related Publications

The NBU has been the subject of over 60 published reports, studies and articles, and the reservoir has been the object of numerous laboratory investigations and field tests of tertiary recovery. Some of the published papers, reports and other documents are listed in the References in Section 12.5 above, while many more are listed below.

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12.7. Wells

The following table presents the well name, API number, status and type for the wells in the NBU as of January 2020. The table is subject to change over time as new wells are drilled, existing wells change status, or existing wells are repurposed. The following terms are used:

- DRY refers to wells that were not produced and have been closed (plugged and abandoned)
- OIL refers to active wells that produce oil
- PA_GAS refers to gas production wells that have been closed (plugged and abandoned)
- PA_PROD refers to oil production wells that have been closed (plugged and abandoned)
- P&A_INJ refers to injection wells that have been closed (plugged and abandoned)
- P&A_UNKW refers to wells with an unknown type that have been closed (plugged and abandoned)
- SI_OIL refers to oil production wells that have been temporarily idled or shut-in
- SI_SWD refers to salt-water disposal wells that have been temporarily idled or shut-in
- SI_WINJ refers to water injection wells that have been temporarily idled or shut-in
- SI_WSW refers to water supply wells that have been temporarily idled or shut-in
- SI_WTR_SRVC refers to water service wells that have been temporarily idled or shut-in
- SWD refers to active salt-water disposal wells
- TA_INJ refers to water and CO_2 injection wells that have been temporarily abandoned
- TA_OIL refers to oil production wells that have been temporarily abandoned
- UNKNW refers to wells with an unknown status and type
- W_INJ refers to active wells that inject water
- WAG refers to active wells that inject water and CO_2
- WAG_TBD refers to wells anticipated to be drilled that inject water and CO_2

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-110-88510	4302A	SI_OIL	35-113-05572	13508W	P&A_INJ
35-113-05487	13001	SI_OIL	35-113-05573	13512	SI_OIL
35-113-05488	13002W	P&A_INJ	35-113-05574	13516W	P&A_INJ
35-113-05489	13003	OIL	35-113-05685	14002W	P&A_INJ
35-113-05490	13004W	P&A_INJ	35-113-05687	14006	OIL
35-113-05491	13005	P&A_INJ	35-113-05688	14007	SI_OIL
35-113-05493	13007	PA_PROD	35-113-06433	964	SI_WINJ
35-113-05494	13008W	P&A_INJ	35-113-07263	9303	PA_PROD
35-113-05495	13009	PA_PROD	35-113-07266	9302	PA_PROD
35-113-05496	13010W	PA_PROD	35-113-07269	9308	SI_OIL
35-113-05497	13011	PA_PROD	35-113-07271	9310	PA_PROD
35-113-05498	13012	PA_PROD	35-113-07272	9311	P&A_INJ
35-113-05499	13013	PA_PROD	35-113-07274	9313	PA_PROD
35-113-05500	13014W	PA_PROD	35-113-07275	9314	P&A_INJ
35-113-05501	13015	PA_PROD	35-113-07276	9315	P&A_INJ
35-113-05502	13016W	P&A_INJ	35-113-07277	9316	PA_PROD
35-113-05503	13007A	PA_PROD	35-113-07279	932	PA_GAS
35-113-05504	13017W	PA_PROD	35-113-07281	934	PA_PROD
35-113-05506	13305	SI_OIL	35-113-07282	9217	SI_OIL
35-113-05507	13306W	P&A_INJ	35-113-07283	9317	P&A_INJ
35-113-05508	13307	P&A_INJ	35-113-07284	9318W	SI_WINJ
35-113-05545	13605AW	SI_WINJ	35-113-07285	10002A	SI_OIL
35-113-05546	13614	SI_OIL	35-113-07286	10011	SI_OIL
35-113-05547	13615	SI_OIL	35-113-07287	10106A	OIL
35-113-05548	13617W	P&A_INJ	35-113-07292	9101	PA_PROD
35-113-05549	13813	PA_PROD	35-113-07293	9102	PA_PROD
35-113-05550	13903	SI_OIL	35-113-07294	9103	PA_PROD
35-113-05551	13601W	PA_PROD	35-113-07295	9104	PA_PROD
35-113-05552	13602	PA_PROD	35-113-07296	9105	PA_PROD
35-113-05553	13603W	P&A_INJ	35-113-07319	10801	PA_PROD
35-113-05554	13604	OIL	35-113-07320	10802	PA_PROD
35-113-05555	13605	PA_PROD	35-113-07321	10803	PA_PROD
35-113-05556	13606W	P&A_INJ	35-113-07322	10804	PA_PROD
35-113-05557	13607W	PA_PROD	35-113-07323	10805	PA_PROD
35-113-05558	13608W	P&A_INJ	35-113-07324	10803AW	SI_WINJ
35-113-05559	13609W	P&A_INJ	35-113-07325	10806	SI_OIL
35-113-05560	13610	SI_OIL	35-113-07326	10807	PA_PROD
35-113-05561	13611	PA_PROD	35-113-07412	1079	SI_OIL
35-113-05562	13612W	P&A_INJ	35-113-07413	1062	PA_PROD
35-113-05563	13706	PA_PROD	35-113-07414	10610	PA_PROD
35-113-05571	13504	SI_OIL	35-113-07415	1077	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07416	10608	PA_PROD	35-113-07457	10503	PA_PROD
35-113-07417	10609	PA_PROD	35-113-07458	10504	PA_PROD
35-113-07418	10602	PA_PROD	35-113-07459	10505	PA_PROD
35-113-07419	10603	PA_PROD	35-113-07460	10506	PA_PROD
35-113-07420	10605	PA_PROD	35-113-07461	10507	P&A_INJ
35-113-07421	10606	PA_PROD	35-113-07462	10508	PA_PROD
35-113-07422	10611	PA_PROD	35-113-07463	10509	PA_PROD
35-113-07423	10612	PA_PROD	35-113-07464	10510	PA_PROD
35-113-07424	10613	PA_PROD	35-113-07465	10511	OIL
35-113-07425	10614	P&A_INJ	35-113-07466	10512	PA_PROD
35-113-07426	9801	PA_PROD	35-113-07467	10513	PA_PROD
35-113-07427	9802	PA_PROD	35-113-07468	10514	PA_PROD
35-113-07428	9803	PA_PROD	35-113-07469	10515	SI_OIL
35-113-07429	9804	PA_PROD	35-113-07470	10516	PA_PROD
35-113-07430	9805	PA_PROD	35-113-07471	9601	PA_PROD
35-113-07431	9806	PA_PROD	35-113-07472	9602	PA_PROD
35-113-07432	9807	PA_PROD	35-113-07473	9603	PA_PROD
35-113-07433	9808	PA_PROD	35-113-07474	9604	SI_OIL
35-113-07434	9809	P&A_INJ	35-113-07475	9605	SI_OIL
35-113-07435	9810	PA_PROD	35-113-07476	9606	SI_OIL
35-113-07436	9811	PA_PROD	35-113-07477	9607	PA_PROD
35-113-07437	9812	PA_PROD	35-113-07478	9608	PA_PROD
35-113-07438	9813	P&A_INJ	35-113-07479	9609	PA_PROD
35-113-07439	9814	PA_PROD	35-113-07480	9610	PA_PROD
35-113-07440	9815	PA_PROD	35-113-07481	9611	PA_PROD
35-113-07441	9816	PA_PROD	35-113-07482	9612	PA_PROD
35-113-07442	10701	PA_PROD	35-113-07483	9613	PA_PROD
35-113-07443	10702	PA_PROD	35-113-07484	9614	PA_PROD
35-113-07444	10703	P&A_INJ	35-113-07485	9615	PA_PROD
35-113-07445	1064	PA_PROD	35-113-07486	9616	SI_OIL
35-113-07446	10705	PA_PROD	35-113-07487	9714A	SI_OIL
35-113-07447	10706	PA_PROD	35-113-07488	10409A	PA_PROD
35-113-07448	10707	PA_PROD	35-113-07489	9404A	PA_PROD
35-113-07449	10708	PA_PROD	35-113-07490	9406	P&A_INJ
35-113-07450	10709	PA_PROD	35-113-07491	9418	PA_PROD
35-113-07451	10711	PA_PROD	35-113-07492	10305A	PA_PROD
35-113-07452	10712	PA_PROD	35-113-07493	9501	PA_PROD
35-113-07453	9803A	PA_PROD	35-113-07494	9502	PA_PROD
35-113-07454	9805A	PA_PROD	35-113-07495	9504	SI_OIL
35-113-07455	10501	PA_PROD	35-113-07496	9503	PA_PROD
35-113-07456	10502	OIL	35-113-07497	9503A	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07498	9505	PA_PROD	35-113-07538	9516	PA_PROD
35-113-07499	9506	PA_PROD	35-113-07539	9417	PA_PROD
35-113-07500	9507	PA_PROD	35-113-07542	10901	PA_PROD
35-113-07501	9508	PA_PROD	35-113-07543	10902	PA_PROD
35-113-07502	9509W	W_INJ	35-113-07544	10903	PA_PROD
35-113-07503	9510	PA_PROD	35-113-07545	10904	SI_OIL
35-113-07504	9511	PA_PROD	35-113-07546	10905	PA_PROD
35-113-07505	9512	PA_PROD	35-113-07547	10906	PA_PROD
35-113-07506	9513	SI_OIL	35-113-07548	10907	PA_PROD
35-113-07507	9514	PA_PROD	35-113-07562	10908W	PA_PROD
35-113-07508	9515W	P&A_INJ	35-113-07563	10909	SI_OIL
35-113-07509	9516	SI_OIL	35-113-07564	10911	SI_OIL
35-113-07510	1028	SI_OIL	35-113-07565	10913	SI_OIL
35-113-07511	10211W	P&A_INJ	35-113-07566	11009	SI_OIL
35-113-07512	10215	PA_PROD	35-113-07567	11011	PA_PROD
35-113-07513	10203	SI_OIL	35-113-07568	11012W	SI_WINJ
35-113-07514	10204	PA_PROD	35-113-07569	11603	PA_PROD
35-113-07515	10205	PA_PROD	35-113-07570	11604W	P&A_INJ
35-113-07516	10206	PA_PROD	35-113-07571	11605W	P&A_INJ
35-113-07517	10207	PA_PROD	35-113-07572	11606	PA_PROD
35-113-07518	10208	PA_PROD	35-113-07573	11607	PA_PROD
35-113-07519	10209	PA_PROD	35-113-07574	11608	PA_PROD
35-113-07520	10210	PA_PROD	35-113-07575	11609	PA_PROD
35-113-07521	10212	PA_PROD	35-113-07576	11610	SI_OIL
35-113-07522	10213	SI_OIL	35-113-07577	11611	P&A_INJ
35-113-07523	10214	PA_PROD	35-113-07578	11612	SI_OIL
35-113-07524	10216	PA_PROD	35-113-07579	11601A	SI_OIL
35-113-07525	9401W	SI_WINJ	35-113-07602	12001	PA_PROD
35-113-07526	9402	PA_PROD	35-113-07603	12002W	W_INJ
35-113-07527	9402W	SI_WINJ	35-113-07604	12003	PA_PROD
35-113-07528	9403	SI_OIL	35-113-07605	12004	P&A_INJ
35-113-07529	9404W	P&A_INJ	35-113-07606	12005W	P&A_INJ
35-113-07530	9405	PA_PROD	35-113-07607	12006	PA_PROD
35-113-07530	9405A	SI_OIL	35-113-07608	12007	P&A_INJ
35-113-07531	9409	PA_PROD	35-113-07609	12008	PA_PROD
35-113-07532	9410W	W_INJ	35-113-07610	12009	PA_PROD
35-113-07533	9411	PA_PROD	35-113-07611	12010W	W_INJ
35-113-07534	9412	PA_PROD	35-113-07612	12011W	P&A_INJ
35-113-07535	9413	PA_PROD	35-113-07613	12012	OIL
35-113-07536	9414	PA_PROD	35-113-07614	12013	SI_OIL
35-113-07537	9415	SI_OIL	35-113-07615	12014	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07616	12015W	P&A_INJ	35-113-07657	11401AW	P&A_INJ
35-113-07617	12016	PA_PROD	35-113-07658	11801	P&A_INJ
35-113-07618	11301	DRY	35-113-07659	11802	P&A_INJ
35-113-07619	11302	PA_PROD	35-113-07660	11803	PA_PROD
35-113-07620	11303W	P&A_INJ	35-113-07661	11804	OIL
35-113-07621	11304	PA_PROD	35-113-07662	11805W	W_INJ
35-113-07622	11305	PA_PROD	35-113-07663	11806	P&A_INJ
35-113-07623	11306	PA_PROD	35-113-07664	11807	PA_PROD
35-113-07624	11307	PA_PROD	35-113-07665	11808	PA_PROD
35-113-07625	11308W	P&A_INJ	35-113-07666	11809	PA_PROD
35-113-07626	11309	P&A_INJ	35-113-07667	11810W	P&A_INJ
35-113-07627	11901	PA_PROD	35-113-07668	11811	PA_PROD
35-113-07628	11902	PA_PROD	35-113-07669	11812W	P&A_INJ
35-113-07629	11903W	P&A_INJ	35-113-07670	11813	PA_PROD
35-113-07630	11904	SI_OIL	35-113-07671	11814	P&A_INJ
35-113-07631	11905	PA_PROD	35-113-07672	11815	PA_PROD
35-113-07632	11906	PA_PROD	35-113-07673	11116	PA_PROD
35-113-07633	11907	OIL	35-113-07674	11201	PA_PROD
35-113-07634	11908	PA_PROD	35-113-07675	11202	PA_PROD
35-113-07635	11909W	P&A_INJ	35-113-07676	11203	PA_PROD
35-113-07636	11910W	W_INJ	35-113-07677	11204	PA_PROD
35-113-07637	11911	P&A_INJ	35-113-07678	11205	OIL
35-113-07638	11912	PA_PROD	35-113-07679	11206W	SI_WINJ
35-113-07639	11913	PA_PROD	35-113-07680	11207	OIL
35-113-07640	11401	PA_PROD	35-113-07681	11208	PA_PROD
35-113-07641	11402	PA_PROD	35-113-07682	11209	PA_PROD
35-113-07642	11403	PA_PROD	35-113-07683	11103	PA_PROD
35-113-07643	11404	PA_PROD	35-113-07684	11211W	W_INJ
35-113-07644	11405	PA_PROD	35-113-07685	11212	P&A_INJ
35-113-07645	11406	PA_PROD	35-113-07686	11213	PA_PROD
35-113-07646	11407	PA_PROD	35-113-07687	11214	PA_PROD
35-113-07647	11408	PA_PROD	35-113-07688	11215	PA_PROD
35-113-07648	11409	P&A_INJ	35-113-07689	11216	P&A_INJ
35-113-07649	11410	PA_PROD	35-113-07690	11101	PA_PROD
35-113-07650	11303	DRY	35-113-07691	11102	PA_PROD
35-113-07651	11401A	PA_PROD	35-113-07692	11103W	W_INJ
35-113-07652	12006A	P&A_INJ	35-113-07693	11104	PA_PROD
35-113-07653	12008A	P&A_INJ	35-113-07694	11105	PA_PROD
35-113-07654	12009A	P&A_INJ	35-113-07695	11106	PA_PROD
35-113-07655	12014A	OIL	35-113-07696	11107	PA_PROD
35-113-07656	12016A	SI_OIL	35-113-07697	11108	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07698	11109	PA_PROD	35-113-07773	14504	PA_PROD
35-113-07699	11710	OIL	35-113-07775	12701	PA_PROD
35-113-07700	11110	PA_PROD	35-113-07776	12702	PA_PROD
35-113-07701	11111	PA_PROD	35-113-07777	12703	SI_OIL
35-113-07702	11112	PA_PROD	35-113-07778	12704	SI_OIL
35-113-07703	11113	OIL	35-113-07779	12705	PA_PROD
35-113-07704	11114	SI_OIL	35-113-07780	12706	PA_PROD
35-113-07705	11115W	P&A_INJ	35-113-07781	12707	PA_PROD
35-113-07707	11701	PA_PROD	35-113-07782	12708	PA_PROD
35-113-07708	11702	PA_PROD	35-113-07783	12709	PA_PROD
35-113-07709	11704	P&A_INJ	35-113-07784	12710	P&A_INJ
35-113-07710	11705	OIL	35-113-07785	12711	PA_PROD
35-113-07711	11706	PA_PROD	35-113-07786	12712	PA_PROD
35-113-07712	11707W	P&A_INJ	35-113-07787	12713	PA_PROD
35-113-07713	11709W	W_INJ	35-113-07788	12814	SI_OIL
35-113-07714	11711W	P&A_INJ	35-113-07789	12715	PA_PROD
35-113-07715	11712	SI_OIL	35-113-07790	12716	SI_OIL
35-113-07716	11713W	P&A_INJ	35-113-07791	12801	PA_PROD
35-113-07717	11714	PA_PROD	35-113-07792	12802	OIL
35-113-07718	11715W	P&A_INJ	35-113-07793	12803	OIL
35-113-07719	11716	PA_PROD	35-113-07794	12804	PA_PROD
35-113-07720	11501	PA_PROD	35-113-07795	12805	OIL
35-113-07721	11502	PA_PROD	35-113-07796	12806	SI_OIL
35-113-07722	11503	PA_PROD	35-113-07797	12807	PA_PROD
35-113-07723	11504	DRY	35-113-07798	12808A	PA_PROD
35-113-07724	11505	P&A_INJ	35-113-07799	12809	SI_OIL
35-113-07725	11506	PA_PROD	35-113-07800	12810	P&A_INJ
35-113-07726	12101	PA_PROD	35-113-07801	12811W	SI_WINJ
35-113-07727	12102W	P&A_INJ	35-113-07802	12812	PA_PROD
35-113-07728	12103	PA_PROD	35-113-07803	12813W	P&A_INJ
35-113-07729	12104W	P&A_INJ	35-113-07804	12814	PA_PROD
35-113-07730	12105W	P&A_INJ	35-113-07805	12815	PA_PROD
35-113-07765	12501	PA_PROD	35-113-07806	12301	PA_PROD
35-113-07766	12502W	P&A_INJ	35-113-07807	12302	OIL
35-113-07767	12503	PA_PROD	35-113-07808	12303	PA_PROD
35-113-07767	12503A	PA_PROD	35-113-07809	12304W	P&A_INJ
35-113-07768	12504	PA_PROD	35-113-07810	12305W	P&A_INJ
35-113-07769	12505	P&A_INJ	35-113-07811	12306	PA_PROD
35-113-07770	14501	PA_PROD	35-113-07812	12307	OIL
35-113-07771	14502	PA_PROD	35-113-07813	12308W	P&A_INJ
35-113-07772	14503	PA_PROD	35-113-07814	12309	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07815	12311	P&A_INJ	35-113-07856	12204W	W_INJ
35-113-07816	12312W	P&A_INJ	35-113-07857	12205W	P&A_INJ
35-113-07817	12313	PA_PROD	35-113-07858	12206W	P&A_INJ
35-113-07818	12314W	P&A_INJ	35-113-07859	12207W	W_INJ
35-113-07819	12315	PA_PROD	35-113-07860	12208	PA_PROD
35-113-07820	12316	PA_PROD	35-113-07861	12209W	P&A_INJ
35-113-07821	12310	PA_PROD	35-113-07862	12211W	P&A_INJ
35-113-07822	12401	PA_PROD	35-113-07863	12212	PA_PROD
35-113-07823	12402	PA_PROD	35-113-07864	12213W	P&A_INJ
35-113-07824	12403	SI_OIL	35-113-07865	12214	OIL
35-113-07825	12405W	P&A_INJ	35-113-07866	12215	SI_OIL
35-113-07826	12406W	P&A_INJ	35-113-07867	12216	PA_PROD
35-113-07827	12407	PA_PROD	35-113-07868	14401	PA_PROD
35-113-07828	12408W	W_INJ	35-113-07869	14402	PA_PROD
35-113-07829	12409	OIL	35-113-07870	14403	PA_PROD
35-113-07830	12410W	W_INJ	35-113-07871	14404	PA_PROD
35-113-07831	12411W	W_INJ	35-113-07872	14405	PA_PROD
35-113-07832	12412W	P&A_INJ	35-113-07873	14406	SI_OIL
35-113-07833	12413	PA_PROD	35-113-07884	12207A	SI_OIL
35-113-07834	12404	PA_PROD	35-113-07885	12608W	P&A_INJ
35-113-07835	12301AW	W_INJ	35-113-07886	12609	SI_OIL
35-113-07836	12316W	P&A_INJ	35-113-07887	12615	SI_OIL
35-113-07837	12401A	SI_OIL	35-113-07888	12616	P&A_INJ
35-113-07838	12804W	P&A_INJ	35-113-07889	14401A	PA_PROD
35-113-07839	12414	PA_PROD	35-113-07890	14402A	PA_PROD
35-113-07840	12416W	P&A_INJ	35-113-07891	14406W	P&A_INJ
35-113-07841	12808W	P&A_INJ	35-113-07892	14408	PA_PROD
35-113-07842	12601	P&A_INJ	35-113-07893	14409	SI_OIL
35-113-07843	12602	PA_PROD	35-113-07894	14412	PA_PROD
35-113-07844	12603	OIL	35-113-07895	14413	PA_PROD
35-113-07845	12604	PA_PROD	35-113-07896	14414	PA_PROD
35-113-07846	12605	SI_OIL	35-113-07942	13209	PA_PROD
35-113-07847	12606	SI_OIL	35-113-07994	12902	OIL
35-113-07848	12610	SI_OIL	35-113-07995	12903	SI_OIL
35-113-07849	12611W	W_INJ	35-113-07996	12904	PA_PROD
35-113-07850	12612	PA_PROD	35-113-07997	12905W	W_INJ
35-113-07851	12613W	P&A_INJ	35-113-07998	12906W	P&A_INJ
35-113-07852	12614	SI_OIL	35-113-07999	12907	PA_PROD
35-113-07853	12201W	P&A_INJ	35-113-08000	12908W	W_INJ
35-113-07854	12202	OIL	35-113-08001	12909	OIL
35-113-07855	12203W	P&A_INJ	35-113-08002	12910	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08003	12911	P&A_INJ	35-113-08053	502	SI_OIL
35-113-08004	12912	SI_OIL	35-113-08054	521W	P&A_INJ
35-113-08005	12913	PA_PROD	35-113-08055	522W	P&A_INJ
35-113-08006	12914	SI_OIL	35-113-08056	523W	P&A_INJ
35-113-08007	13201W	SI_WINJ	35-113-08057	524W	P&A_INJ
35-113-08008	13202	SI_OIL	35-113-08058	526W	P&A_INJ
35-113-08010	13204	PA_PROD	35-113-08059	527W	W_INJ
35-113-08011	13207	PA_PROD	35-113-08060	528W	P&A_INJ
35-113-08012	13208	SI_OIL	35-113-08061	201	PA_PROD
35-113-08013	13211W	SI_WINJ	35-113-08062	202	DRY
35-113-08022	702	PA_PROD	35-113-08063	203	DRY
35-113-08023	703	PA_PROD	35-113-08064	204	DRY
35-113-08024	705	PA_PROD	35-113-08065	205	DRY
35-113-08025	706	DRY	35-113-08067	503	OIL
35-113-08026	613	PA_PROD	35-113-08068	401	PA_PROD
35-113-08027	616	DRY	35-113-08069	407	PA_PROD
35-113-08028	601	OIL	35-113-08070	104	PA_PROD
35-113-08029	611	OIL	35-113-08074	301	OIL
35-113-08030	621W	P&A_INJ	35-113-08075	302	OIL
35-113-08031	622W	P&A_INJ	35-113-08076	303	OIL
35-113-08032	623W	WAG	35-113-08077	304	SI_OIL
35-113-08033	624W	P&A_INJ	35-113-08078	305W	SI_WINJ
35-113-08034	625W	P&A_INJ	35-113-08079	306A	SI_OIL
35-113-08035	721W	P&A_INJ	35-113-08080	307	PA_PROD
35-113-08036	207	PA_PROD	35-113-08085	308	SI_OIL
35-113-08037	106	SI_OIL	35-113-08086	309	SI_OIL
35-113-08038	107W	DRY	35-113-08087	310	OIL
35-113-08039	525W	P&A_INJ	35-113-08088	322W	P&A_INJ
35-113-08040	104A	SI_OIL	35-113-08089	323W	W_INJ
35-113-08041	401A	OIL	35-113-08090	324W	W_INJ
35-113-08042	409	OIL	35-113-08091	325W	P&A_INJ
35-113-08043	410	OIL	35-113-08092	326W	W_INJ
35-113-08044	411	OIL	35-113-08093	327W	SI_WINJ
35-113-08045	421W	P&A_INJ	35-113-08094	328W	W_INJ
35-113-08046	422W	WAG	35-113-08095	801	OIL
35-113-08047	423W	P&A_INJ	35-113-08096	1401	OIL
35-113-08048	424W	P&A_INJ	35-113-08097	803	OIL
35-113-08049	425W	P&A_INJ	35-113-08098	804	OIL
35-113-08050	426W	W_INJ	35-113-08099	805	PA_PROD
35-113-08051	427W	P&A_INJ	35-113-08100	806	OIL
35-113-08052	428W	W_INJ	35-113-08101	807	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08102	808	P&A_INJ	35-113-08143	1024W	P&A_INJ
35-113-08103	809	P&A_INJ	35-113-08144	1025W	WAG
35-113-08104	810W	W_INJ	35-113-08145	1026W	P&A_INJ
35-113-08105	811	OIL	35-113-08146	1027W	WAG
35-113-08106	812W	TA_OIL	35-113-08147	1028W	P&A_INJ
35-113-08107	813	PA_PROD	35-113-08148	1510A	OIL
35-113-08108	816	OIL	35-113-08149	1521W	WAG
35-113-08109	822W	P&A_INJ	35-113-08150	1522W	WAG
35-113-08110	823W	P&A_INJ	35-113-08151	1523W	P&A_INJ
35-113-08111	824W	P&A_INJ	35-113-08152	1524W	P&A_INJ
35-113-08112	826W	P&A_INJ	35-113-08153	1525W	WAG
35-113-08113	827W	P&A_INJ	35-113-08154	1526W	P&A_INJ
35-113-08114	828W	WAG	35-113-08155	1527W	WAG
35-113-08115	1422W	W_INJ	35-113-08156	1528W	P&A_INJ
35-113-08116	1427W	P&A_INJ	35-113-08157	1621W	P&A_INJ
35-113-08117	902	OIL	35-113-08158	1622W	P&A_INJ
35-113-08118	903	PA_PROD	35-113-08159	1623W	P&A_INJ
35-113-08119	904	OIL	35-113-08160	1624W	WAG
35-113-08120	905	PA_PROD	35-113-08161	1625W	WAG
35-113-08121	906	PA_PROD	35-113-08162	1626W	P&A_INJ
35-113-08122	907	PA_PROD	35-113-08163	1627W	WAG
35-113-08123	908	OIL	35-113-08164	1017	DRY
35-113-08124	909	PA_PROD	35-113-08165	1517W	P&A_INJ
35-113-08125	910	P&A_INJ	35-113-08166	1121W	P&A_INJ
35-113-08126	911	SI_OIL	35-113-08167	1122W	P&A_INJ
35-113-08127	912	OIL	35-113-08168	1123W	WAG
35-113-08128	913	PA_PROD	35-113-08169	1124W	P&A_INJ
35-113-08129	914	PA_PROD	35-113-08170	1125W	P&A_INJ
35-113-08130	915	P&A_INJ	35-113-08171	1126W	WAG
35-113-08131	916	OIL	35-113-08172	1127W	P&A_INJ
35-113-08132	921W	WAG	35-113-08173	1128W	WAG
35-113-08133	922W	P&A_INJ	35-113-08174	1221W	WAG
35-113-08134	923W	WAG	35-113-08175	1222W	P&A_INJ
35-113-08135	924W	PA_PROD	35-113-08176	1223W	W_INJ
35-113-08136	925W	WAG	35-113-08177	1224W	P&A_INJ
35-113-08137	926W	P&A_INJ	35-113-08178	1225W	WAG
35-113-08138	927W	WAG	35-113-08179	1226W	P&A_INJ
35-113-08139	928W	P&A_INJ	35-113-08180	1227W	P&A_INJ
35-113-08140	1021W	P&A_INJ	35-113-08181	1721W	P&A_INJ
35-113-08141	1022W	P&A_INJ	35-113-08182	1722W	P&A_INJ
35-113-08142	1023W	WAG	35-113-08183	1723W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08184	1724W	WAG	35-113-08226	2621W	P&A_INJ
35-113-08185	1725W	P&A_INJ	35-113-08227	2622W	P&A_INJ
35-113-08186	1726W	P&A_INJ	35-113-08228	2623W	P&A_INJ
35-113-08187	1727W	P&A_INJ	35-113-08229	2624W	P&A_INJ
35-113-08188	1728W	P&A_INJ	35-113-08230	2625W	WAG
35-113-08189	1821W	WAG	35-113-08231	2626	P&A_INJ
35-113-08190	1822W	P&A_INJ	35-113-08232	2627W	P&A_INJ
35-113-08191	1823	P&A_INJ	35-113-08233	2628W	SI_WINJ
35-113-08192	1825W	P&A_INJ	35-113-08234	3321W	PA_PROD
35-113-08193	1826W	P&A_INJ	35-113-08235	3323W	PA_PROD
35-113-08194	1827W	P&A_INJ	35-113-08236	3325W	P&A_INJ
35-113-08195	1828W	W_INJ	35-113-08237	3327W	P&A_INJ
35-113-08196	1802	P&A_INJ	35-113-08238	3404	PA_PROD
35-113-08197	1803	OIL	35-113-08238	3404A	OIL
35-113-08198	1804	PA_PROD	35-113-08239	3421W	P&A_INJ
35-113-08199	1805	P&A_INJ	35-113-08240	3423W	P&A_INJ
35-113-08200	1806	P&A_INJ	35-113-08241	3425W	WAG
35-113-08201	1807	P&A_INJ	35-113-08242	3427W	P&A_INJ
35-113-08202	1808	OIL	35-113-08243	2601	OIL
35-113-08204	1810	OIL	35-113-08244	2602	OIL
35-113-08205	1811	OIL	35-113-08245	2603	OIL
35-113-08206	1812	OIL	35-113-08246	2604	OIL
35-113-08207	1813	PA_PROD	35-113-08247	2605	W_INJ
35-113-08208	1814	OIL	35-113-08248	2606	PA_PROD
35-113-08209	1815	OIL	35-113-08249	2607W	P&A_INJ
35-113-08210	1816	P&A_INJ	35-113-08250	2608	PA_PROD
35-113-08211	1801	OIL	35-113-08251	2609	P&A_INJ
35-113-08212	1209	OIL	35-113-08252	2610	PA_PROD
35-113-08213	1210	OIL	35-113-08253	2611	OIL
35-113-08214	1217	P&A_INJ	35-113-08254	2612	PA_PROD
35-113-08215	2502A	OIL	35-113-08255	2613	OIL
35-113-08216	2503A	OIL	35-113-08256	2614	OIL
35-113-08217	2511A	OIL	35-113-08257	2615	PA_PROD
35-113-08218	2521W	WAG	35-113-08258	2616	SI_WINJ
35-113-08219	2522W	P&A_INJ	35-113-08259	2501	OIL
35-113-08220	2523W	P&A_INJ	35-113-08261	2503	PA_PROD
35-113-08221	2524W	WAG	35-113-08262	2504	PA_PROD
35-113-08222	2525W	P&A_INJ	35-113-08263	2505	PA_PROD
35-113-08223	2526W	P&A_INJ	35-113-08264	2506	PA_PROD
35-113-08224	2527W	P&A_INJ	35-113-08265	2507	PA_PROD
35-113-08225	2528W	P&A_INJ	35-113-08266	2508	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08268	2510	PA_PROD	35-113-08312	3206	PA_PROD
35-113-08269	2511	PA_PROD	35-113-08313	3203	OIL
35-113-08270	2512	PA_PROD	35-113-08314	3208	PA_PROD
35-113-08271	2513	PA_PROD	35-113-08315	3209	PA_PROD
35-113-08272	2514	PA_PROD	35-113-08316	3210	PA_PROD
35-113-08273	2515	OIL	35-113-08317	3211	SI_OIL
35-113-08275	3401	PA_PROD	35-113-08318	3212	PA_PROD
35-113-08276	3402	OIL	35-113-08319	3213	PA_PROD
35-113-08277	3403	PA_PROD	35-113-08320	3214	PA_PROD
35-113-08277	3403A	OIL	35-113-08321	3215	OIL
35-113-08279	3405W	P&A_INJ	35-113-08322	3216	OIL
35-113-08280	3406	PA_PROD	35-113-08323	3101A	OIL
35-113-08281	3407	PA_PROD	35-113-08324	3101	PA_PROD
35-113-08282	3408	PA_PROD	35-113-08325	3102	OIL
35-113-08283	3409	PA_PROD	35-113-08326	3103	OIL
35-113-08284	3410	OIL	35-113-08327	3104	DRY
35-113-08285	3411	OIL	35-113-08328	3104A	OIL
35-113-08286	3412	OIL	35-113-08329	3105	PA_PROD
35-113-08287	3413	PA_PROD	35-113-08330	3106	OIL
35-113-08288	3414	PA_PROD	35-113-08331	3107	PA_PROD
35-113-08289	3415	PA_PROD	35-113-08332	3108	PA_PROD
35-113-08290	3416	PA_PROD	35-113-08333	3109	PA_PROD
35-113-08291	3301	OIL	35-113-08334	3110	PA_PROD
35-113-08292	3302	OIL	35-113-08335	3111	OIL
35-113-08293	3303	OIL	35-113-08336	3112	PA_PROD
35-113-08294	3304	OIL	35-113-08337	3113	PA_PROD
35-113-08295	3305	PA_PROD	35-113-08338	3114	PA_PROD
35-113-08296	3306	OIL	35-113-08339	3115	OIL
35-113-08297	3307	PA_PROD	35-113-08340	3116	OIL
35-113-08298	3308	PA_PROD	35-113-08341	2301	OIL
35-113-08300	3310	PA_PROD	35-113-08342	2302A	OIL
35-113-08301	3311	OIL	35-113-08343	2303	PA_PROD
35-113-08302	3312	PA_PROD	35-113-08344	2304	PA_PROD
35-113-08303	3313	PA_PROD	35-113-08345	2305	PA_PROD
35-113-08304	3314	P&A_INJ	35-113-08346	2306	PA_PROD
35-113-08305	3315	OIL	35-113-08347	2307W	WAG
35-113-08306	3316	OIL	35-113-08348	2308	PA_PROD
35-113-08307	321	PA_PROD	35-113-08349	2309	OIL
35-113-08308	3202	OIL	35-113-08350	2310	OIL
35-113-08310	3204	OIL	35-113-08351	2311	PA_PROD
35-113-08311	3205	PA_PROD	35-113-08352	2312	OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08353	2313	PA_PROD	35-113-08412	2201	OIL
35-113-08354	2314	P&A_INJ	35-113-08413	2202W	W_INJ
35-113-08355	2315	PA_PROD	35-113-08414	2203	OIL
35-113-08356	2316	PA_PROD	35-113-08415	2204W	P&A_INJ
35-113-08357	2321W	WAG	35-113-08416	2205	OIL
35-113-08358	2323W	P&A_INJ	35-113-08417	2206	PA_PROD
35-113-08359	2325W	WAG	35-113-08418	2207	OIL
35-113-08360	2326W	P&A_INJ	35-113-08419	2208	PA_PROD
35-113-08361	2327W	P&A_INJ	35-113-08420	2209	OIL
35-113-08362	2328W	WAG	35-113-08421	2210	PA_PROD
35-113-08363	2421W	WAG	35-113-08422	2211	P&A_INJ
35-113-08364	2422W	P&A_INJ	35-113-08423	2212	PA_PROD
35-113-08365	2423W	P&A_INJ	35-113-08424	2213	PA_PROD
35-113-08366	2424W	WAG	35-113-08425	2214	PA_PROD
35-113-08367	2425W	P&A_INJ	35-113-08426	2215	OIL
35-113-08368	2426W	P&A_INJ	35-113-08427	2216	PA_PROD
35-113-08369	2427W	P&A_INJ	35-113-08428	3801	PA_PROD
35-113-08370	2428W	P&A_INJ	35-113-08429	3802	PA_PROD
35-113-08371	3121W	P&A_INJ	35-113-08429	3802A	SI_OIL
35-113-08372	3123W	P&A_INJ	35-113-08430	3803	P&A_INJ
35-113-08373	3125W	WAG	35-113-08431	3804	PA_PROD
35-113-08374	3127W	P&A_INJ	35-113-08431	3804A	SI_OIL
35-113-08375	3221W	P&A_INJ	35-113-08432	3805	SI_OIL
35-113-08376	3223W	WAG	35-113-08433	3806	PA_PROD
35-113-08377	3225W	WAG	35-113-08434	3807	PA_PROD
35-113-08378	3227W	WAG	35-113-08435	3808W	P&A_INJ
35-113-08394	2223W	P&A_INJ	35-113-08436	3809	PA_PROD
35-113-08395	2227W	P&A_INJ	35-113-08437	3810	PA_PROD
35-113-08396	3008A	PA_PROD	35-113-08438	3811	PA_PROD
35-113-08397	3015A	OIL	35-113-08439	3812W	P&A_INJ
35-113-08398	3022W	P&A_INJ	35-113-08440	3813W	P&A_INJ
35-113-08399	3023W	W_INJ	35-113-08441	3814	PA_PROD
35-113-08400	3025W	W_INJ	35-113-08442	3815W	SI_WINJ
35-113-08401	3027W	W_INJ	35-113-08443	3816	PA_PROD
35-113-08402	3001	SI_OIL	35-113-08444	4701	P&A_INJ
35-113-08403	3002	SI_OIL	35-113-08445	4702	P&A_INJ
35-113-08404	3003	PA_PROD	35-113-08445	4702AW	SI_WINJ
35-113-08405	3004	PA_PROD	35-113-08446	4703	PA_PROD
35-113-08406	3006	PA_PROD	35-113-08447	4704	P&A_INJ
35-113-08407	3011	OIL	35-113-08448	4706	PA_PROD
35-113-08408	3012	OIL	35-113-08449	4707	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08450	4708	P&A_INJ	35-113-08491	4016	OIL
35-113-08451	4709	PA_PROD	35-113-08492	4101	PA_PROD
35-113-08452	4710	P&A_INJ	35-113-08492	4101A	SI_OIL
35-113-08453	4711	PA_PROD	35-113-08493	4102	SI_OIL
35-113-08454	4712	PA_PROD	35-113-08494	4103	PA_PROD
35-113-08455	3827W	P&A_INJ	35-113-08494	4103A	SI_OIL
35-113-08456	4728W	P&A_INJ	35-113-08495	4104	SI_OIL
35-113-08457	3921W	P&A_INJ	35-113-08496	4105	PA_PROD
35-113-08458	3923W	P&A_INJ	35-113-08497	4106	PA_PROD
35-113-08459	3925W	WAG	35-113-08498	4107	PA_PROD
35-113-08460	3927W	P&A_INJ	35-113-08499	4108	PA_PROD
35-113-08461	4021W	P&A_INJ	35-113-08500	4109	PA_PROD
35-113-08462	4023W	P&A_INJ	35-113-08501	4110	PA_PROD
35-113-08463	4025W	P&A_INJ	35-113-08502	4111	OIL
35-113-08464	4027W	P&A_INJ	35-113-08503	4112	OIL
35-113-08465	4825W	P&A_INJ	35-113-08504	4113	SI_OIL
35-113-08466	4827W	P&A_INJ	35-113-08505	4114	OIL
35-113-08467	4922W	P&A_INJ	35-113-08505	4114W	P&A_INJ
35-113-08468	4923W	P&A_INJ	35-113-08506	4115	PA_PROD
35-113-08469	4925W	P&A_INJ	35-113-08507	4116	WAG
35-113-08470	4927W	SI_WINJ	35-113-08508	5101	SI_OIL
35-113-08471	3901	SI_OIL	35-113-08509	5102	PA_PROD
35-113-08473	3908	PA_PROD	35-113-08510	5103	SI_OIL
35-113-08474	3917	P&A_INJ	35-113-08511	5104	SI_OIL
35-113-08475	4001	PA_PROD	35-113-08512	5105	PA_PROD
35-113-08475	4001A	SI_OIL	35-113-08513	5106	PA_PROD
35-113-08476	4002	PA_PROD	35-113-08514	5107	P&A_INJ
35-113-08477	4003W	W_INJ	35-113-08515	5130W	W_INJ
35-113-08478	4004	SI_OIL	35-113-08516	5109	PA_PROD
35-113-08479	4005	PA_PROD	35-113-08517	5110	PA_PROD
35-113-08480	4006W	W_INJ	35-113-08518	5111	OIL
35-113-08481	4007	PA_PROD	35-113-08519	5112	SI_OIL
35-113-08482	4008	PA_PROD	35-113-08520	5113	PA_PROD
35-113-08483	4009	PA_PROD	35-113-08521	5114	PA_PROD
35-113-08484	4010	PA_PROD	35-113-08522	5115	SI_OIL
35-113-08485	4011	PA_PROD	35-113-08523	4116	PA_PROD
35-113-08486	4012	PA_PROD	35-113-08524	4141W	P&A_INJ
35-113-08487	4013	OIL	35-113-08525	4121AW	SI_WINJ
35-113-08488	4014A	SI_OIL	35-113-08525	4121W	P&A_INJ
35-113-08489	4014	PA_PROD	35-113-08526	4128AW	SI_WINJ
35-113-08490	4015W	SI_WINJ	35-113-08526	4128W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08527	4125W	WAG	35-113-08568	6410	SI_WINJ
35-113-08528	4127W	P&A_INJ	35-113-08569	6411	OIL
35-113-08529	4131W	P&A_INJ	35-113-08570	6412	OIL
35-113-08530	4232D	SWD	35-113-08571	6501W	P&A_INJ
35-113-08531	4223W	P&A_INJ	35-113-08572	6502W	P&A_INJ
35-113-08532	4225W	W_INJ	35-113-08573	6505W	P&A_INJ
35-113-08533	4227W	P&A_INJ	35-113-08574	6407	PA_PROD
35-113-08534	5005A	TA_OIL	35-113-08575	6506W	W_INJ
35-113-08535	5024W	P&A_INJ	35-113-08577	6514	SI_OIL
35-113-08536	5025W	P&A_INJ	35-113-08589	7305	P&A_INJ
35-113-08537	5027W	P&A_INJ	35-113-08590	7306W	P&A_INJ
35-113-08538	5121W	P&A_INJ	35-113-08591	7307	SI_OIL
35-113-08539	5123W	P&A_INJ	35-113-08592	7307W	P&A_INJ
35-113-08540	5122W	P&A_INJ	35-113-08593	7308	SI_OIL
35-113-08541	5125W	SI_WINJ	35-113-08594	7308W	SI_WINJ
35-113-08542	5127W	P&A_INJ	35-113-08595	7309	PA_PROD
35-113-08543	5821W	P&A_INJ	35-113-08596	7310W	SI_WINJ
35-113-08544	5917	SI_OIL	35-113-08597	7311	SI_OIL
35-113-08545	5921W	P&A_INJ	35-113-08598	7312W	SI_WINJ
35-113-08546	5923W	P&A_INJ	35-113-08599	7313	SI_OIL
35-113-08547	5925W	P&A_INJ	35-113-08600	7314	PA_PROD
35-113-08548	5926W	W_INJ	35-113-08601	7315	SI_OIL
35-113-08549	5927W	SI_WINJ	35-113-08602	7413	SI_OIL
35-113-08550	6611	SI_OIL	35-113-08603	7414	SI_OIL
35-113-08551	6601W	P&A_INJ	35-113-08604	8202	SI_OIL
35-113-08552	6602W	W_INJ	35-113-08605	8203	PA_PROD
35-113-08553	6604W	P&A_INJ	35-113-08606	8204W	SI_WINJ
35-113-08554	6703W	SI_WINJ	35-113-08607	8205	PA_PROD
35-113-08555	6705W	W_INJ	35-113-08608	8206W	SI_WINJ
35-113-08556	6707W	P&A_INJ	35-113-08609	8207	SI_OIL
35-113-08557	6709A	PA_PROD	35-113-08610	8208	PA_PROD
35-113-08558	5612	SI_OIL	35-113-08611	8208W	P&A_INJ
35-113-08559	5613	SI_OIL	35-113-08612	8301A	PA_PROD
35-113-08560	5614	PA_PROD	35-113-08613	8305W	SI_WINJ
35-113-08561	5624W	P&A_INJ	35-113-08614	8306W	SI_WINJ
35-113-08562	5628W	P&A_INJ	35-113-08615	8307A	SI_OIL
35-113-08563	5721W	P&A_INJ	35-113-08616	8307W	SI_WINJ
35-113-08564	5723W	P&A_INJ	35-113-08617	8308W	P&A_INJ
35-113-08565	6401W	W_INJ	35-113-08618	8301	PA_PROD
35-113-08566	6403W	SI_WINJ	35-113-08619	8302	PA_PROD
35-113-08567	6409	SI_OIL	35-113-08620	8303	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08621	8304	PA_PROD	35-113-08664	7608	PA_PROD
35-113-08622	8305	PA_PROD	35-113-08665	7609	PA_PROD
35-113-08623	8306	PA_PROD	35-113-08666	7610	PA_PROD
35-113-08624	8307	PA_PROD	35-113-08667	7611	PA_PROD
35-113-08625	8308	PA_PROD	35-113-08668	7612	PA_PROD
35-113-08626	8310	PA_PROD	35-113-08669	7613	PA_PROD
35-113-08627	8311	PA_PROD	35-113-08670	7614	SI_OIL
35-113-08628	8410	PA_PROD	35-113-08671	7615	PA_PROD
35-113-08629	8404	SI_OIL	35-113-08674	8502	PA_PROD
35-113-08630	8405	PA_PROD	35-113-08675	8503W	P&A_INJ
35-113-08632	8403	PA_PROD	35-113-08676	8504	SI_OIL
35-113-08633	8406	PA_PROD	35-113-08677	8505	PA_PROD
35-113-08634	8407	P&A_INJ	35-113-08678	8506	SI_OIL
35-113-08635	848	PA_PROD	35-113-08679	8507	PA_PROD
35-113-08635	8408	SI_OIL	35-113-08680	8508W	P&A_INJ
35-113-08637	8411	SI_OIL	35-113-08681	8509	PA_PROD
35-113-08638	7510	SI_OIL	35-113-08682	8510	PA_PROD
35-113-08639	7511	OIL	35-113-08683	8511	PA_PROD
35-113-08640	7512	SI_OIL	35-113-08684	8512	PA_PROD
35-113-08641	7602	PA_PROD	35-113-08685	8513	DRY
35-113-08641	7602A	OIL	35-113-08686	8514	PA_PROD
35-113-08643	7613A	OIL	35-113-08687	7501	PA_PROD
35-113-08644	7617	SI_OIL	35-113-08688	7502	PA_PROD
35-113-08645	7618	PA_PROD	35-113-08689	7503	DRY
35-113-08646	8301W	P&A_INJ	35-113-08690	7507	PA_PROD
35-113-08647	8405W	P&A_INJ	35-113-08691	7509	PA_PROD
35-113-08648	8406A	SI_OIL	35-113-08693	7508	PA_PROD
35-113-08649	8406W	W_INJ	35-113-08694	14201	PA_PROD
35-113-08650	8407W	W_INJ	35-113-08695	14202	DRY
35-113-08651	8417A	OIL	35-113-08696	14203	DRY
35-113-08652	8505W	P&A_INJ	35-113-08697	1309	SI_OIL
35-113-08653	8506W	W_INJ	35-113-08698	1301	PA_PROD
35-113-08654	8509W	P&A_INJ	35-113-08699	1302	PA_PROD
35-113-08655	8515	SI_OIL	35-113-08700	1303	PA_PROD
35-113-08656	8516	OIL	35-113-08701	1304	PA_PROD
35-113-08657	7601	PA_PROD	35-113-08703	1306	P&A_INJ
35-113-08659	7603	PA_PROD	35-113-08704	1307	PA_PROD
35-113-08660	7504	PA_PROD	35-113-08705	1310	PA_PROD
35-113-08661	7605	SI_OIL	35-113-08706	1313	P&A_INJ
35-113-08662	7606	PA_PROD	35-113-08707	2001	PA_PROD
35-113-08663	7607	PA_PROD	35-113-08708	2003	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08709	2004	SI_OIL	35-113-08763	3707	SI_OIL
35-113-08710	2005	PA_PROD	35-113-08764	3708	SI_OIL
35-113-08711	1906W	P&A_INJ	35-113-08765	3709	PA_PROD
35-113-08712	2007	PA_PROD	35-113-08766	3710	SI_OIL
35-113-08713	2008	PA_PROD	35-113-08767	3721W	SI_WINJ
35-113-08714	2009	SI_OIL	35-113-08768	3725W	SI_WINJ
35-113-08715	2010	PA_PROD	35-113-08769	3726W	P&A_INJ
35-113-08716	2011	SI_OIL	35-113-08770	3703	PA_PROD
35-113-08717	2013	PA_PROD	35-113-08771	3704	P&A_INJ
35-113-08718	2014	SI_OIL	35-113-08772	3705W	SI_WINJ
35-113-08719	1907	PA_PROD	35-113-08773	3706	PA_PROD
35-113-08720	1908	PA_PROD	35-113-08777	3532	UNKNW
35-113-08721	1911	SI_OIL	35-113-08778	2721W	P&A_INJ
35-113-08722	1912	SI_OIL	35-113-08779	2722W	P&A_INJ
35-113-08723	1915	PA_PROD	35-113-08780	2723W	P&A_INJ
35-113-08724	1916	PA_PROD	35-113-08781	2724W	SI_WINJ
35-113-08725	1321W	P&A_INJ	35-113-08782	2725W	P&A_INJ
35-113-08726	1322W	P&A_INJ	35-113-08783	2726W	SI_WINJ
35-113-08727	1323W	P&A_INJ	35-113-08784	2727W	SI_WINJ
35-113-08728	1324W	P&A_INJ	35-113-08785	2728W	P&A_INJ
35-113-08729	1325W	P&A_INJ	35-113-08786	2801A	PA_PROD
35-113-08730	1921W	P&A_INJ	35-113-08787	2821W	P&A_INJ
35-113-08731	1922W	SI_WINJ	35-113-08788	2822W	P&A_INJ
35-113-08732	1923W	P&A_INJ	35-113-08789	2823W	P&A_INJ
35-113-08733	1924W	P&A_INJ	35-113-08790	2824W	P&A_INJ
35-113-08734	1925	P&A_INJ	35-113-08791	2825W	P&A_INJ
35-113-08735	1926W	SI_WINJ	35-113-08792	2826W	P&A_INJ
35-113-08736	1927W	P&A_INJ	35-113-08793	2827W	P&A_INJ
35-113-08737	1928W	P&A_INJ	35-113-08794	2828W	P&A_INJ
35-113-08738	2002	SI_OIL	35-113-08795	3521W	SI_WINJ
35-113-08739	20W21	P&A_INJ	35-113-08796	3523W	P&A_INJ
35-113-08740	20W22	P&A_INJ	35-113-08797	3525W	P&A_INJ
35-113-08741	20W24	P&A_INJ	35-113-08798	3527W	SI_WINJ
35-113-08742	20W25	P&A_INJ	35-113-08799	3616	SI_OIL
35-113-08743	2101	PA_PROD	35-113-08800	3621W	P&A_INJ
35-113-08744	2102	DRY	35-113-08801	3622W	P&A_INJ
35-113-08745	2103	PA_PROD	35-113-08802	3624W	SI_WINJ
35-113-08759	2921W	P&A_INJ	35-113-08803	3625W	SI_WINJ
35-113-08760	2922W	P&A_INJ	35-113-08804	3627W	P&A_INJ
35-113-08761	2923W	P&A_INJ	35-113-08805	3628W	P&A_INJ
35-113-08762	2925W	P&A_INJ	35-113-08806	2701	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08807	2702	SI_OIL	35-113-08850	4301	SI_OIL
35-113-08808	2703A	PA_PROD	35-113-08851	4302	OIL
35-113-08809	2704	SI_OIL	35-113-08852	4303	SI_OIL
35-113-08810	2705	P&A_INJ	35-113-08853	4304	OIL
35-113-08811	2706	PA_PROD	35-113-08854	4305	PA_PROD
35-113-08812	2708	PA_PROD	35-113-08856	4307	PA_PROD
35-113-08813	2709	TA_OIL	35-113-08857	4308	PA_PROD
35-113-08814	2710	PA_PROD	35-113-08858	4309	PA_PROD
35-113-08815	2711	PA_PROD	35-113-08859	4310	PA_PROD
35-113-08816	2712	PA_PROD	35-113-08860	4311	SI_OIL
35-113-08817	3501	PA_PROD	35-113-08861	4312	DRY
35-113-08818	3502	PA_PROD	35-113-08862	2713A	SI_OIL
35-113-08819	3503	SI_OIL	35-113-08863	4313	OIL
35-113-08820	3504	SI_OIL	35-113-08864	4315	PA_PROD
35-113-08821	3505	PA_PROD	35-113-08865	4316	PA_PROD
35-113-08822	3506	PA_PROD	35-113-08866	4314	SI_OIL
35-113-08823	3507	PA_PROD	35-113-08866	4314A	OIL
35-113-08824	3508	PA_PROD	35-113-08867	4322W	W_INJ
35-113-08825	3509	PA_PROD	35-113-08868	4324W	W_INJ
35-113-08826	3510	PA_PROD	35-113-08869	4325W	W_INJ
35-113-08827	3511	SI_OIL	35-113-08870	4327W	SI_WINJ
35-113-08828	3512	PA_PROD	35-113-08871	4422W	P&A_INJ
35-113-08829	3513W	P&A_INJ	35-113-08872	4424W	SI_WINJ
35-113-08830	3514	PA_PROD	35-113-08873	4425W	SI_WINJ
35-113-08831	3515	PA_PROD	35-113-08874	4426W	W_INJ
35-113-08832	3516	PA_PROD	35-113-08875	4428W	P&A_INJ
35-113-08833	5301A	SI_OIL	35-113-08876	5221W	P&A_INJ
35-113-08834	5301	PA_PROD	35-113-08877	5222W	P&A_INJ
35-113-08835	5302	OIL	35-113-08878	5223W	W_INJ
35-113-08836	5303	SI_OIL	35-113-08879	5224W	P&A_INJ
35-113-08837	5304	PA_PROD	35-113-08880	5225W	P&A_INJ
35-113-08838	5305	SI_OIL	35-113-08881	5227W	P&A_INJ
35-113-08839	5306W	P&A_INJ	35-113-08882	5304A	OIL
35-113-08840	5307	PA_PROD	35-113-08883	5321W	P&A_INJ
35-113-08841	5308W	P&A_INJ	35-113-08884	5322W	SI_WINJ
35-113-08843	5310	PA_PROD	35-113-08885	5323W	P&A_INJ
35-113-08845	5312	SI_OIL	35-113-08886	5324W	P&A_INJ
35-113-08846	5313	PA_PROD	35-113-08887	5325W	W_INJ
35-113-08847	5314	PA_PROD	35-113-08888	5327W	P&A_INJ
35-113-08848	5315	OIL	35-113-08889	4401	SI_OIL
35-113-08849	5316	PA_PROD	35-113-08890	4402	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08891	4403	PA_PROD	35-113-08939	5410	PA_PROD
35-113-08892	4404	PA_PROD	35-113-08940	5411	PA_PROD
35-113-08893	4405	PA_PROD	35-113-08941	5412	PA_PROD
35-113-08894	4406	PA_PROD	35-113-08942	5413	PA_PROD
35-113-08895	4407W	P&A_INJ	35-113-08943	5414	PA_PROD
35-113-08896	4408	PA_PROD	35-113-08944	5415	PA_PROD
35-113-08897	4409	SI_OIL	35-113-08945	5416	PA_PROD
35-113-08898	4410	SI_OIL	35-113-08970	7201	PA_PROD
35-113-08899	4411	PA_PROD	35-113-08971	7202	PA_PROD
35-113-08900	4411A	PA_PROD	35-113-08972	7203	PA_PROD
35-113-08901	4412	SI_OIL	35-113-08973	7204	PA_PROD
35-113-08902	4413	SI_OIL	35-113-08974	7205	PA_PROD
35-113-08903	4414	SI_OIL	35-113-08975	6	PA_PROD
35-113-08904	4414A	PA_PROD	35-113-08976	7208	PA_PROD
35-113-08905	4415	PA_PROD	35-113-08977	7209	PA_PROD
35-113-08913	4502A	SI_OIL	35-113-08978	7210	PA_PROD
35-113-08914	4508	PA_PROD	35-113-08979	1	PA_PROD
35-113-08915	4509	SI_OIL	35-113-08980	2	SI_OIL
35-113-08916	4521W	SI_WINJ	35-113-09001	7	SI_OIL
35-113-08917	4522W	P&A_INJ	35-113-09002	7201W	P&A_INJ
35-113-08918	4524W	SI_WINJ	35-113-09003	7205W	P&A_INJ
35-113-08919	4526W	SI_WINJ	35-113-09004	7209A	PA_PROD
35-113-08920	5404A	PA_PROD	35-113-09005	6201	PA_PROD
35-113-08921	5405A	PA_PROD	35-113-09006	6202	PA_PROD
35-113-08922	5410A	PA_PROD	35-113-09007	6203	PA_PROD
35-113-08923	5421W	P&A_INJ	35-113-09008	6204	PA_PROD
35-113-08924	5422W	P&A_INJ	35-113-09009	6205	PA_PROD
35-113-08925	5423W	P&A_INJ	35-113-09010	6206	PA_PROD
35-113-08926	5424W	P&A_INJ	35-113-09011	6207	PA_PROD
35-113-08927	5425W	P&A_INJ	35-113-09012	6208	PA_PROD
35-113-08928	5427W	P&A_INJ	35-113-09013	6209	PA_PROD
35-113-08929	5521W	P&A_INJ	35-113-09014	6210	PA_PROD
35-113-08930	5525W	P&A_INJ	35-113-09016	6212	PA_PROD
35-113-08931	5401	PA_PROD	35-113-09017	6213	PA_PROD
35-113-08932	5402	PA_PROD	35-113-09018	6214	PA_PROD
35-113-08933	5403	PA_PROD	35-113-09019	6215	PA_PROD
35-113-08934	5404	PA_PROD	35-113-09020	6216	PA_PROD
35-113-08935	5405	PA_PROD	35-113-09021	6221W	P&A_INJ
35-113-08936	5406	PA_PROD	35-113-09022	6222W	P&A_INJ
35-113-08937	5407	PA_PROD	35-113-09023	6223W	P&A_INJ
35-113-08938	5409	P&A_INJ	35-113-09024	6224W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09025	6225W	P&A_INJ	35-113-09066	7003	PA_PROD
35-113-09026	6226W	P&A_INJ	35-113-09067	7004	PA_PROD
35-113-09027	6227W	P&A_INJ	35-113-09068	7005	PA_PROD
35-113-09028	6228W	P&A_INJ	35-113-09069	7006	PA_PROD
35-113-09029	6308	PA_PROD	35-113-09070	7007	PA_PROD
35-113-09030	6321W	P&A_INJ	35-113-09071	7008	PA_PROD
35-113-09031	6322W	P&A_INJ	35-113-09072	7009	PA_PROD
35-113-09032	6325W	P&A_INJ	35-113-09073	7010	PA_PROD
35-113-09033	7001A	SI_OIL	35-113-09074	7011	PA_PROD
35-113-09034	7001W	P&A_INJ	35-113-09075	7012	PA_PROD
35-113-09035	7002W	P&A_INJ	35-113-09076	7013	PA_PROD
35-113-09036	7003W	P&A_INJ	35-113-09077	7014	P&A_INJ
35-113-09037	7004W	P&A_INJ	35-113-09078	7015	PA_PROD
35-113-09038	7005W	P&A_INJ	35-113-09079	7016	PA_PROD
35-113-09039	7006W	P&A_INJ	35-113-09080	6301	PA_PROD
35-113-09040	7007W	SI_WINJ	35-113-09081	6021W	P&A_INJ
35-113-09041	7008W	P&A_INJ	35-113-09082	6022W	P&A_INJ
35-113-09042	7013A	SI_OIL	35-113-09083	6024W	SI_WINJ
35-113-09043	7101W	P&A_INJ	35-113-09084	6025W	SI_WINJ
35-113-09044	7102W	P&A_INJ	35-113-09085	6026W	SI_WINJ
35-113-09045	7103W	P&A_INJ	35-113-09086	6028W	W_INJ
35-113-09046	7104W	P&A_INJ	35-113-09087	6121W	W_INJ
35-113-09047	7105W	P&A_INJ	35-113-09088	6122W	SI_WINJ
35-113-09048	7106W	P&A_INJ	35-113-09089	6123W	P&A_INJ
35-113-09049	7107W	P&A_INJ	35-113-09090	6124W	SI_WINJ
35-113-09050	708	PA_PROD	35-113-09091	6125W	P&A_INJ
35-113-09051	7101	PA_PROD	35-113-09092	4306	PA_PROD
35-113-09052	7102	PA_PROD	35-113-09093	6126W	W_INJ
35-113-09053	7103	PA_PROD	35-113-09094	6127W	SI_WINJ
35-113-09054	7104	PA_PROD	35-113-09095	6128W	P&A_INJ
35-113-09055	7105	PA_PROD	35-113-09096	6801W	SI_WINJ
35-113-09056	7106	SI_OIL	35-113-09097	6802W	SI_WINJ
35-113-09057	7107	PA_PROD	35-113-09098	6803W	SI_WINJ
35-113-09058	7108	PA_PROD	35-113-09099	6804W	P&A_INJ
35-113-09059	7109	PA_PROD	35-113-09100	6805W	P&A_INJ
35-113-09060	7110	P&A_INJ	35-113-09101	6806W	P&A_INJ
35-113-09061	7111	SI_OIL	35-113-09102	6807W	P&A_INJ
35-113-09062	7112	PA_PROD	35-113-09103	6808W	SI_WINJ
35-113-09063	7113	PA_PROD	35-113-09104	6901W	P&A_INJ
35-113-09064	7001	PA_PROD	35-113-09105	6902W	SI_WINJ
35-113-09065	7002	PA_PROD	35-113-09106	6903W	SI_WINJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09107	69W4	SI_WINJ	35-113-09149	6807	PA_PROD
35-113-09108	6905W	SI_WINJ	35-113-09150	6813	PA_PROD
35-113-09109	6906W	P&A_INJ	35-113-09151	6805	PA_PROD
35-113-09110	6907W	P&A_INJ	35-113-09152	6808	PA_PROD
35-113-09111	6908W	P&A_INJ	35-113-09153	6809	PA_PROD
35-113-09112	6101	PA_PROD	35-113-09154	6810	SI_OIL
35-113-09113	6102	OIL	35-113-09155	6811W	P&A_INJ
35-113-09114	6103	PA_PROD	35-113-09156	6812	PA_PROD
35-113-09115	6104	SI_OIL	35-113-09157	6814	PA_PROD
35-113-09116	6105	PA_PROD	35-113-09158	6815	PA_PROD
35-113-09117	6106	PA_PROD	35-113-09159	6816	PA_PROD
35-113-09118	6107	PA_PROD	35-113-09160	6817	PA_PROD
35-113-09119	6108	PA_PROD	35-113-09161	8601	PA_PROD
35-113-09120	6109	PA_PROD	35-113-09162	8602	PA_PROD
35-113-09121	6110	PA_PROD	35-113-09163	8603	PA_PROD
35-113-09122	6111	SI_OIL	35-113-09164	8604	PA_PROD
35-113-09124	6113	PA_PROD	35-113-09165	8606	OIL
35-113-09125	6114	PA_PROD	35-113-09166	8607	PA_PROD
35-113-09126	6115	PA_PROD	35-113-09167	8608	PA_PROD
35-113-09127	6116	PA_PROD	35-113-09168	8609	SI_OIL
35-113-09128	6901	PA_PROD	35-113-09169	8610	PA_PROD
35-113-09129	6902	SI_OIL	35-113-09170	8611	PA_PROD
35-113-09130	6903	SI_OIL	35-113-09171	8612	PA_PROD
35-113-09131	6904	PA_PROD	35-113-09172	8613	PA_PROD
35-113-09132	6905	PA_PROD	35-113-09173	8614	PA_PROD
35-113-09133	6906	PA_PROD	35-113-09174	8615	P&A_INJ
35-113-09134	6907	SI_OIL	35-113-09175	8616	P&A_INJ
35-113-09135	6908	PA_PROD	35-113-09176	8701	PA_PROD
35-113-09136	6909	PA_PROD	35-113-09177	8702	PA_PROD
35-113-09137	6910	PA_PROD	35-113-09179	8704	PA_PROD
35-113-09138	6911	PA_PROD	35-113-09180	8705	PA_PROD
35-113-09139	6912	PA_PROD	35-113-09181	8706	PA_PROD
35-113-09140	6913	PA_PROD	35-113-09182	8707	PA_PROD
35-113-09141	6914	SI_OIL	35-113-09183	8708	PA_PROD
35-113-09142	6915	SI_OIL	35-113-09184	8709	PA_PROD
35-113-09143	6916	PA_PROD	35-113-09185	8710	SI_OIL
35-113-09144	6801	PA_PROD	35-113-09186	8711	P&A_INJ
35-113-09145	6802	SI_OIL	35-113-09187	8712	PA_PROD
35-113-09146	6803	PA_PROD	35-113-09188	8613	PA_PROD
35-113-09147	6804	PA_PROD	35-113-09188	8713	OIL
35-113-09148	6806	PA_PROD	35-113-09189	8714	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09190	8715	PA_PROD	35-113-09232	7710	PA_PROD
35-113-09191	8716	P&A_INJ	35-113-09233	7706	PA_PROD
35-113-09192	7801	PA_PROD	35-113-09234	7713	PA_PROD
35-113-09193	7802	PA_PROD	35-113-09235	867	SI_OIL
35-113-09194	7803A	SI_OIL	35-113-09236	8801	SI_OIL
35-113-09195	7804	OIL	35-113-09237	8802	PA_PROD
35-113-09196	7805	PA_PROD	35-113-09238	8803	PA_PROD
35-113-09197	7806	PA_PROD	35-113-09239	8804	PA_PROD
35-113-09198	7807	PA_PROD	35-113-09240	8805	PA_PROD
35-113-09199	7808	SI_OIL	35-113-09241	8806	SI_OIL
35-113-09200	7809	SI_OIL	35-113-09242	8807	PA_PROD
35-113-09201	7810	OIL	35-113-09243	8808	SI_OIL
35-113-09202	7811	SI_OIL	35-113-09244	8809	PA_PROD
35-113-09203	7812	SI_OIL	35-113-09245	8810	P&A_INJ
35-113-09204	7813	OIL	35-113-09246	8811	PA_PROD
35-113-09205	7814	PA_PROD	35-113-09247	8812	PA_PROD
35-113-09206	7815	P&A_INJ	35-113-09248	8813	OIL
35-113-09207	7816	SI_OIL	35-113-09249	8814	PA_PROD
35-113-09208	771A	PA_PROD	35-113-09250	8815	PA_PROD
35-113-09209	7702A	SI_OIL	35-113-09251	8816	PA_PROD
35-113-09210	7704A	SI_OIL	35-113-09252	7901	PA_PROD
35-113-09211	7708	SI_OIL	35-113-09253	7902	PA_PROD
35-113-09212	7717	SI_OIL	35-113-09254	7903	PA_PROD
35-113-09213	8616A	SI_OIL	35-113-09255	7904	PA_PROD
35-113-09214	8617	OIL	35-113-09256	7905A	PA_PROD
35-113-09215	8605W	W_INJ	35-113-09257	7906	PA_PROD
35-113-09216	8606W	SI_WINJ	35-113-09258	8807	SI_OIL
35-113-09217	8607W	SI_WINJ	35-113-09259	7908	SI_OIL
35-113-09218	8608W	P&A_INJ	35-113-09260	7909	SI_OIL
35-113-09219	7701	PA_PROD	35-113-09261	7910	PA_PROD
35-113-09220	7702	PA_PROD	35-113-09262	7911	SI_OIL
35-113-09221	7703	PA_PROD	35-113-09263	7912	SI_OIL
35-113-09222	7705	PA_PROD	35-113-09264	7913	SI_OIL
35-113-09223	7707	PA_PROD	35-113-09265	7914	PA_PROD
35-113-09225	7709	PA_PROD	35-113-09266	7915	P&A_INJ
35-113-09226	7711W	W_INJ	35-113-09267	7916	SI_OIL
35-113-09227	7712	SI_OIL	35-113-09268	8007A	SI_OIL
35-113-09228	7714	PA_PROD	35-113-09269	8807W	SI_WINJ
35-113-09229	7715	PA_PROD	35-113-09270	8809A	PA_PROD
35-113-09230	7716	PA_PROD	35-113-09271	8903A	SI_OIL
35-113-09231	7704	PA_PROD	35-113-09272	8905A	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09273	8905W	SI_WINJ	35-113-09318	9003	PA_PROD
35-113-09274	8906W	W_INJ	35-113-09319	9004	PA_PROD
35-113-09275	8907W	SI_WINJ	35-113-09320	9005	PA_PROD
35-113-09276	8901	PA_PROD	35-113-09321	9006	P&A_INJ
35-113-09277	8902	PA_PROD	35-113-09322	9007	PA_PROD
35-113-09278	8903	PA_PROD	35-113-09323	9008	SI_OIL
35-113-09279	8904	PA_PROD	35-113-09324	9009	SI_OIL
35-113-09280	8905	PA_PROD	35-113-09325	9010	PA_PROD
35-113-09281	8906	SI_OIL	35-113-09326	9011	PA_PROD
35-113-09282	8907	PA_PROD	35-113-09327	9012	OIL
35-113-09283	8908	PA_PROD	35-113-09328	9013	P&A_INJ
35-113-09284	8909	PA_PROD	35-113-09329	9014	SI_OIL
35-113-09285	8910	PA_PROD	35-113-09330	9015	SI_OIL
35-113-09286	8911	SI_OIL	35-113-09331	9016	PA_PROD
35-113-09287	8912	PA_PROD	35-113-09332	8101	PA_PROD
35-113-09288	8913	PA_PROD	35-113-09333	812	PA_PROD
35-113-09289	8914	PA_PROD	35-113-09334	8103	P&A_INJ
35-113-09290	8915	OIL	35-113-09335	8104	SI_OIL
35-113-09291	8916	PA_PROD	35-113-09336	8105	PA_PROD
35-113-09292	8003	SI_OIL	35-113-09337	8106	PA_PROD
35-113-09293	8004	PA_PROD	35-113-09338	8107	SI_OIL
35-113-09294	8005	PA_PROD	35-113-09339	8108	PA_PROD
35-113-09295	8006	SI_OIL	35-113-09340	8109	PA_PROD
35-113-09296	8007	PA_PROD	35-113-09341	8110	PA_PROD
35-113-09297	8008A	PA_PROD	35-113-09342	8111	PA_PROD
35-113-09298	8009	PA_PROD	35-113-09343	8112	P&A_INJ
35-113-09299	8010	PA_PROD	35-113-09971	610	OIL
35-113-09300	8011	SI_OIL	35-113-09972	602	OIL
35-113-09301	8012	OIL	35-113-09973	603	OIL
35-113-09302	8013	OIL	35-113-09974	605	PA_PROD
35-113-09303	8014	PA_PROD	35-113-09975	607	PA_PROD
35-113-09308	8113A	SI_OIL	35-113-09976	608	PA_PROD
35-113-09309	9006W	SI_WINJ	35-113-09977	609	OIL
35-113-09310	9007W	P&A_INJ	35-113-09979	604	OIL
35-113-09311	14301	PA_PROD	35-113-09980	606	P&A_INJ
35-113-09312	14302	PA_PROD	35-113-09983	961A	SI_OIL
35-113-09313	14303	PA_PROD	35-113-10648	7505	PA_PROD
35-113-09314	14304	PA_PROD	35-113-10649	752	PA_PROD
35-113-09315	14305	PA_PROD	35-113-10650	5508	DRY
35-113-09316	9001	PA_PROD	35-113-20605	3017	OIL
35-113-09317	9002	PA_PROD	35-113-21008	8717	OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-21339	1018	WAG	35-113-31831	9316	PA_PROD
35-113-21699	6613	OIL	35-113-31832	10101	PA_PROD
35-113-22373	10518D	SI_SWD	35-113-31833	10102	PA_PROD
35-113-22414	9732W	W_INJ	35-113-31834	10103	PA_PROD
35-113-22415	11401B	DRY	35-113-31835	10104	PA_PROD
35-113-22420	9723	SI_OIL	35-113-31836	10105	PA_PROD
35-113-22421	9724	SI_OIL	35-113-31837	10107	SI_OIL
35-113-22422	9729	SI_OIL	35-113-31838	10108	PA_PROD
35-113-22423	9735	SI_OIL	35-113-31839	10109	PA_PROD
35-113-22424	9736	SI_OIL	35-113-31840	10110	PA_PROD
35-113-22433	9730W	SI_WINJ	35-113-31841	10111	PA_PROD
35-113-22453	9731W	SI_WINJ	35-113-31842	10112	PA_PROD
35-113-22454	9733	OIL	35-113-31842	10112A	SI_OIL
35-113-22455	9734	SI_OIL	35-113-31844	10114	P&A_INJ
35-113-22495	9728	SI_OIL	35-113-31845	10115	PA_PROD
35-113-22507	9717	SI_OIL	35-113-31847	9202	SI_OIL
35-113-22508	9721	SI_OIL	35-113-31848	9203	PA_PROD
35-113-22509	9722	SI_OIL	35-113-31849	9204	PA_PROD
35-113-22539	7619	OIL	35-113-31850	9205	SI_OIL
35-113-25173	3429	OIL	35-113-31851	9206	SI_OIL
35-113-25310	5030	TA_OIL	35-113-31852	9207	PA_PROD
35-113-25336	5131	SI_OIL	35-113-31853	9208	PA_PROD
35-113-25337	5132	SI_OIL	35-113-31854	9209	PA_PROD
35-113-25359	5229	SI_OIL	35-113-31855	9210	SI_OIL
35-113-25360	5230	SI_OIL	35-113-31856	9211	P&A_INJ
35-113-25376	5228	OIL	35-113-31857	9212	SI_OIL
35-113-26892	43836	DRY	35-113-31858	9213	SI_OIL
35-113-26925	5233W	W_INJ	35-113-31859	9214	PA_PROD
35-113-31081	14201A	SI_OIL	35-113-31860	9215	OIL
35-113-31201	11902W	P&A_INJ	35-113-31861	9216	PA_PROD
35-113-31201	12016AW	SI_OIL	35-113-31862	10001	PA_PROD
35-113-31270	105	SI_OIL	35-113-31863	10002	SI_OIL
35-113-31821	9301	PA_PROD	35-113-31864	10003	PA_PROD
35-113-31823	9304	SI_OIL	35-113-31865	10004	PA_PROD
35-113-31823	9304A	PA_PROD	35-113-31866	10005	PA_PROD
35-113-31824	9305	PA_PROD	35-113-31867	10006	PA_PROD
35-113-31825	9306	SI_OIL	35-113-31868	10007	PA_PROD
35-113-31826	9307	PA_PROD	35-113-31870	10008	PA_PROD
35-113-31827	9309	PA_PROD	35-113-31871	10009	PA_PROD
35-113-31829	9313	P&A_INJ	35-113-31872	10010	PA_PROD
35-113-31830	9315	PA_PROD	35-113-31873	10015	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-31874	10016	PA_PROD	35-113-31967	10604	PA_PROD
35-113-31875	9201W	SI_WINJ	35-113-31968	9801W	P&A_INJ
35-113-31876	10101W	P&A_INJ	35-113-31969	9901W	P&A_INJ
35-113-31877	9202W	P&A_INJ	35-113-31970	9802W	P&A_INJ
35-113-31878	101WI	P&A_INJ	35-113-31971	9902W	P&A_INJ
35-113-31879	9203W	SI_WINJ	35-113-31972	9803W	P&A_INJ
35-113-31880	9303A	PA_PROD	35-113-31973	9804W	P&A_INJ
35-113-31881	10003W	SI_WINJ	35-113-31974	9805W	P&A_INJ
35-113-31882	10103W	P&A_INJ	35-113-31975	9806W	P&A_INJ
35-113-31883	9204W	SI_WINJ	35-113-31976	106W6	P&A_INJ
35-113-31884	10004W	SI_WINJ	35-113-31977	10706W	DRY
35-113-31885	10104W	P&A_INJ	35-113-31978	9807W	P&A_INJ
35-113-31886	9205W	SI_WINJ	35-113-31979	106W8	P&A_INJ
35-113-31887	10005W	P&A_INJ	35-113-31980	10401	PA_PROD
35-113-31888	10105W	P&A_INJ	35-113-31981	10402	PA_PROD
35-113-31889	9206W	P&A_INJ	35-113-31982	10403	PA_PROD
35-113-31890	10006W	P&A_INJ	35-113-31983	10404	SI_OIL
35-113-31891	9207W	P&A_INJ	35-113-31984	10405	PA_PROD
35-113-31892	10007W	SI_WINJ	35-113-31985	10406	PA_PROD
35-113-31893	10107W	TA_INJ	35-113-31986	10407	PA_PROD
35-113-31894	10008W	P&A_INJ	35-113-31987	10408	PA_PROD
35-113-31895	10108W	W_INJ	35-113-31988	10409	PA_PROD
35-113-31896	10116	PA_PROD	35-113-31989	10410	PA_PROD
35-113-31897	9104A	PA_PROD	35-113-31990	10411	SI_OIL
35-113-31898	9107W	P&A_INJ	35-113-31991	10412	PA_PROD
35-113-31899	9108W	P&A_INJ	35-113-31992	10413	SI_OIL
35-113-31901	9106	PA_PROD	35-113-31993	10414	SI_OIL
35-113-31902	9107	PA_PROD	35-113-31994	10415	P&A_INJ
35-113-31909	10806W	P&A_INJ	35-113-31995	10416	PA_PROD
35-113-31910	10807W	P&A_INJ	35-113-31996	9701	OIL
35-113-31911	10808W	SI_WINJ	35-113-31997	9702	PA_PROD
35-113-31955	9901	PA_PROD	35-113-31998	9703	PA_PROD
35-113-31956	9902	PA_PROD	35-113-31999	9704	PA_PROD
35-113-31957	9903	PA_PROD	35-113-32000	9705	PA_PROD
35-113-31958	9904	PA_PROD	35-113-32001	9706	SI_OIL
35-113-31959	9905	PA_PROD	35-113-32002	9707	PA_PROD
35-113-31962	9907	PA_PROD	35-113-32003	9708	SI_OIL
35-113-31963	9908	PA_PROD	35-113-32004	9709	SI_OIL
35-113-31964	9909	PA_PROD	35-113-32005	9710	PA_PROD
35-113-31965	9910	P&A_INJ	35-113-32006	9711	P&A_INJ
35-113-31966	10601	PA_PROD	35-113-32007	9712	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-32008	9713	PA_PROD	35-113-32047	10202	PA_PROD
35-113-32009	9714	PA_PROD	35-113-32048	10301	DRY
35-113-32010	975	PA_PROD	35-113-32048	10301A	PA_PROD
35-113-32011	9716	PA_PROD	35-113-32049	10302	SI_OIL
35-113-32012	10504W	UNKNW	35-113-32050	10304	PA_PROD
35-113-32013	9601W	SI_WINJ	35-113-32051	10305	PA_PROD
35-113-32014	9718W	SI_WINJ	35-113-32052	10306A	SI_OIL
35-113-32015	10401W	SI_WINJ	35-113-32053	10307	PA_PROD
35-113-32016	10501W	P&A_INJ	35-113-32054	10308	PA_PROD
35-113-32017	9602A	PA_PROD	35-113-32055	10309	OIL
35-113-32018	9702W	P&A_INJ	35-113-32056	10310	PA_PROD
35-113-32019	10402W	P&A_INJ	35-113-32057	10311	PA_PROD
35-113-32020	10502W	P&A_INJ	35-113-32058	10312	PA_PROD
35-113-32021	9603W	P&A_INJ	35-113-32059	10313	PA_PROD
35-113-32022	9703W	P&A_INJ	35-113-32060	10314	PA_PROD
35-113-32023	10403W	P&A_INJ	35-113-32061	10315W	P&A_INJ
35-113-32024	10503W	W_INJ	35-113-32062	10201W	P&A_INJ
35-113-32025	9604W	SI_WINJ	35-113-32063	10301W	P&A_INJ
35-113-32026	9704W	P&A_INJ	35-113-32064	10202W	P&A_INJ
35-113-32027	10404W	W_INJ	35-113-32065	10302W	P&A_INJ
35-113-32028	9605W	SI_WINJ	35-113-32066	9503W	SI_WINJ
35-113-32029	9705W	P&A_INJ	35-113-32067	10203W	SI_WINJ
35-113-32030	10405W	SI_WINJ	35-113-32068	10303W	P&A_INJ
35-113-32031	10505W	SI_WINJ	35-113-32069	9504W	W_INJ
35-113-32032	9606W	SI_WINJ	35-113-32070	10204W	P&A_INJ
35-113-32033	9706W	P&A_INJ	35-113-32071	10304W	SI_WINJ
35-113-32034	10406W	P&A_INJ	35-113-32072	9505W	W_INJ
35-113-32035	10506W	SI_WINJ	35-113-32073	10205W	W_INJ
35-113-32036	9607W	SI_WINJ	35-113-32074	10305W	P&A_INJ
35-113-32037	9707W	P&A_INJ	35-113-32075	9506A	PA_PROD
35-113-32038	10407W	SI_WINJ	35-113-32076	9506W	P&A_INJ
35-113-32039	10507W	W_INJ	35-113-32077	10206W	W_INJ
35-113-32040	9608A	SI_OIL	35-113-32078	10306	SI_OIL
35-113-32041	9608W	P&A_INJ	35-113-32079	10306W	P&A_INJ
35-113-32042	9708W	P&A_INJ	35-113-32080	9507W	W_INJ
35-113-32043	10408W	SI_WINJ	35-113-32081	10207W	SI_WINJ
35-113-32044	10408A	OIL	35-113-32082	10307W	P&A_INJ
35-113-32045	10508W	W_INJ	35-113-32083	9508W	P&A_INJ
35-113-32046	1021	PA_PROD	35-113-32084	10208W	P&A_INJ
35-113-32046	10201	PA_PROD	35-113-32085	10308W	P&A_INJ
35-113-32046	10201A	PA_PROD	35-113-32086	10314A	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-32087	10217D	SI_WINJ	35-113-32173	12816W	P&A_INJ
35-113-32088	11601	PA_PROD	35-113-32174	12701W	P&A_INJ
35-113-32089	11602	P&A_INJ	35-113-32175	12702W	P&A_INJ
35-113-32090	11001	PA_PROD	35-113-32176	12703W	P&A_INJ
35-113-32091	11002	PA_PROD	35-113-32177	12705W	P&A_INJ
35-113-32092	11003	PA_PROD	35-113-32178	12706W	P&A_INJ
35-113-32093	11004	PA_PROD	35-113-32179	12707W	P&A_INJ
35-113-32094	11005	PA_PROD	35-113-32180	12708W	P&A_INJ
35-113-32095	11006W	SI_WINJ	35-113-32181	12709W	P&A_INJ
35-113-32096	11007	OIL	35-113-32182	12717	SI_WTR_SRVC
35-113-32097	11008	SI_OIL	35-113-32184	14403A	SI_OIL
35-113-32098	10905W	P&A_INJ	35-113-32185	14410	SI_OIL
35-113-32099	11005W	P&A_INJ	35-113-32186	14411	SI_OIL
35-113-32100	10906W	P&A_INJ	35-113-32188	12601A	PA_PROD
35-113-32102	10907W	P&A_INJ	35-113-32192	14404A	SI_OIL
35-113-32103	10908	P&A_INJ	35-113-32193	14405A	PA_PROD
35-113-32104	10928W	SI_WINJ	35-113-32194	14407W	W_INJ
35-113-32105	10912	PA_PROD	35-113-32220	13212	PA_PROD
35-113-32106	11407AW	PA_PROD	35-113-32221	13214W	P&A_INJ
35-113-32107	11008W	P&A_INJ	35-113-32222	13215	SI_OIL
35-113-32108	11009W	SI_WINJ	35-113-32223	13216	PA_PROD
35-113-32109	11010	PA_PROD	35-113-32229	13411W	P&A_INJ
35-113-32110	11106W	P&A_INJ	35-113-32230	13412	SI_OIL
35-113-32111	11206	PA_PROD	35-113-32231	13413	PA_PROD
35-113-32112	11108W	P&A_INJ	35-113-32232	13301W	SI_WINJ
35-113-32113	11208W	P&A_INJ	35-113-32233	13302	P&A_INJ
35-113-32114	11110W	W_INJ	35-113-32234	13303W	P&A_INJ
35-113-32115	11112W	P&A_INJ	35-113-32235	13304	PA_PROD
35-113-32116	11205W	SI_WINJ	35-113-32236	13308W	P&A_INJ
35-113-32117	11708	OIL	35-113-32237	13309W	P&A_INJ
35-113-32118	11908W	P&A_INJ	35-113-32238	13310	PA_PROD
35-113-32119	11411W	P&A_INJ	35-113-32239	13311W	P&A_INJ
35-113-32120	11914	OIL	35-113-32240	13312	SI_OIL
35-113-32121	11307AW	P&A_INJ	35-113-32241	13313	PA_PROD
35-113-32122	1203A	PA_PROD	35-113-32242	13314W	P&A_INJ
35-113-32123	11306A	P&A_INJ	35-113-32243	13315	PA_PROD
35-113-32167	9312	PA_PROD	35-113-32244	13316W	P&A_INJ
35-113-32169	14502W	P&A_INJ	35-113-32245	13101	PA_PROD
35-113-32170	14504W	P&A_INJ	35-113-32246	13401	SI_OIL
35-113-32171	12415	PA_PROD	35-113-32247	13102W	P&A_INJ
35-113-32172	12815W	P&A_INJ	35-113-32248	13402	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-32249	13103	PA_PROD	35-113-32373	13702W	P&A_INJ
35-113-32250	13403W	P&A_INJ	35-113-32374	13703	SI_OIL
35-113-32251	13104W	P&A_INJ	35-113-32375	13704W	SI_WINJ
35-113-32252	13404	SI_OIL	35-113-32376	13705	SI_OIL
35-113-32253	13105	P&A_INJ	35-113-32377	13707W	P&A_INJ
35-113-32254	13405W	P&A_INJ	35-113-32378	13708	PA_PROD
35-113-32255	13406	SI_OIL	35-113-32379	13709	OIL
35-113-32257	13407W	P&A_INJ	35-113-32380	13710W	SI_WINJ
35-113-32258	13108W	P&A_INJ	35-113-32381	13711	PA_PROD
35-113-32259	13408W	SI_WINJ	35-113-32382	13613	P&A_INJ
35-113-32260	13109W	P&A_INJ	35-113-32384	13501	PA_PROD
35-113-32261	13409W	SI_WINJ	35-113-32458	14102A	SI_OIL
35-113-32262	13110	PA_PROD	35-113-32459	14105	PA_PROD
35-113-32263	13410W	SI_WINJ	35-113-32461	14001	PA_PROD
35-113-32264	13111W	SI_WINJ	35-113-32462	14101	SI_OIL
35-113-32265	13112	PA_PROD	35-113-32463	1403	DRY
35-113-32266	13113W	P&A_INJ	35-113-32464	14103	PA_PROD
35-113-32267	13114	OIL	35-113-32465	14104	PA_PROD
35-113-32268	13115	PA_PROD	35-113-32467	14005W	P&A_INJ
35-113-32285	14601	PA_PROD	35-113-33494	101	PA_PROD
35-113-32286	14602	PA_PROD	35-113-33495	102	DRY
35-113-32287	14603	P&A_INJ	35-113-33496	402	SI_OIL
35-113-32288	14604	DRY	35-113-33497	103	DRY
35-113-32355	13806	SI_OIL	35-113-33498	403	PA_PROD
35-113-32356	13801W	PA_PROD	35-113-33498	403A	SI_OIL
35-113-32357	13802	PA_PROD	35-113-33499	404	OIL
35-113-32358	13803	SI_OIL	35-113-33500	405	P&A_INJ
35-113-32359	13804	SI_OIL	35-113-33501	406	PA_PROD
35-113-32360	13902W	SI_WINJ	35-113-33502	408W	P&A_INJ
35-113-32361	13807	P&A_INJ	35-113-33503	814	PA_PROD
35-113-32362	13808	SI_OIL	35-113-33504	815	P&A_INJ
35-113-32363	13809W	P&A_INJ	35-113-33506	1402	OIL
35-113-32364	13814W	SI_WINJ	35-113-33507	1403W	W_INJ
35-113-32365	13815W	P&A_INJ	35-113-33508	1404	SI_OIL
35-113-32366	13816	DRY	35-113-33509	1405W	W_INJ
35-113-32367	13810W	P&A_INJ	35-113-33510	1406	PA_PROD
35-113-32368	13811	SI_OIL	35-113-33511	1407	OIL
35-113-32369	13812W	PA_PROD	35-113-33512	1408	PA_PROD
35-113-32370	13616W	P&A_INJ	35-113-33513	1409	P&A_INJ
35-113-32371	13901	OIL	35-113-33514	1410W	P&A_INJ
35-113-32372	13701	SI_OIL	35-113-33515	1411	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33516	1412	PA_PROD	35-113-33558	1613	P&A_INJ
35-113-33517	1413	OIL	35-113-33559	1013	PA_PROD
35-113-33518	1414	OIL	35-113-33560	1614	PA_PROD
35-113-33519	1415	P&A_INJ	35-113-33561	1514	PA_PROD
35-113-33520	1416W	P&A_INJ	35-113-33562	1014	P&A_INJ
35-113-33521	901	PA_PROD	35-113-33563	1515	PA_PROD
35-113-33522	1501	OIL	35-113-33564	1615A	PA_PROD
35-113-33523	1601	OIL	35-113-33565	1015	PA_PROD
35-113-33524	1001	OIL	35-113-33566	1516	PA_PROD
35-113-33525	1502	OIL	35-113-33567	1616	P&A_INJ
35-113-33526	1602	OIL	35-113-33568	1016	PA_PROD
35-113-33527	1002	PA_PROD	35-113-33569	1517	UNKNW
35-113-33528	1503	OIL	35-113-33570	1201	OIL
35-113-33529	1603	OIL	35-113-33571	1701	OIL
35-113-33530	1003	PA_PROD	35-113-33572	1702	OIL
35-113-33531	1504	OIL	35-113-33573	1202	OIL
35-113-33532	1604	OIL	35-113-33574	1102	OIL
35-113-33533	1004	PA_PROD	35-113-33575	1703	OIL
35-113-33534	1505	PA_PROD	35-113-33576	1203	OIL
35-113-33535	1605	PA_PROD	35-113-33577	1103	SI_OIL
35-113-33536	1005	PA_PROD	35-113-33578	1104	OIL
35-113-33537	1506	P&A_INJ	35-113-33579	1704	OIL
35-113-33538	1606W	WAG	35-113-33580	1204	OIL
35-113-33539	1006	P&A_INJ	35-113-33581	1101	PA_PROD
35-113-33540	1607	P&A_INJ	35-113-33582	1705	PA_PROD
35-113-33541	1507	PA_PROD	35-113-33583	1205	P&A_INJ
35-113-33542	1007	PA_PROD	35-113-33584	1105W	WAG
35-113-33543	1508W	WAG	35-113-33585	1706	PA_PROD
35-113-33544	1608	PA_PROD	35-113-33586	1206	PA_PROD
35-113-33545	1008	P&A_INJ	35-113-33587	1106	PA_PROD
35-113-33546	1609	OIL	35-113-33588	1707	P&A_INJ
35-113-33547	1009	OIL	35-113-33589	1207W	P&A_INJ
35-113-33548	1510	P&A_INJ	35-113-33590	1107	P&A_INJ
35-113-33549	1610	OIL	35-113-33591	1208	P&A_INJ
35-113-33550	1010	OIL	35-113-33592	1708	PA_PROD
35-113-33552	1511W	P&A_INJ	35-113-33593	1108	PA_PROD
35-113-33553	1611	PA_PROD	35-113-33594	1109	OIL
35-113-33554	1011	PA_PROD	35-113-33595	1110	OIL
35-113-33555	1612	OIL	35-113-33596	1711	OIL
35-113-33556	1012	OIL	35-113-33597	1211	OIL
35-113-33557	1513	PA_PROD	35-113-33598	1111	OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33599	1112	OIL	35-113-33639	3015	P&A_INJ
35-113-33600	1212	OIL	35-113-33640	3016	P&A_INJ
35-113-33601	1213	PA_PROD	35-113-33641	3817	PA_PROD
35-113-33602	1713	PA_PROD	35-113-33642	4705	PA_PROD
35-113-33602	1713A	WAG	35-113-33643	4901	TA_OIL
35-113-33603	1113	PA_PROD	35-113-33645	4902	PA_PROD
35-113-33604	1714	PA_PROD	35-113-33646	3902	SI_OIL
35-113-33605	1214	P&A_INJ	35-113-33647	3903	TA_OIL
35-113-33606	1114	PA_PROD	35-113-33648	4903	TA_OIL
35-113-33607	1215	PA_PROD	35-113-33649	3904	PA_PROD
35-113-33608	1715W	WAG	35-113-33649	3904A	SI_OIL
35-113-33609	1115	PA_PROD	35-113-33650	4904	PA_PROD
35-113-33610	1716	PA_PROD	35-113-33650	4904A	PA_PROD
35-113-33611	1216	PA_PROD	35-113-33651	4905	P&A_UNKW
35-113-33612	1116	P&A_INJ	35-113-33652	3906	PA_PROD
35-113-33613	1117	P&A_INJ	35-113-33653	4906	P&A_UNKW
35-113-33614	18106W	UNKNW	35-113-33654	3907W	P&A_INJ
35-113-33615	2617	PA_PROD	35-113-33655	4907W	W_INJ
35-113-33616	2401	OIL	35-113-33656	4908	P&A_INJ
35-113-33617	2402	OIL	35-113-33659	3909	OIL
35-113-33618	2403	OIL	35-113-33660	4910	PA_PROD
35-113-33619	2404	OIL	35-113-33660	4910A	TA_OIL
35-113-33620	2405	PA_PROD	35-113-33661	3911	OIL
35-113-33621	2406	P&A_INJ	35-113-33662	4911	SI_OIL
35-113-33622	2407	PA_PROD	35-113-33663	4912	PA_PROD
35-113-33623	2408	P&A_INJ	35-113-33664	3912	OIL
35-113-33624	2409	OIL	35-113-33665	3913	PA_PROD
35-113-33625	2410	OIL	35-113-33666	4913	P&A_INJ
35-113-33626	2411	OIL	35-113-33667	3914	PA_PROD
35-113-33627	2412	OIL	35-113-33668	4914	PA_PROD
35-113-33628	2413	PA_PROD	35-113-33669	3915	PA_PROD
35-113-33629	2414	PA_PROD	35-113-33670	4915	PA_PROD
35-113-33630	2415	P&A_INJ	35-113-33671	3916	PA_PROD
35-113-33630	2415A	WAG	35-113-33672	4916	PA_PROD
35-113-33631	2416	P&A_INJ	35-113-33673	4801	PA_PROD
35-113-33632	3005	P&A_INJ	35-113-33674	4802	P&A_INJ
35-113-33633	3007	PA_PROD	35-113-33674	4802AW	SI_WINJ
35-113-33635	3009	PA_PROD	35-113-33675	4803W	TA_INJ
35-113-33636	3010	PA_PROD	35-113-33676	4804	PA_PROD
35-113-33637	3013	PA_PROD	35-113-33677	4805	SI_OIL
35-113-33638	3014	OIL	35-113-33678	4806W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33679	4807W	P&A_INJ	35-113-33718	5015	OIL
35-113-33680	4808A	OIL	35-113-33719	4215	P&A_INJ
35-113-33681	4809	PA_PROD	35-113-33720	5016	PA_PROD
35-113-33682	4810	TA_OIL	35-113-33721	4216	PA_PROD
35-113-33683	4811	PA_PROD	35-113-33722	4117	PA_PROD
35-113-33684	4812	PA_PROD	35-113-33723	6701	PA_PROD
35-113-33685	4813W	TA_INJ	35-113-33724	6601	P&A_INJ
35-113-33686	4814W	SI_WINJ	35-113-33725	5901	SI_OIL
35-113-33687	4815W	P&A_INJ	35-113-33726	5801W	W_INJ
35-113-33688	4816W	W_INJ	35-113-33727	5902	PA_PROD
35-113-33689	3910	OIL	35-113-33728	6702	P&A_INJ
35-113-33690	5001	SI_OIL	35-113-33729	6602	PA_PROD
35-113-33691	4201	PA_PROD	35-113-33731	5802W	SI_WINJ
35-113-33691	4201A	TA_OIL	35-113-33732	6703	OIL
35-113-33692	5002W	W_INJ	35-113-33733	5903	PA_PROD
35-113-33693	4202	PA_PROD	35-113-33734	6603W	SI_WINJ
35-113-33693	4202A	TA_OIL	35-113-33735	5803	PA_PROD
35-113-33694	5003	PA_PROD	35-113-33736	5804	PA_PROD
35-113-33695	4203	TA_OIL	35-113-33737	6704	SI_OIL
35-113-33696	5004	SI_OIL	35-113-33738	5904	PA_PROD
35-113-33697	4204	PA_PROD	35-113-33739	6604	PA_PROD
35-113-33698	4205	PA_PROD	35-113-33740	6705	PA_PROD
35-113-33699	5005	PA_PROD	35-113-33741	6705A	PA_PROD
35-113-33700	5006	TA_OIL	35-113-33742	6605	PA_PROD
35-113-33701	4206	P&A_INJ	35-113-33743	5905	PA_PROD
35-113-33702	5007	PA_PROD	35-113-33744	5805	PA_PROD
35-113-33703	4207	PA_PROD	35-113-33745	6706	PA_PROD
35-113-33704	5028W	SI_WINJ	35-113-33746	6606	SI_OIL
35-113-33705	4208	PA_PROD	35-113-33747	5906	PA_PROD
35-113-33706	5009	OIL	35-113-33748	5806	SI_OIL
35-113-33707	4209	PA_PROD	35-113-33749	6707	OIL
35-113-33708	5010	PA_PROD	35-113-33750	5907	P&A_INJ
35-113-33709	4210	SI_OIL	35-113-33751	6607	SI_OIL
35-113-33710	5011W	SI_WINJ	35-113-33752	5807	SI_OIL
35-113-33711	4211	PA_PROD	35-113-33753	5808	P&A_INJ
35-113-33712	5012	TA_OIL	35-113-33754	5908	SI_OIL
35-113-33713	4212	PA_PROD	35-113-33755	6608	SI_OIL
35-113-33714	5013	PA_PROD	35-113-33756	6709	PA_PROD
35-113-33715	4213	PA_PROD	35-113-33757	6609W	P&A_INJ
35-113-33716	5014	P&A_INJ	35-113-33758	5909	PA_PROD
35-113-33717	4214	PA_PROD	35-113-33759	5809	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33760	6710	SI_OIL	35-113-33800	5713	PA_PROD
35-113-33761	6610	PA_PROD	35-113-33801	5714	P&A_INJ
35-113-33762	5910	SI_OIL	35-113-33802	5703	OIL
35-113-33763	5810	PA_PROD	35-113-33803	6510	PA_PROD
35-113-33764	5811	SI_OIL	35-113-33804	6512	SI_OIL
35-113-33765	6711	PA_PROD	35-113-33805	5712	SI_OIL
35-113-33766	5911	SI_OIL	35-113-33806	6513W	W_INJ
35-113-33767	6712	PA_PROD	35-113-33807	5715	PA_PROD
35-113-33768	5912	PA_PROD	35-113-33808	6401	P&A_INJ
35-113-33769	5812	SI_OIL	35-113-33809	6402	SI_OIL
35-113-33770	5913	PA_PROD	35-113-33810	6403	PA_PROD
35-113-33771	6713	PA_PROD	35-113-33811	6404	P&A_INJ
35-113-33772	5813	PA_PROD	35-113-33812	6405W	P&A_INJ
35-113-33773	6714	P&A_INJ	35-113-33813	6406	PA_PROD
35-113-33774	5914	PA_PROD	35-113-33814	5601	PA_PROD
35-113-33775	5814W	W_INJ	35-113-33815	5602W	P&A_INJ
35-113-33776	5915	P&A_INJ	35-113-33816	5603	PA_PROD
35-113-33777	6715	PA_PROD	35-113-33817	5604	PA_PROD
35-113-33778	5815	SI_OIL	35-113-33818	5605W	SI_WINJ
35-113-33779	6716	PA_PROD	35-113-33819	5606	PA_PROD
35-113-33780	5916	PA_PROD	35-113-33820	5607	SI_OIL
35-113-33781	5816	DRY	35-113-33821	5608	OIL
35-113-33782	6501	SI_WINJ	35-113-33822	5609	OIL
35-113-33783	5701	SI_OIL	35-113-33823	5610W	P&A_INJ
35-113-33784	6502	PA_PROD	35-113-33824	5611	SI_SWD
35-113-33785	5702	OIL	35-113-33828	7401	SI_OIL
35-113-33786	6503	PA_PROD	35-113-33829	7402	SI_OIL
35-113-33786	6503A	PA_PROD	35-113-33830	7403	SI_OIL
35-113-33787	6504	PA_PROD	35-113-33831	7404	PA_PROD
35-113-33788	5704	SI_OIL	35-113-33832	7405	P&A_INJ
35-113-33789	6505	SI_OIL	35-113-33833	7406	SI_OIL
35-113-33790	5705	PA_PROD	35-113-33834	7407	PA_PROD
35-113-33791	6506	SI_OIL	35-113-33835	7408	SI_OIL
35-113-33792	5706	PA_PROD	35-113-33836	7410	PA_PROD
35-113-33793	5707	PA_PROD	35-113-33837	7411	PA_PROD
35-113-33794	6508	SI_OIL	35-113-33838	7412	PA_PROD
35-113-33795	5708	PA_PROD	35-113-33839	7301	PA_PROD
35-113-33796	6509	SI_OIL	35-113-33840	7302A	SI_OIL
35-113-33797	5709	SI_OIL	35-113-33841	7303	PA_PROD
35-113-33798	5710	PA_PROD	35-113-33842	7304	PA_PROD
35-113-33799	6511	OIL	35-113-33843	8201	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33844	8309	SI_OIL	35-113-33896	2904	PA_PROD
35-113-33845	8312	SI_OIL	35-113-33897	2911	PA_PROD
35-113-33846	8313	PA_PROD	35-113-33898	2912	PA_PROD
35-113-33848	8401	PA_PROD	35-113-33899	3701	PA_PROD
35-113-33849	8402	PA_PROD	35-113-33900	3702	SI_OIL
35-113-33850	8503	SI_OIL	35-113-33902	3601	PA_PROD
35-113-33851	8414	PA_PROD	35-113-33903	3602	PA_PROD
35-113-33856	8409	PA_PROD	35-113-33904	3603	PA_PROD
35-113-33857	8410	PA_PROD	35-113-33905	3604	PA_PROD
35-113-33858	8411	PA_PROD	35-113-33906	3605	SI_OIL
35-113-33859	8412	P&A_INJ	35-113-33907	3606	SI_OIL
35-113-33860	8413	PA_PROD	35-113-33908	3607	PA_PROD
35-113-33861	8414	PA_PROD	35-113-33909	3608	PA_PROD
35-113-33862	8415	PA_PROD	35-113-33910	3609	P&A_INJ
35-113-33863	8416	PA_PROD	35-113-33912	3611	SI_OIL
35-113-33864	8417	PA_PROD	35-113-33913	3612	PA_PROD
35-113-33865	7506	PA_PROD	35-113-33914	3613	PA_PROD
35-113-33866	7616W	SI_WINJ	35-113-33915	3614	PA_PROD
35-113-33867	7501W	P&A_INJ	35-113-33916	2707	PA_PROD
35-113-33868	7502W	W_INJ	35-113-33917	2713	PA_PROD
35-113-33869	7503W	P&A_INJ	35-113-33918	2714	TA_OIL
35-113-33870	7513W	W_INJ	35-113-33919	2715	PA_PROD
35-113-33871	7601W	W_INJ	35-113-33920	2716	PA_PROD
35-113-33872	7602W	P&A_INJ	35-113-33921	2802	PA_PROD
35-113-33873	7603W	P&A_INJ	35-113-33922	2803	PA_PROD
35-113-33874	7604	SI_OIL	35-113-33923	2804	PA_PROD
35-113-33875	7604W	W_INJ	35-113-33924	2805	PA_PROD
35-113-33876	8401W	SI_WINJ	35-113-33925	2806W	P&A_INJ
35-113-33877	8402W	P&A_INJ	35-113-33926	2807	PA_PROD
35-113-33878	8403W	W_INJ	35-113-33927	2808	PA_PROD
35-113-33886	2901	PA_PROD	35-113-33928	2809	PA_PROD
35-113-33887	2902	PA_PROD	35-113-33930	2811	PA_PROD
35-113-33888	2903	PA_PROD	35-113-33931	2812	PA_PROD
35-113-33889	2905	PA_PROD	35-113-33932	2813	PA_PROD
35-113-33890	2906	SI_OIL	35-113-33933	2814	PA_PROD
35-113-33891	2907	PA_PROD	35-113-33934	2815	PA_PROD
35-113-33892	2908	PA_PROD	35-113-33935	2816	PA_PROD
35-113-33893	2909	P&A_INJ	35-113-33936	5201	OIL
35-113-33894	2910	PA_PROD	35-113-33937	5202	OIL
35-113-33895	2913	PA_PROD	35-113-33938	5203	P&A_INJ
35-113-33895	2913A	PA_PROD	35-113-33939	5204	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33941	5206	PA_PROD	35-113-34015	6004	PA_PROD
35-113-33942	5207	PA_PROD	35-113-34016	6005	SI_OIL
35-113-33943	5209	OIL	35-113-34017	6006	PA_PROD
35-113-33944	5212	PA_PROD	35-113-34018	6007	PA_PROD
35-113-33945	5213A	DRY	35-113-34019	6008	PA_PROD
35-113-33946	5213	DRY	35-113-34020	6009	PA_PROD
35-113-33947	5214	PA_PROD	35-113-34021	6010	PA_PROD
35-113-33948	5215	PA_PROD	35-113-34022	6011	PA_PROD
35-113-33949	5216	P&A_INJ	35-113-34023	6012	PA_PROD
35-113-33950	5208	PA_PROD	35-113-34024	6013	PA_PROD
35-113-33951	5210	P&A_INJ	35-113-34025	6014	PA_PROD
35-113-33952	5211	OIL	35-113-34026	6015	P&A_INJ
35-113-33953	4416	PA_PROD	35-113-34027	6016	PA_PROD
35-113-33954	5501	PA_PROD	35-113-34028	6017	PA_PROD
35-113-33955	5502	PA_PROD	35-113-34029	7701W	P&A_INJ
35-113-33956	5503	PA_PROD	35-113-34030	7702W	W_INJ
35-113-33957	4502	PA_PROD	35-113-34031	7703W	P&A_INJ
35-113-33958	4503	PA_PROD	35-113-34032	7704W	W_INJ
35-113-33959	5504	PA_PROD	35-113-34033	7705W	W_INJ
35-113-33960	4504	PA_PROD	35-113-34034	7708W	P&A_INJ
35-113-33961	5505	PA_PROD	35-113-34035	7801W	W_INJ
35-113-33962	4505	PA_PROD	35-113-34036	7802W	P&A_INJ
35-113-33963	546	PA_PROD	35-113-34037	7803W	P&A_INJ
35-113-33964	4506	PA_PROD	35-113-34038	7804W	P&A_INJ
35-113-33965	5507	PA_PROD	35-113-34039	7805W	SI_WINJ
35-113-33966	4507	SI_OIL	35-113-34040	7806W	P&A_INJ
35-113-33968	5408	PA_PROD	35-113-34042	7808W	P&A_INJ
35-113-33999	6301	PA_PROD	35-113-34043	8601W	P&A_INJ
35-113-34000	6302	PA_PROD	35-113-34044	8603W	P&A_INJ
35-113-34001	6303	PA_PROD	35-113-34045	8604W	P&A_INJ
35-113-34002	6304	PA_PROD	35-113-34046	8701W	W_INJ
35-113-34003	6305	PA_PROD	35-113-34047	8702W	P&A_INJ
35-113-34004	6306	PA_PROD	35-113-34048	8703W	W_INJ
35-113-34005	6307	P&A_INJ	35-113-34049	8704W	P&A_INJ
35-113-34007	6309	PA_PROD	35-113-34050	8705W	P&A_INJ
35-113-34008	6310	PA_PROD	35-113-34051	8706W	W_INJ
35-113-34009	6311	PA_PROD	35-113-34052	8707W	P&A_INJ
35-113-34010	6312	PA_PROD	35-113-34053	8708W	W_INJ
35-113-34011	6313	P&A_INJ	35-113-34054	7901W	P&A_INJ
35-113-34012	6001A	PA_PROD	35-113-34055	7902W	SI_WINJ
35-113-34014	6003	PA_PROD	35-113-34056	7903W	W_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-34057	7907W	SI_WINJ	35-113-36899	4601	PA_PROD
35-113-34058	8001W	SI_WINJ	35-113-36901	6002	PA_PROD
35-113-34059	8002W	SI_WINJ	35-113-36902	5205	PA_PROD
35-113-34060	8003W	P&A_INJ	35-113-36903	9906	PA_PROD
35-113-34061	8004W	P&A_INJ	35-113-36904	12210	PA_PROD
35-113-34062	8005W	SI_WINJ	35-113-36906	8001	PA_PROD
35-113-34063	8006W	P&A_INJ	35-113-36907	8002	PA_PROD
35-113-34064	8007AW	SI_WINJ	35-113-36964	7807W	P&A_INJ
35-113-34065	8008W	SI_WINJ	35-113-36965	7708A	PA_PROD
35-113-34066	8801W	P&A_INJ	35-113-37061	6701W	W_INJ
35-113-34067	8802W	P&A_INJ	35-113-37070	4525W	P&A_INJ
35-113-34068	8803W	SI_WINJ	35-113-37072	612	PA_PROD
35-113-34069	8804W	P&A_INJ	35-113-37072	612A	OIL
35-113-34070	8805W	SI_WINJ	35-113-37073	306	SI_OIL
35-113-34071	8806W	SI_WINJ	35-113-37075	1628W	P&A_INJ
35-113-34072	8901W	P&A_INJ	35-113-37080	2504A	OIL
35-113-34073	8902W	SI_WINJ	35-113-37082	6408	SI_OIL
35-113-34074	6001	SI_OIL	35-113-37083	2516	SI_OIL
35-113-34075	8903W	SI_WINJ	35-113-37083	2516A	OIL
35-113-34076	8904W	SI_WINJ	35-113-37102	12512	PA_PROD
35-113-34077	8908W	SI_WINJ	35-113-37105	9602W	P&A_INJ
35-113-34078	8817	DRY	35-113-37107	10910	SI_OIL
35-113-34079	7917	PA_PROD	35-113-37108	10914	PA_PROD
35-113-34080	14306	SI_OIL	35-113-37111	1824W	P&A_INJ
35-113-34081	8101W	P&A_INJ	35-113-37112	1228W	W_INJ
35-113-34082	8102W	P&A_INJ	35-113-37115	8302W	P&A_INJ
35-113-34083	8103W	P&A_INJ	35-113-37116	8322	UNKNW
35-113-34084	8105W	P&A_INJ	35-113-37117	8303	P&A_INJ
35-113-34085	9001W	P&A_INJ	35-113-37118	7304W	SI_WINJ
35-113-34086	9002W	P&A_INJ	35-113-37119	7405W	P&A_INJ
35-113-34087	9003W	P&A_INJ	35-113-37120	7406W	P&A_INJ
35-113-34088	9005W	P&A_INJ	35-113-37121	7407W	P&A_INJ
35-113-34089	8113	PA_PROD	35-113-37136	7505W	P&A_INJ
35-113-34090	8114	PA_PROD	35-113-37137	7605W	P&A_INJ
35-113-34091	8116	PA_PROD	35-113-37138	7506W	P&A_INJ
35-113-36813	9106	PA_PROD	35-113-37139	7507W	P&A_INJ
35-113-36894	10113	PA_PROD	35-113-37140	7608W	P&A_INJ
35-113-36894	10113A	SI_OIL	35-113-37142	7514	SI_OIL
35-113-36895	13805	SI_OIL	35-113-37151	2023W	P&A_INJ
35-113-36895	13805W	P&A_INJ	35-113-37152	12922	SI_OIL
35-113-36897	5309	PA_PROD	35-113-37172	339	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-37172	2509	OIL	35-113-41951	3329W	WAG
35-113-37172	3309	SI_OIL	35-113-41952	2629D	SI_SWD
35-113-37779	8W	P&A_INJ	35-113-41975	4429D	SWD
35-113-37780	12416AW	P&A_INJ	35-113-42088	5724W	W_INJ
35-113-37781	12901	P&A_INJ	35-113-42089	5725	OIL
35-113-37782	13116	PA_PROD	35-113-42090	5726	SI_OIL
35-113-37783	13004	PA_PROD	35-113-42091	5727	OIL
35-113-37784	13110A	SI_OIL	35-113-42092	3928	OIL
35-113-37785	13012W	SI_OIL	35-113-42093	4828	SI_WINJ
35-113-37851	501	OIL	35-113-42095	4928W	W_INJ
35-113-37852	1709	OIL	35-113-42096	3929	SI_WINJ
35-113-37853	1710	OIL	35-113-42097	4929	SI_OIL
35-113-37854	1712	PA_PROD	35-113-42098	4930	OIL
35-113-37856	2515	PA_PROD	35-113-42100	4932W	SI_WINJ
35-113-37858	8703	PA_PROD	35-113-42101	4933W	W_INJ
35-113-37867	504	OIL	35-113-42126	5129W	SI_WINJ
35-113-37874	511	PA_PROD	35-113-42139	4829	SI_OIL
35-113-37874	511A	OIL	35-113-42139	4929C	P&A_UNKW
35-113-37887	8409	PA_PROD	35-113-42142	13818W	P&A_INJ
35-113-37889	13106W	P&A_INJ	35-113-42357	5710A	SI_OIL
35-113-37904	10102W	P&A_INJ	35-113-42368	14008W	SI_WINJ
35-113-37905	9416W	P&A_INJ	35-113-43099	4931	SI_OIL
35-113-37906	3328W	WAG	35-113-43565	509	OIL
35-113-37907	7905W	W_INJ	35-113-43596	510	OIL
35-113-37965	1424W	WAG	35-113-43597	512	OIL
35-113-37986	8501	PA_PROD	35-113-43598	802	OIL
35-113-37987	7402W	SI_WINJ	35-113-43599	3201	OIL
35-113-37988	7401W	P&A_INJ	35-113-43601	5232W	W_INJ
35-113-38019	506W	WAG	35-113-43603	6612	OIL
35-113-41342	11127	OIL	35-113-43604	8605	SI_OIL
35-113-41908	5231D	SI_SWD	35-113-43605	6112	SI_OIL
35-113-41909	4228W	SI_WINJ	35-113-43606	9719	SI_OIL
35-113-41910	5128W	W_INJ	35-113-43607	9726W	W_INJ
35-113-41944	5133W	W_INJ	35-113-43608	9727W	SI_WINJ
35-113-41945	5031D	SI_SWD	35-113-43609	9737W	SI_WINJ
35-113-41946	5029W	SI_WINJ	35-113-43610	13107	OIL
35-113-41947	4230AW	SI_WINJ	35-113-43611	14004	SI_OIL
35-113-41947	4230W	P&A_INJ	35-113-43612	1901	PA_PROD
35-113-41948	4229W	W_INJ	35-113-43612	1901A	SI_OIL
35-113-41949	3428W	W_INJ	35-113-43613	1902	SI_OIL
35-113-41950	3430WS	SI_WSW	35-113-43614	1910	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-43615	1512	OIL	35-113-45252	452W	WAG
35-113-43616	12607	OIL	35-113-45291	852W	W_INJ
35-113-43617	12714	SI_OIL	35-113-45292	2255	W_INJ
35-113-43875	1441W	W_INJ	35-113-45293	3357W	WAG
35-113-43877	3141W	WAG	35-113-45294	1855W	WAG
35-113-43878	4041W	WAG	35-113-45315	1257W	W_INJ
35-113-43879	3941W	WAG	35-113-45316	1748	OIL
35-113-43892	2341W	WAG	35-113-45317	1853W	WAG
35-113-43893	2441W	WAG	35-113-45318	1857W	WAG
35-113-43894	3142W	WAG	35-113-45319	3052W	W_INJ
35-113-43904	2241W	W_INJ	35-113-45321	3457W	W_INJ
35-113-43924	4042W	WAG	35-113-45322	741	OIL
35-113-43963	1741W	WAG	35-113-45332	2657W	WAG
35-113-44124	1541	OIL	35-113-45367	742	OIL
35-113-44125	1542	OIL	35-113-45369	3448	TA_OIL
35-113-44126	2442W	WAG	35-113-45390	3453W	W_INJ
35-113-44213	3942W	W_INJ		3513AW	WAG_TBD
35-113-44214	4043W	W_INJ		3513AW	WAG_TBD
35-113-44320	3241W	WAG		3602AW	WAG_TBD
35-113-44465	2541W	WAG		5002AW	WAG_TBD
35-113-44466	3341W	WAG		5225AW	WAG_TBD
35-113-44467	3841W	W_INJ		5306AW	WAG_TBD
35-113-44468	2242W	W_INJ		5308AW	WAG_TBD
35-113-44616	3242	OIL		5313AW	WAG_TBD
35-113-44617	3143W	WAG		5402AW	WAG_TBD
35-113-44670	2342	OIL		5407AW	WAG_TBD
35-113-44697	2343	OIL		5707AW	WAG_TBD
35-113-44864	541W	WAG		5715AW	WAG_TBD
35-113-44866	642W	WAG		5727AW	WAG_TBD
35-113-44874	1044	OIL		5801AW	WAG_TBD
35-113-44878	1641	OIL		5803AW	WAG_TBD
35-113-44885	942	OIL		5813AW	WAG_TBD
35-113-44889	941	OIL		5903AW	WAG_TBD
35-113-44918	2344	OIL		5912AW	WAG_TBD
35-113-44926	842W	W_INJ		5914AW	WAG_TBD
35-113-44927	1042	OIL		5927AW	WAG_TBD
35-113-44928	1041	OIL		6021AW	WAG_TBD
35-113-44931	943	OIL		6025AW	WAG_TBD
35-113-44932	2542W	WAG		6125AW	WAG_TBD
35-113-44933	1141WR	WAG		6205AW	WAG_TBD
35-113-44936	1742W	WAG		6207AW	WAG_TBD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
	6209AW	WAG_TBD		6213AW	WAG_TBD

Appendix B: Submissions and Responses to Requests for Additional Information

North Burbank Unit (NBU)
CO_2 Monitoring, Reporting, and Verification (MRV) Plan

Perdure Petroleum

September 18, 2020

Table of Contents

Introduction

Perdure Petroleum LLC (Perdure) operates the North Burbank Unit (NBU) located near Shidler, Oklahoma for the primary purpose of enhanced oil recovery (EOR) using carbon dioxide (CO_2) with a subsidiary or ancillary purpose of geologic sequestration of CO_2 in a subsurface geologic formation. Perdure has been operating the NBU since 2017. Perdure acquired the NBU from Chaparral Energy LLC, which initiated the CO_2-EOR project in 2013. Perdure intends to continue CO_2-EOR operations until the end of the economic life of the CO_2-EOR program.

Perdure has developed this monitoring, reporting and verification (MRV) plan in accordance with the rules and regulations in Subpart RR of the Mandatory Greenhouse Gas Reporting Program, 40 CFR Sections 98.440-98.449,[1] to provide for the monitoring, reporting and verification of geologic sequestration in the Burbank reservoir during the injection period in the geographic area defined as the unit boundary of the NBU. This MRV Plan meets the requirements of Section 98.440(c)(1).

This MRV Plan contains the following 12 sections:

- Section 1 contains facility information.
- Section 2 contains the project description. This section estimates the years of CO_2 injection, provides the estimated tons of CO_2 to be injected and stored at the NBU, describes the geology of the NBU, details the operational history of the NBU, and provides an overview of the injection program and project facilities. This section also demonstrates the suitability for secure geologic storage in the reservoir.
- Section 3 contains the delineation of the monitoring areas.
- Section 4 evaluates the potential leakage pathways and demonstrates that the risk of CO_2 leakage through the identified pathways is minimal.
- Section 5 provides information on the detection, verification and quantification of leakage. Leakage detection incorporates several monitoring programs, each of which are described. Detection efforts will be focused towards managing potential leaks through the injection wells and surface equipment due to the improbability of leaks through the seal or faults and fractures.
- Section 6 describes the determination of expected baselines to identify excursions from expected performance that could indicate CO_2 leakage.
- Section 7 provides the mass balance equations and the methodology for calculating volumes of CO_2 stored or sequestered.
- Section 8 provides the estimated schedule for implementation of the MRV Plan.
- Section 9 describes the quality assurance program.

[1] Any "Subpart" referenced in this Plan is a subpart of 40 CFR Part 98, and any reference in this Plan to a "Section 98.xxx" refers to that section in 40 CFR Part 98.

- Section 10 describes some methods for revising this MRV Plan.
- Section 11 describes the records retention process.
- Section 12 includes several Appendices.

In addition to complying with the rules and regulations in Subpart RR for the monitoring, reporting and verification of geologic sequestration in the reservoir during the injection period in the geographic area defined as the NBU, the rules and regulations in Subpart W will inform the activities described in this MRV Plan as explained in more detail in Section 5.5 below.

1. Facility Information

1.1. Reporter Number

The North Burbank Unit facility reports under Greenhouse Gas Reporting Program Identification number 553337. The facility is located at or near 36.82491, -96.73257, Webb City, Oklahoma.

1.2. UIC permit class: Class II

The NBU is located in Osage County, Oklahoma. While the Oklahoma Corporation Commission regulates oil and gas activities in 76 of the 77 counties in Oklahoma, the UIC program for Osage County, Oklahoma is different. For purposes of the Environmental Protection Agency (EPA) Underground Injection Control (UIC) program, UIC Class II wells for the Osage Mineral Estate are permitted pursuant to 40 CFR Part 147 Subpart GGG Sections 147.2901-147.2929.[2] As a result of these regulations, UIC Class II permits in the Osage Mineral Estate are regulated by the Osage UIC office, as well as the EPA Region 6 Administrator. All of the injection wells in the NBU are classified as UIC Class II wells under these regulations.

1.3. UIC injection well identification numbers

Wells in the NBU are identified by name and API number. The API numbers for the injection wells in the NBU, as of January 1, 2020, are listed in Section 12.7. Any new wells in the NBU will be indicated in the annual report.

2. Project Description

Perdure exclusively operates all wells within the North Burbank Unit (NBU), which produces oil (and sometimes gas) from the geologic reservoir. Numerous aspects of the geology, facilities, equipment, and operational procedures are similar throughout the NBU. Because of these similarities, one MRV Plan is being prepared for the entire NBU. This section describes the geologic setting and characteristics of the NBU, the estimated years of CO_2 injection, the tons of CO_2 to be injected and stored at the NBU, and the injection process and CO_2-EOR project facilities.

[2] All of the mineral estate in the 1.47 million-acre Osage County, including the oil, gas and other subsurface minerals in Osage County, is known as the Osage Mineral Estate. According to the Osage Allotment Act of June 28, 1906, the United States holds title to the Osage Mineral Estate in trust for the Osage Nation, which is the beneficial owner of the Osage Mineral Estate.

2.1. Estimated years of CO_2 injection

A long-term performance forecast for the NBU has been conducted using the reservoir modeling approaches described in Section 4.1 below. In general, that forecast includes the estimated years of CO_2 injection and the estimated amounts of CO_2 anticipated to be injected and stored in the NBU as a result of current and planned CO_2-EOR operations during the modeling period, based on historic and predicted data. The forecast is based on results from a reservoir model that is used to develop injection plans for each injection pattern. This forecast is merely that: a forecast or prediction; actual data will be collected, assessed and reported as described in other portions of this MRV Plan to demonstrate the tons of CO_2 injected and stored at the NBU. The receipt and injection of CO_2 into the NBU commenced in 2013 and has continued since that time. The forecast anticipates that CO_2 will continue to be received at the NBU until at least 2060.

Figure 1 is a visual representation of a portion of the long-term performance forecast. Figure 1 reflects the actual (historic) amount of CO_2 injection and stored volumes in the NBU for the period beginning in 2013 when CO_2-EOR flooding was commenced in the NBU through 2019, as well as the projected tons to be injected and stored through 2040.

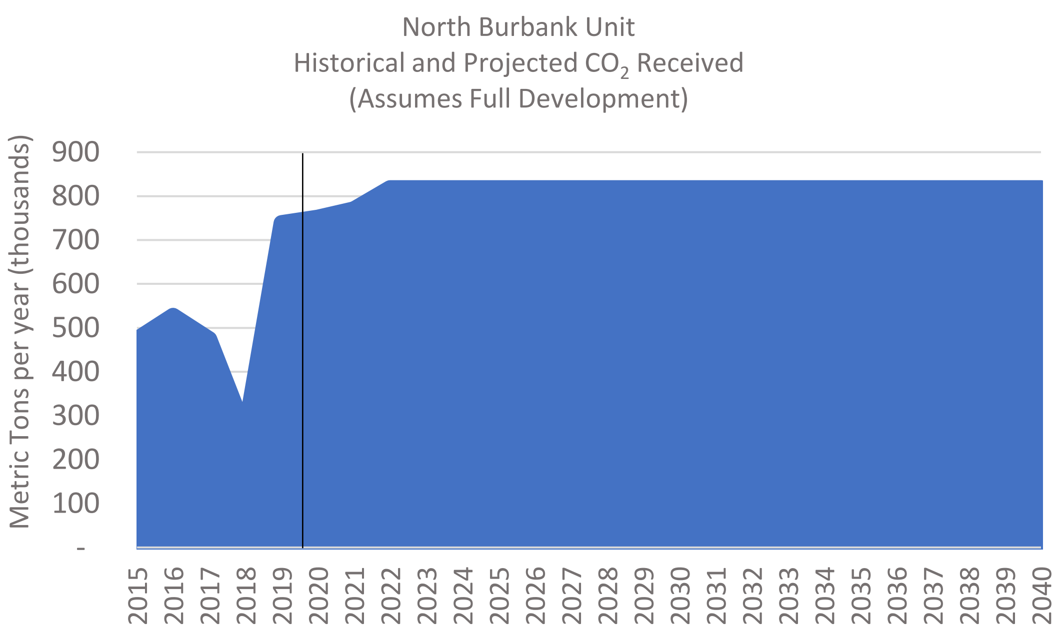

Figure 1 –Historic and Forecast CO_2 Injection and Storage at the NBU

2.2. Estimated tons of CO_2 injected and stored

The amount of CO_2 injected at the NBU is adjusted periodically to maintain reservoir pressure and to increase recovery of oil by extending or expanding the EOR project. The amount of CO_2 injected is the amount needed to balance the fluids removed from the reservoir and to increase oil recovery. While the model output shows CO_2 injection and storage through 2060, this data is for planning purposes only and may not necessarily represent the actual operational life of the NBU EOR project. As of the end of 2019, 143.8 BCF (7.58 million metric tons (MMT)) of CO_2 has been injected into the NBU. Of that amount, 77.6 BCF (4.09 MMT) was produced and recycled.

While tons of CO_2 injected and stored will be calculated using the mass balance equations described in Section 7, the forecast described above reflects that the total amount of CO_2 injected and stored over the modeled injection period to be 514 BCF (27.11 MMT). This represents approximately 46.7% of the theoretical storage capacity of the NBU.

2.3. Geologic Setting

The project site for this MRV Plan is the North Burbank Field, located in Osage County, Oklahoma. See Figure 2 for a general location of Osage County, Oklahoma.

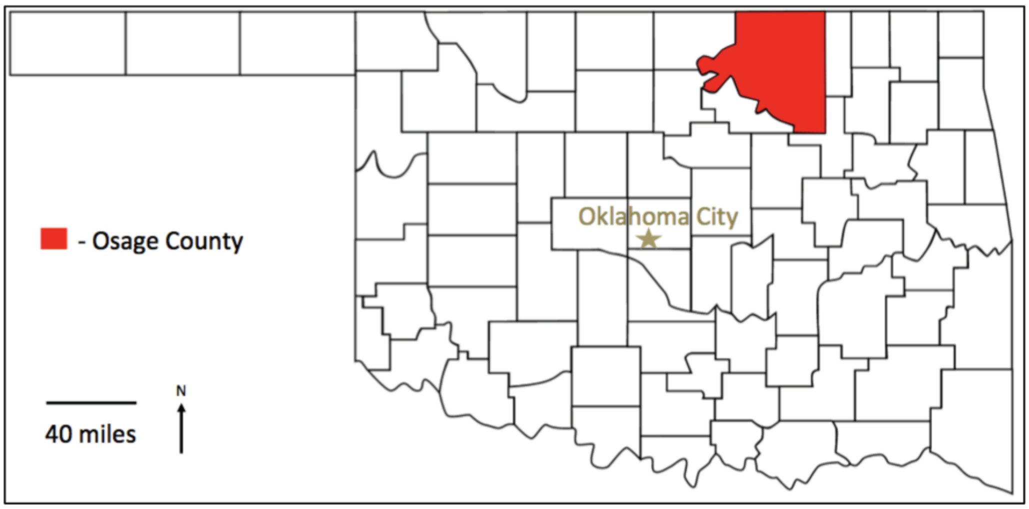

Figure 2 – General Location of Project[3]

The North Burbank Field is a sandstone reservoir that is a large oil trap. The oil producing zone is a large sand body comprised of many overlapping sand bars deposited along the southern shore of the Cherokee sea of Pennsylvania Age. The oil trap is an updip pinch-out of multistoried sands deposited into channels, eroded into underlying marine shales. The overlapping and erosional contact between these channels produced a net effect of a wide, single sand body. Intermittent marine incursions spread the reservoir in an east-west direction, further widening the sand body. The channels have a north-south trend. The reservoir is a well-consolidated sand and is rather strongly oil-wet. It is a Fluvial dominated deltaic (Class 1) reservoir. The reservoir is heterogeneous horizontally and vertically.[4] The Cherokee platform is a province with a relatively stable geologic history.[5]

The Burbank Sandstone includes the Red Fork and Bartlesville formations. "The Bartlesville and Burbank sands are so similar in composition and physical characteristics that they cannot be differentiated with certainty."[6] For convenience, this MRV Plan will refer to the Burbank Sandstone, the Red Fork formation and the Bartlesville formation collectively as the "reservoir". At the Burbank Field, the reservoir is about 3,000 feet below the surface, located in Ranges 5E-6E and Townships 26N-27N in Osage County, Oklahoma. The Burbank Field is 12 miles long, 4.5 miles wide, and trends in a southeast-northwest

[3] West (2015).
[4] Lorenz (1986).
[5] West (2015); Kleinschmidt (1976).
[6] Leatherock (1937).

direction. The sand is largely composed of fine- and medium-grained quartz cemented with silica, dolomite, ankerite and calcite.

The Burbank Field was discovered in 1920. The Burbank Field is located in western Osage County, in north-central Oklahoma (see Figure 3). The Burbank Field is approximately 25 miles east of Ponca City, Oklahoma, and 60 miles northwest of Tulsa, Oklahoma, as indicated by the red dot in Figure 3.

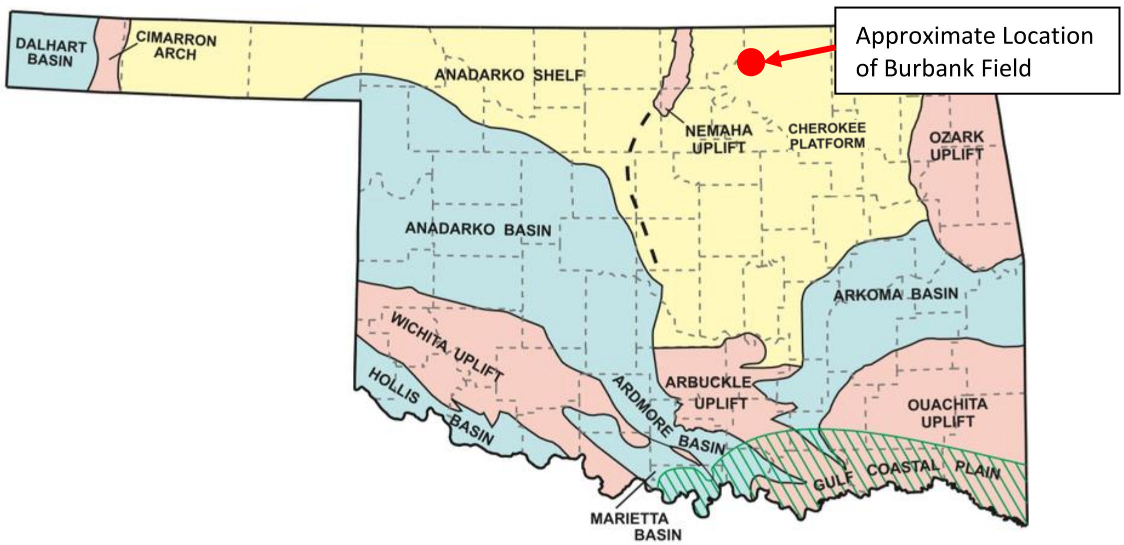

Figure 3 – Paleogeographic Map of Oklahoma[7]

As shown in Figure 3, Osage County, and the NBU, is bound to the east by the Ozark Uplift, and to the west by the Nemaha Uplift. In Osage County, regional dip of the strata is to the west-southwest.[8]

The Burbank Field is one of the largest oil fields in the United States and has approximately 824 million barrels of Original Oil In Place (OOIP). Since first discovered in the 1920s, the Burbank Field has produced approximately 360 million barrels of oil, or 39% of the OOIP. The reservoir has been buried underneath thick layers of impermeable rock. Over time, subsurface elevations within the reservoir have become uneven, creating variations in elevations and relatively higher subsurface elevations in locations such as the Burbank Field where oil and natural gas have accumulated.

The reservoir (highlighted in green in Figure 4 on page 6) now lies beneath approximately 3,000 feet of overlying sediments. There are numerous formations above the reservoir that are impermeable and serve as reliable barriers to prevent fluids from moving upwards towards the surface. These barriers, or "seals", effectively seal fluids into the formation(s) beneath them. In the Burbank Field, the first seal is the Pink Limestone member of the Cabaniss formation in the Cherokee Group. Above this lie over 10 additional intervals of impermeable rock layers of various thicknesses, including the Verdigris Lime, the "Big Lime" and the Avant/Iola Lime formations or members. These formations and members are highlighted in brown in Figure 4 (on page 6).

[7] Villalba (2016).
[8] West (2015).

Depth	System	Series	Group	Formation	Member
	Quaternary	Quaternary	Alluvium & Terrace		
	Permian	Leonardian	Sumner	Wellington	
		Wolfcampian	Chase	Oscar	
			Council Grove	Vanoss	Red Eagle Lime
50’				Sand Creek	Foraker Lime
			Admire Group		Admire Shale
~200’	Pennsylvanian	Virgilian	Wabaunsee	Ada	Campbell, Ragan, Crews and Ebert Sands
				Pawhuska	Burlingame Lime
					Newkirk Sand
~725’			Shawnee	Elgin	Pawhuska (Deer Creek) Lime
~900’					Hoover, Elgin, and Carmichael Sands
~1000’				Nelagoney (Vamoosa)	Oread Lime
~1150’					Endicott & Lovell Sands
			Douglas		Haskell Lime
~1400’					Fourmile, Cheshewalla, Revard, Bigheart and Tonkawa Sands
		Missourian	Ochelata		Wildhorse Lime
`1700’				Barnsdall	Okesa Sand (Suitcase Sands)
					Lane-Vilas Shale
				Torpedo	Torpedo Sand
				Wann	Clem Creek (Perry Gas) Sand
~1875’				Iola	Avant/Iola Lime
					Muncie Creek Shale
					Paola (Loula) Lime
~1950’				Chanute	Osage Layton (Cottage Grove) Sand
			Skiatook	Dewey Lime	Dewey/Drum Limestone
				Nellie Bly	Cherry Vale Shale
					Layton (Shell Creek), Mussellem and
					Hogshooter (Dennis) Limestone
~2250’				Coffeyville	True Layton (Dodd Creek) Sand
~2400’					Checkerboard Lime
~2450’				Seminole	Cleveland Sands
		Desmoinesian	Marmaton	Holdenville	
					Memorial Shale
				Lenapah	Lenapah Lime
				Nowata	Nowata Shale
					Altamont Lime
					Bandera Shale
~2490’				Oologah	Big Lime (Pawnee Lime)
~2575’				Labette	Labette (Cherokee) Shale
~2625’				Fort Scott Lime	Oswego Lime
			Cherokee	Cabaniss (Senora, Boggy Savanna)	Little Osage, Excello and Oakley Shales
~2750’					Prue (Squirrel) Shale and Sand
					Verdigris Lime
~2865’					Skinner and Sonner Sands
~2890’					Pink or “Hot Pink” Lime
~3000’				Krebs	Burbank (Red Fork and Bartlesville) Sands
					Brown Lime
					Penn Shales
~3030’	Mississippian	Osagean	Boone Group		Boone Lime
		Kinderhookian	St. Joe Lime		St. Joe Lime
~3300’	Devonian		Chattanooga (Woodford) Shale		Misener Sand
	Ordovician		Sylvan Group		Sylvan (Maquoketa) Shale
			Viola Group		Viola (Fite) Lime
			Simpson Group		Wilcox Sand
					Tyner Shales and Sands
					Burgen Sand
~3525’	Cambrian		Arbuckle Group		
~3800’			Siliceous Lime		
~3850’			Reagan Sand (Timbered Hills) & Granite Wash		
~4400’	Pre-Cambrian		Spavinaw Granite & Washington County / Rhyolite		

Figure 4 – Generalized Stratigraphic Column for Osage County, Oklahoma (compiled from Keeling (2016); Suneson (2010); West (2015); Jennings (2014); Li (2014); Reeves (1999); Stafford (2014); and Bass (1942)

The Burbank Field includes formations that involve incised valley fill sequences. The geologic depositional model of the Burbank Field is depicted in Figure 5 below.

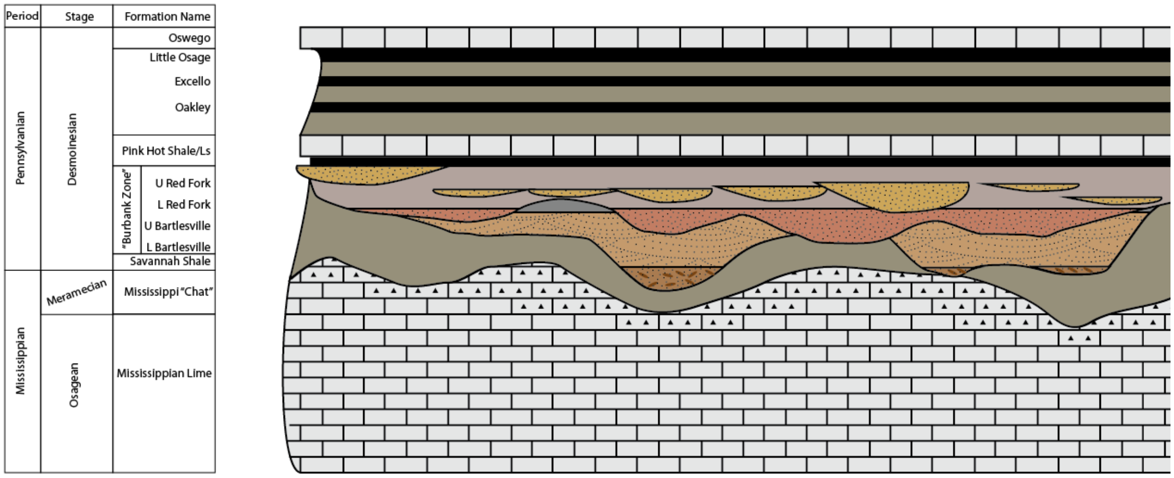

Figure 5 – Geological Depositional Model, NBU

As shown in Figure 5, multiple layers of caprock or "seals" are naturally provided above the reservoir, which is depicted as the "Burbank Zone" in Figure 5. These seal formations include the Hot Pink Limestone and the Oswego Limestone, each of which are impermeable and provide a reliable barrier to prevent injected CO_2 from moving upward towards the surface. These seal layers are depicted as "Marine Shales" in Figure 6 below, and the reservoir or "Burbank Zone" is indicated as "Channel Sandstones" in Figure 6.

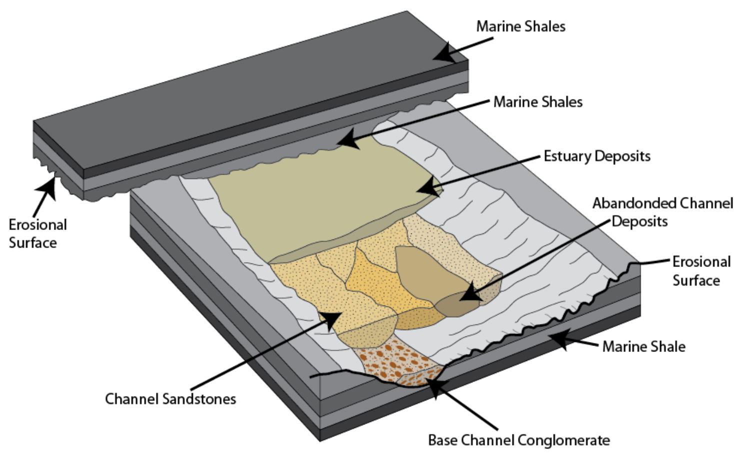

Figure 6 – 3D Rendering of Geological Depositional Model, NBU

Other than as described below, there are no known faults or fractures in the Burbank Field that provide a potential pathway for upward fluid flow. The fact that significant amounts of oil and natural gas have been produced from the reservoir is one confirmation of this fact and is indicative that a good quality natural seal exists. Oil and natural gas tend to migrate upward over time because they are less dense than brine found in various rock formations. Locations where oil and natural gas have been trapped in

the deep subsurface provide positive proof that faults and fractures do not provide a potential pathway for upward flow of injected CO_2 from the reservoir.

The operating history of the Burbank Field also demonstrates that there are no faults or fractures penetrating the reservoir, other than as described below. Fluids including water, carbon dioxide and polymers have been successfully injected into the NBU since 1950. The reservoir is characterized by east-west jointing, or fracturing, such that the effective permeability in the east-west direction is five times as great as that in the north-south direction. This results in a preferential east-west movement of injected fluids. For this reason, flooding operations in the NBU has generally developed by injecting water in east-west rows of wells and producing alternate rows of wells.[9] CO_2 injection has been similarly initiated, beginning in 2013. CO_2 and water are both injected in the CO_2-EOR portion of the NBU in a water alternating gas (WAG) process, where water is injected for a certain time period, followed by CO_2 for a certain time period, and then repeating the process. Water curtain injection (WCI) described below is the historic method used for decades during the waterflood in the NBU to address the flow of fluids within and external to the NBU unit boundary, and continues to be used during the CO_2-EOR flood operations. Other than as described above, there is no evidence of any interaction with existing or new faults or fractures. The absence of these faults and factures is one of the reasons why the NBU is such a strong candidate for water-flooding and now CO_2-flooding operations.

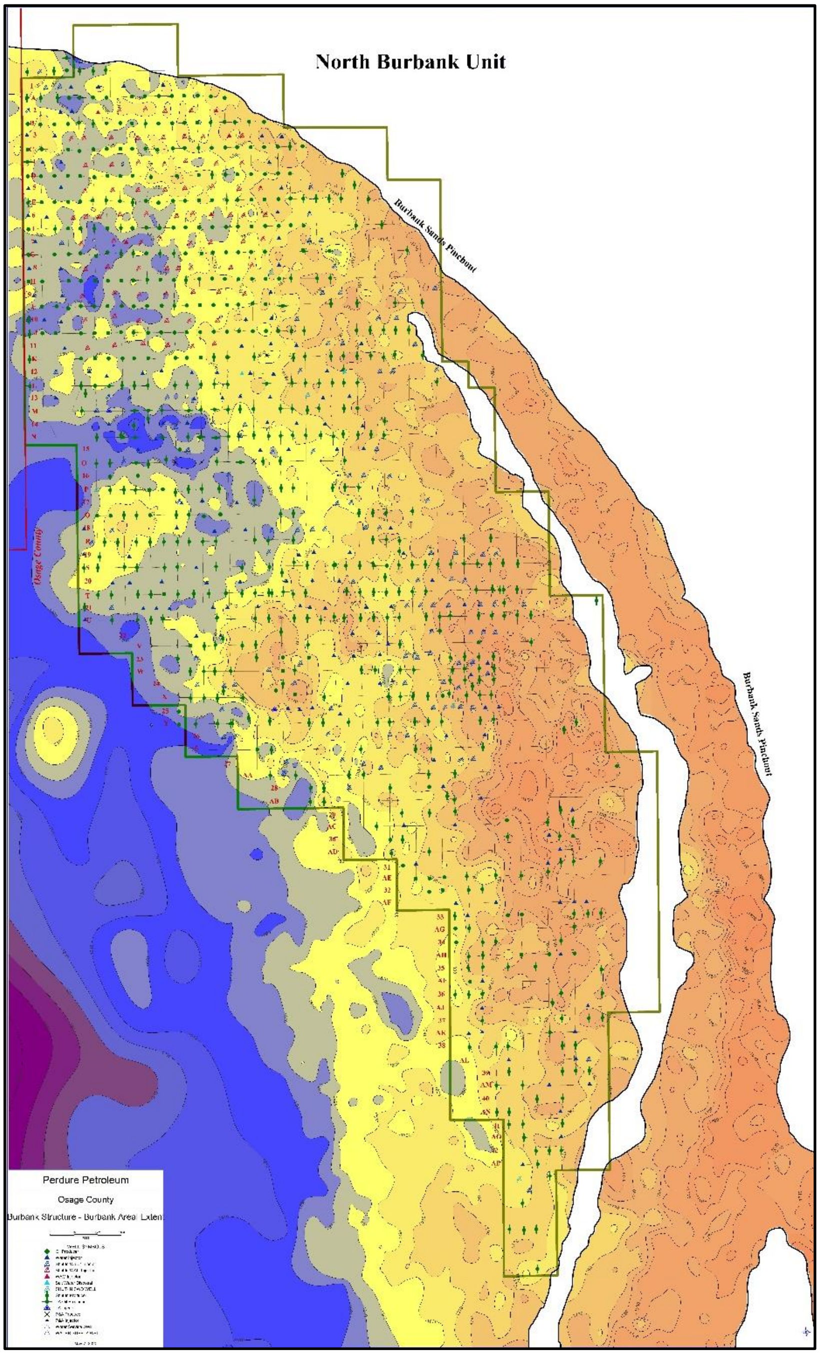

Figure 7 – Structure Map of the Top of the Burbank Sandstone

Figure 7 provides an overhead view of the geologic structure of the reservoir at the NBU, and the colors indicate changes in

[9] Kleinschmidt (1976).

subsurface elevation. In Figure 7 (on page 8), red/orange represents the higher elevations (i.e. the level closest to the surface) and blue/magenta represents the lower elevations (i.e. the level furthest below the surface). In the NBU, the higher elevations of the reservoir are to the east, southeast and south. The north half of the reservoir dips down in elevation to the west.

Buoyancy dominates the interaction of fluids in a reservoir. Gas is the lightest and rises to the top. Water is heavier and sinks to the bottom. Since oil is heavier than gas but lighter than water, it lies in between. Mobile CO_2 that is not miscible with the oil in the reservoir, whether in its gaseous phase or in its dense or supercritical fluid phase, is driven by buoyancy forces and gradually rises upward over time. Fluids including CO_2 and oil rise vertically until reaching the highest elevation in the structure. In the NBU, that highest elevation is to the east. Operationally, the reservoir boundaries of the NBU are maintained with a “water curtain”.

Water curtain injection (WCI) is a common operations method in the CO_2-EOR industry involving continuous CO_2 injection in a selected area, with the addition of peripheral continuous water injection (commonly along the oil-water contact). WCI operations are conducted to create a pressure barrier or “curtain” to contain the injected CO_2 within the desired reservoir or rock volume, to focus the injected CO_2 to the area selected for production, to maintain the CO_2 within the confines of a CO_2-EOR project, and to prevent the CO_2 from impacting areas in the reservoir that are not under CO_2 flooding operations. WCI operations are efficient methods of maintaining and controlling lateral migration of fluids to assure that CO_2 does not cross structurally deficient locations.[10]

Active reservoir management is permissible within the NBU unit boundary through the use of WCI operations to manage reservoir pressures of all injected fluids. While WCI operations at certain pressures maintain the injected CO_2 within the WAG area, CO_2 injection operations at certain pressures ensure the water injected via WCI operations does not interfere with active CO_2-EOR operations. WCI operations at the NBU allow pressure maintenance within the reservoir of all injected fluids for harmonized management of the entire reservoir.

Because of the WCI operations employed at the NBU unit boundaries, injected fluids (including CO_2) stay in the reservoir within the NBU unit boundary and do not move to adjacent areas. When water and supercritical CO_2 are injected into an oil reservoir, they are pushed from injection wells to production wells by the high pressure of the injected fluids. WCI operations are only required during dynamic conditions at the NBU such as injection into and production from the reservoir. When active WCI operations conclude, the CO_2 plume will be governed by gravity. When the CO_2-EOR operation is complete and injection of CO_2 is terminated, the injected CO_2 that is not dissolved in the remaining oil or water in reservoir will remain in the reservoir and will rise slowly upward due to buoyancy forces. However, at the NBU, the amount of CO_2 stored in the reservoir at that time will not exceed the secure storage capacity of the NBU reservoir. As explained in Section 2.2 above, the CO_2 stored in the NBU will fill approximately 46.7% of the total calculated storage capacity of the reservoir. As a result, there is more than enough pore space to retain the projected amount of stored CO_2.

[10] Nunez-Lopez (2017); Davis (2019); Hvorka (2015); Gaines (2009); and APGTF (2002).

Certain attributes of the reservoir are summarized in Table 1 below.

NBU Reservoir Characteristics (historic or current)

Unitized Area, acres	23,240
Area, square miles	~36.3
Depth, feet (average)	~2,900
Thickness, feet (average)	45 – 60
Dip	W-SW @ ~ 0.5^{o}
Porosity, percent average	16.8 – 22%
Permeability, millidarcies (md)	32 – 313
Water Saturation (Initial)	0.27 – 0.34
Viscosity of Oil, centipoise (cP)	~3
Permeability Variation (Dykstra-Parsons)	0.48 – 0.81
Boi (reservoir volume factor, reservoir bbls/stock)	1.23
Solution GOR (original), cf/STB	472
Reservoir Temperature, ^{o}F	122
API Stock Tank Oil Gravity	~39
Unit OOIP, MMSTBO	824
Fracture Pressure (at MMP), psig	~2,030
Original Reservoir Pressure, psia	1,350
Minimum Miscibility Pressure (MMP) (Slimtube), psia	~1,670
Pattern Size, acres	40
Primary Recovery, %OOIP	~18.1
Secondary Recovery, %OOIP	~20.7
Secondary to Primary Ratio	1.14
Tertiary (technically recoverable), %OOIP	12.6
Cumulative Oil Production, MMSTBO	~320
Cum Tertiary (CO_2-EOR) Production (to date), MMSTBO	3.4
Pore Volume, MM BBL	1,492.3

Table 1 – NBU Reservoir Historic or Current Characteristics

When wells are drilled, a detailed record of the geological formation is prepared either by taking samples through visual inspections or with the aid of measurement instruments lowered into the borehole. This detailed record, known as a well log, provides vital information regarding the rocks, fluids and other characteristics of the geology above, in, and below the target reservoir. Sometimes the drilling of a well also includes obtaining a rock sample (or core) from the wellbore at various elevations or formations. Numerous NBU wells have been drilled, logged and cored. NBU Well Nos. 22-42W and 22-27W are exemplar wells, and their core and log are provided below in Figure 8 (on page 11). Another type well log is for NBU Well No. 33-41W and is provided below in Figure 9 (on page 11).

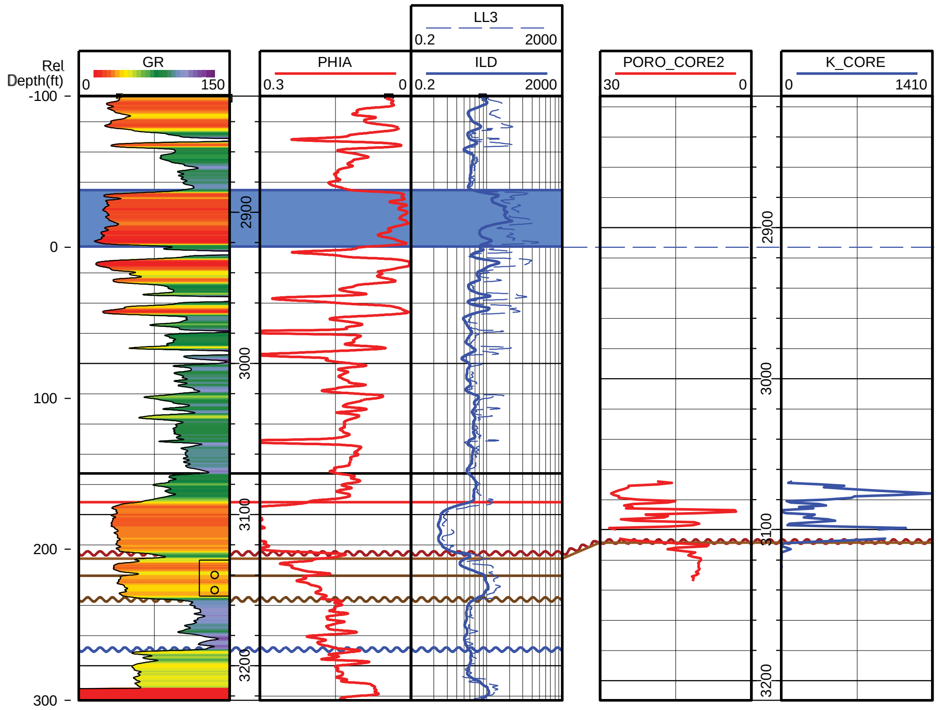

Figure 8 – Exemplar Conventional NBU Well Log and Core

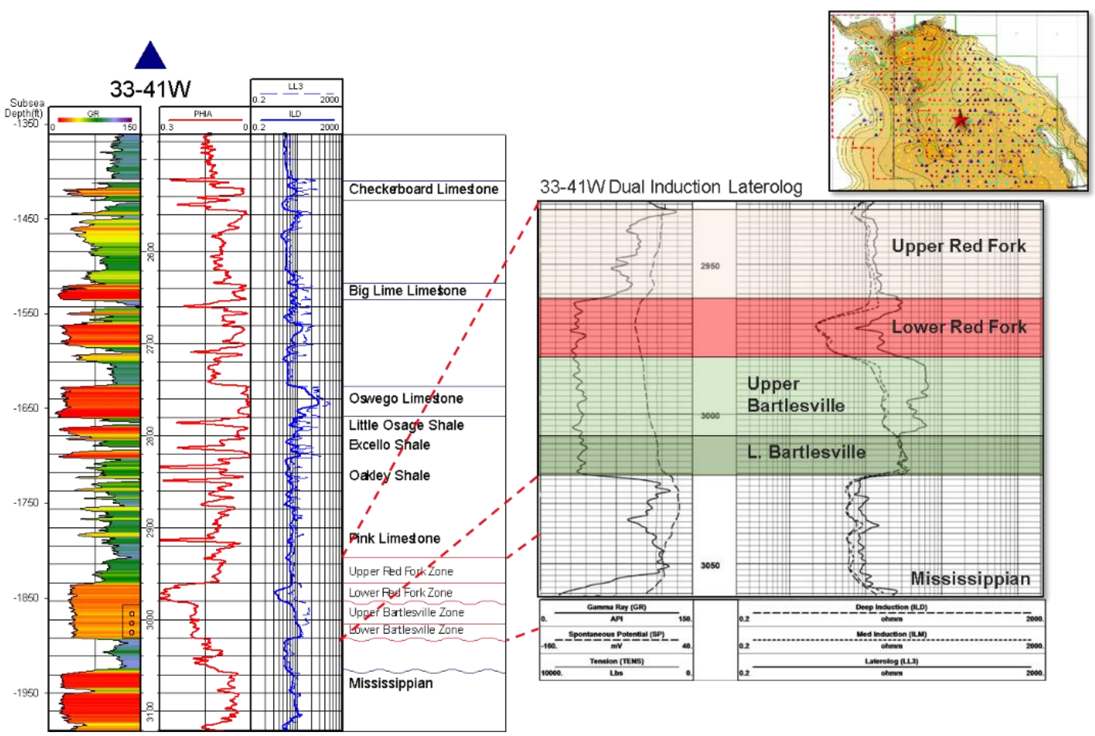

Figure 9 – Type Log of NBU Well

2.4. Operational History[11]

The Burbank Field in Osage County, Oklahoma, was discovered by the Marland Oil Company in May 1920. The Burbank Field was extended several miles to the southeast when The Carter Oil Company completed the second well in in September 1920. The Burbank Field was developed rapidly. Wells were drilled with cable tools and, upon completion, were produced wide open by flowing, swabbing, or pumping to capacity.[12] The wells were heavily shot upon completion or as soon thereafter as they quit flowing. Peak production of 122,000 barrels of oil per day was reached in July 1923. By 1924, 75% of the wells in the main part of the NBU had been drilled. Production declined rapidly because of the large volume of fluid being produced from the reservoir without any injection support.

The practice of pulling vacuum on wells began in 1924 to increase production. Vacuum was discontinued in 1939. Repressuring was inaugurated on a limited scale in 1926. Repressuring using natural gas purchased from outside the NBU was commenced in 1935 and continued for many years.[13]

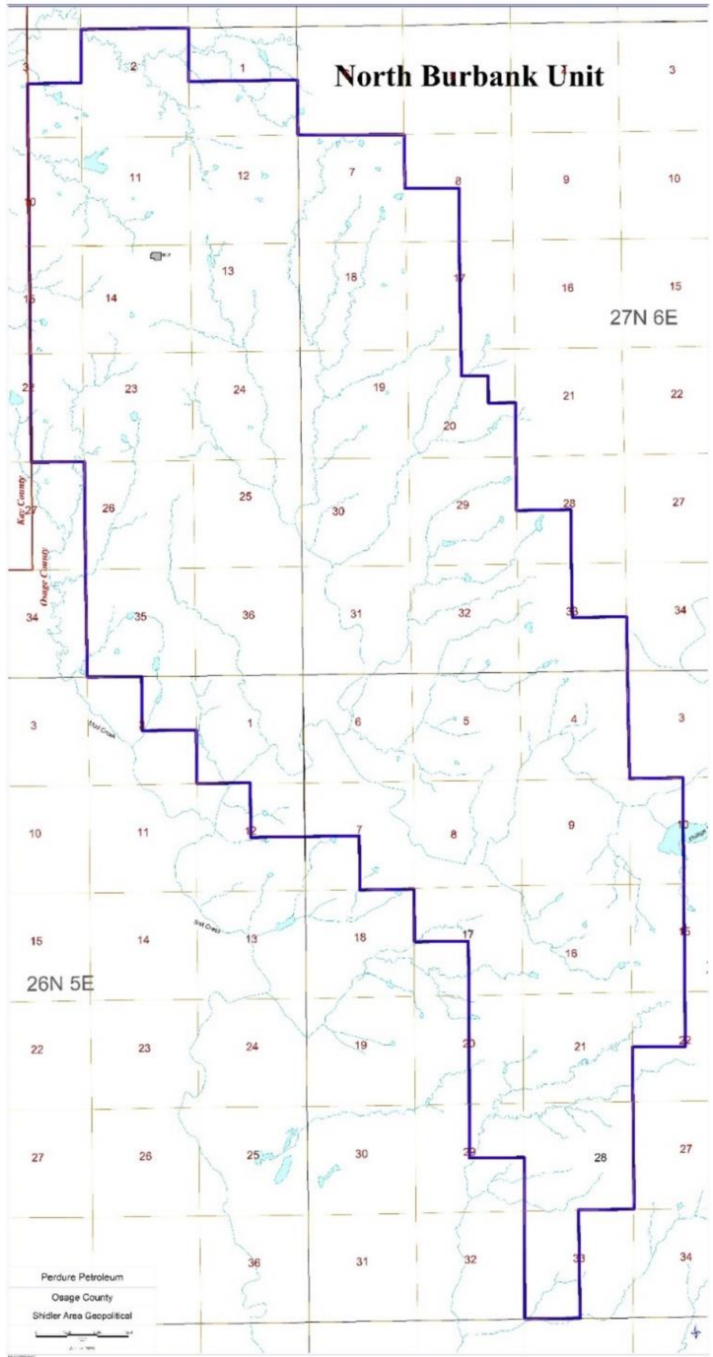

Figure 10 – North Burbank Unit Boundary Map

The NBU was originally developed by numerous individuals and companies under various separate leases from the Bureau of Indian Affairs (BIA) and the Osage Nation in Osage County. Over time, to improve efficiency, several smaller leases were combined or unitized into larger units which are operated without the operational restrictions imposed by the former lease boundaries. The NBU was formed in 1950. The NBU is the single largest oil recovery unit in the state of Oklahoma. The boundaries of the NBU are reflected in Figure 10.

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[11] Compiled from various reports including Bass Report 10 (1942); Hunter (1956), Li (2014); and Stafford (2014).

[12] "When gushers came in, earthen dikes were used to hold the oil until storage tanks could be built." http://www.tgp-docents.com/docent/osage.html

[13] Hunter (1956).

The NBU was unitized in 1950, coordinating 20 leaseholders with a unitized area of 23,240 acres. The boundaries of the NBU include the small unincorporated town of Webb City, Oklahoma, a booming oil camp in the 1920s, but with a population of less than 50 people today.

When oil was discovered in the Burbank Field in the 1920s, oil was found at the top of the sand in practically all wells, and there is no evidence of an initial gas cap. The reservoir energy was supplied almost entirely by dissolved gas in the oil. This type of oil reservoir offers good waterflooding opportunities.

Waterflooding was initiated in the NBU over a 15-year period beginning in 1949. Waterflooding the NBU was one of the world's largest waterflooding projects at that time.[14] Waterflooding began on the southern portion of the unit and was gradually extended toward the north until 1964 when it reached the northern edge.[15] Initial waterflood design of a 5-spot 20-acre spaced pattern quickly changed to a north-south elongated 5-spot 20-acre pattern developed in alternate east-west rows, accounting for a preferential east-west movement of injected fluid.[16] Phillips Petroleum Company operated the NBU beginning in 1950 upon unitization, and implemented the waterflood.

Starting in 1965, a steam drive pilot was conducted, but results were disappointing.[17] A successful polymer flood pilot test was conducted from August 1970 through 1979 on two particular tracts.[18] In the late 1970s, NBU Tract 97 was part of a multi-year Department of Energy (DOE) surfactant polymer pilot.[19] A commercial scale freshwater polymer flood was conducted in the Webb City area of the NBU beginning in 1980.[20]

CO_2-EOR operations began in the NBU on June 6, 2013 and has continued and expanded since that time. The experience at NBU of operating and refining the waterflood since 1950 and the CO_2-EOR flood since 2013 has created a strong understanding of the reservoir and its capacity to store CO_2.

Phillips Petroleum Company operated the NBU from unitization until November 1995, when Phillips sold the NBU to Calumet Oil Company.[21] Chaparral Energy bought the NBU from Calumet Oil Company on October 31, 2007. The current operator is Perdure Petroleum, which acquired the NBU from Chaparral in November 2017. Perdure Petroleum maintains a 99.25% working interest in the NBU and a 86.85% net revenue interest. The operator also owns significant portions of the surface within the NBU unit boundaries. The Osage Indian Nation owns 100% of the oil and gas minerals in Osage County, including the minerals in the NBU.

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[14] Li (2014); see also Reese, L.W., Loughlin, P., *Main Street Oklahoma: Stories of Twentieth-Century America*, p 106 (2013) ("At the time that it was instituted in 1949, the waterflood project in the North Burbank Field was one of the largest secondary recovery efforts in the history of the petroleum industry.")
[15] Pang (1981).
[16] Hunter (1956).
[17] Trantham (1982).
[18] Pang (1981).
[19] Bradford (1980).
[20] Pang (1981); Moffit (1993).
[21] Westermark (2003).

2.5. Description of Injection Process and Project Facilities

The injection process for the CO_2-EOR operations in the NBU generally consists of three (3) primary processes:

1. CO_2 distribution and injection
2. Injection and production wells
3. Produced fluids handling and gas compression

The CO_2 distribution and injection process begins with receiving CO_2 delivered to the NBU for purposes of injection. The CO_2 delivered to the NBU is supplied by one or more sources, such as CO_2 delivered from the Coffeyville CO_2 Pipeline and CO_2 received from the NBU Recycle Compression Facility (RCF). The delivered CO_2 is then sent through the injection pipeline distribution system to various CO_2 injection wells throughout the NBU.

The produced fluids handling system gathers fluids from the production wells in one or more areas within the NBU. While production wells in the NBU produce a mixture of oil and water fluids, some of the production wells also produce CO_2 or other gases. The mixture of produced fluids (oil, water and CO_2 and other gases) flows to satellite batteries for separation and/or to centralized tank batteries where gases and fluids are separated. The fluids stream is further separated into oil that is sold by truck or pipeline, and water that is recovered for reuse, reinjection or disposal. The gas stream, consisting of CO_2 and other gases, is transported to the RCF.

The produced gas compression process consists of gathering CO_2 and other gases that may be produced from the active CO_2-EOR portion of the NBU, and compressing the CO_2-rich gas stream for ultimate reinjection into the NBU. Currently the RCF is the only facility that performs this function, but additional recycle compression facilities may be installed in the future and would provide the same function. In addition, natural gas liquid (NGL) recovery operations may be installed at the RCF or other recycle compression facilities in the NBU in the future, to separate NGLs from the stream of CO_2 and other gases, and the NGLs would be sold by truck or pipeline.

2.5.1. CO_2 Distribution and Injection

Currently, CO_2 delivered to the NBU for injection is received through many meters. One meter measures the amount of CO_2 at each CO_2 source location. Another meter measures the amount of CO_2 delivered from the Coffeyville CO_2 Pipeline. Other meters measure the amount of CO_2 at the outlet of the NBU RCF compressors, and a central meter (downstream of all RCF compressors) may be installed at the outlet of the RCF. As the NBU is developed for CO_2-EOR purposes, it is anticipated that CO_2 delivered to the NBU for injection may be received through additional meters, such as from additional recycle compression facilities in the NBU or other CO_2 sources of pipeline delivery points.

All CO_2 that flows through the meters is sent through CO_2 injection lines to individual injection wells in the NBU, and in many instances through manifolds and distribution lines prior to arriving at the injection well. Currently, each CO_2 injection well has the ability to inject either CO_2 or water, at various rates and injection pressures, as determined by the EOR operator. A flow meter is used at each injection well to measure the injection rate of the CO_2 (or water, as the case may be). Currently, for any given CO_2 injection well, the CO_2 injected may be sourced from the Coffeyville CO_2 Pipeline, the RCF, or a combination thereof.

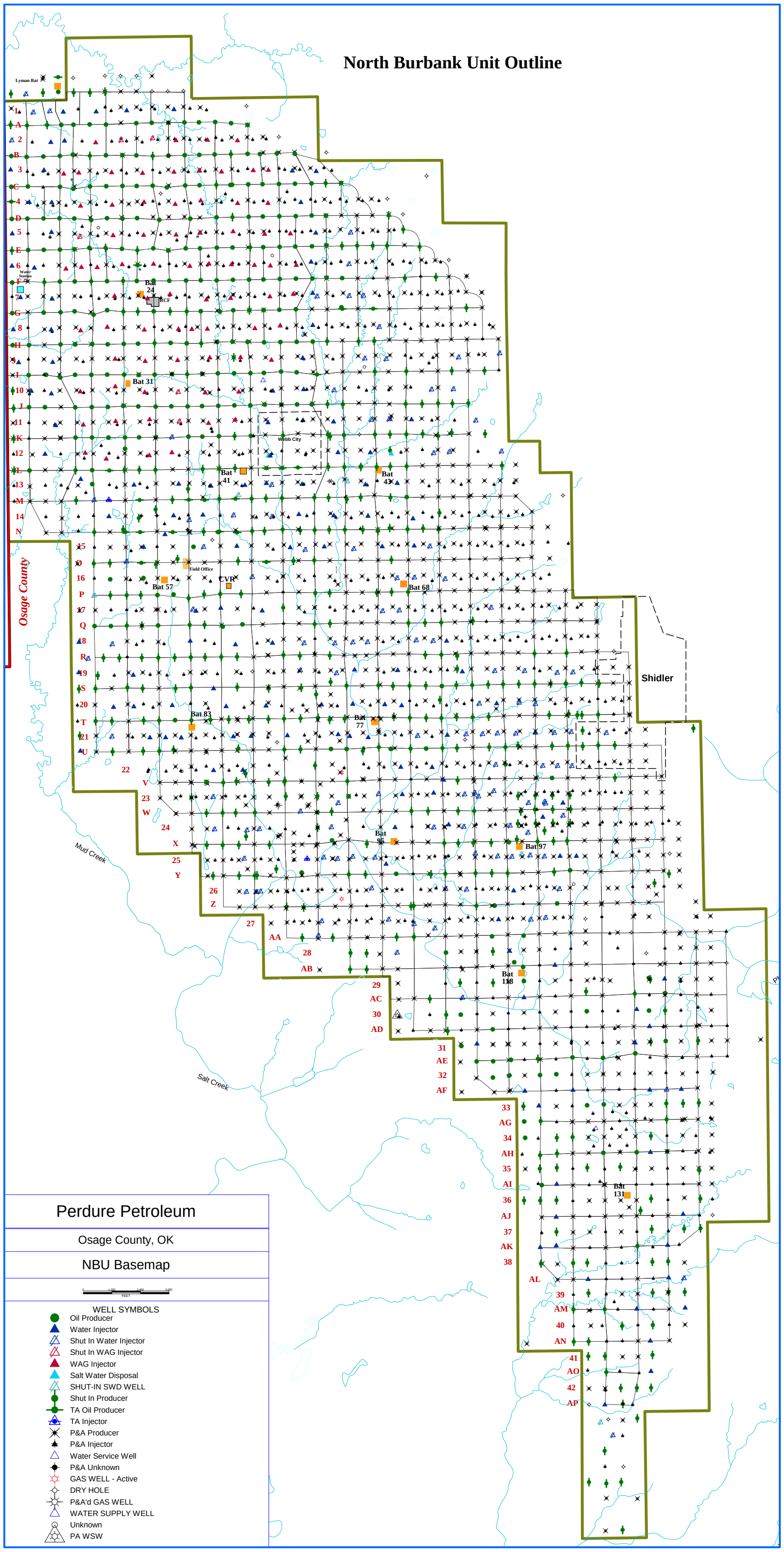

Figure 11 – North Burbank Unit Wells as of January 2020

As of January 2020, about 100 MMSCF/d (5,250 MT) of CO_2 is injected into the NBU each day, of which approximately 45% is from the Coffeyville CO_2 Pipeline and the balance (55%) is recycled CO_2 from the RCF. The ratio of CO_2 sources is expected to change over time, and eventually the percentage of recycled CO_2 will increase, and deliveries of CO_2 from the Coffeyville CO_2 Pipeline will taper off. There are volume meters at the inlet and the outlet of the RCF.

2.5.2. Injection and Production Wells

As of January 2020, there are approximately 451 active completed wells in the NBU. Those wells consist of about 266 production wells, and about 185 injection wells. In addition, there are about 2,394 wells that are not in use, such as being inactive, temporarily abandoned, shut in, or plugged and abandoned. As a result, the total number of wells in the NBU is currently about 2,845 wells. The location of the NBU wells is indicated in Figure 11.

Wells located in Osage County, Oklahoma are regulated by the EPA Region 6 office. The EPA Region 6 granted authority to inject CO_2 into the NBU pursuant to Underground Injection

Control (UIC) permits for the NBU, which state that permit authorization must be obtained from the Bureau of Indian Affairs (BIA) for various activities related to the NBU CO_2-EOR operations. Those permits also state that the base of underground sources of drinking water is 245 feet below the surface. Regulations and/or the permit(s) require that all wells drilled through this interval be cased and cemented to prevent the movement of fluids from the injection zone into another zone or to the surface around the outside of a casing string.

2.5.3. Produced Fluids Handling and Gas Compression

Upon injection of CO_2 or water into the reservoir, a mixture of oil, gas and water (collectively, "produced fluids") is moved towards a production well. Once produced at the production well, the produced fluids are produced into gathering lines that combine, collect and commingle the produced fluids. In the CO_2-EOR portion of the NBU, the produced fluids then flow into a satellite separation facility and then to a battery. Each satellite is equipped with well test equipment to measure production rates of oil, gas and water from individual production wells. In addition, CO_2 and liquids are separated at the satellites. In the portion of the NBU where CO_2 is not injected (waterflood only area), the produced fluids flow directly into a battery. Production in the NBU is from one of the active production wells, which is sent to one of eight batteries (two in the CO_2-EOR area, and six in the waterflood only area). Each battery has a large vessel that performs a gas-liquid separation.

Once any remaining gas and fluids are separated at the batteries in the CO_2-EOR portion of the NBU, the gas phase is transported by pipeline to a recycle compression facility ("RCF") for additional separation and then compression, dehydration and pumping as described below. The average composition of this gas mixture is approximately 95-99% CO_2 and the remaining portion is composed of hydrocarbons, a trace of nitrogen, and hydrogen sulfide (H_2S) at approximately 50-165 parts per million (ppm). This CO_2 concentration is likely to change over time as CO_2-EOR operations continue and expand. The CO_2 at the outlet of the RCF is transported to the injection system described in Section 2.5.1 above.

Produced oil from the NBU is metered through one or more Lease Automatic Custody Transfer (LACT) units located at centralized tank batteries in the NBU, prior to being sold. Currently, the LACT units in the CO_2-EOR portion of the NBU are Tank Batteries 24 and 31. This oil contains a small amount of dissolved or entrained CO_2. A recent sample of oil indicated that the dissolved CO_2 content is approximately 0.26-0.31% by weight in the oil. Any gas that is released from the liquid tanks at Tank Batteries 24 and 31 is collected by one or more Vapor Recovery Units (VRU) that compresses the gas and sends it to an RCF for processing. This gas stream may include trace amounts of CO_2.

The oil produced from the NBU is slightly sour, containing small amounts of hydrogen sulfide (H_2S), which is highly toxic. All field personnel are required to wear H_2S monitors. Although the primary purpose of those monitors is to detect H_2S and protect employees, monitoring of H_2S will also supplement other CO_2 leak detection methods described in this MRV Plan.

2.5.4. Modifications to Project Facilities and Injection Processes

Perdure plans to continue routine business operations in and near the NBU, which may include securing CO_2 from additional sources; changing the status of existing wells, adding new wells, closing wells; deepening existing wells or drilling new wells to a deeper formation for CO_2 injection into that deeper formation; and adding new facility equipment or pipelines. These modifications represent a continuation of the current integrated configuration and MRV approach and are not a material change that would trigger a revised plan required by Section 98.448(d). Any such changes would be indicated in

the annual monitoring report rather than in a new or amended MRV plan. Prior to any CO_2 injection into a deeper formation, Perdure would comply with the statutory and regulatory process for obtaining all necessary permits. New facility equipment additions could include additional recycle compression facilities in the NBU. Any such changes reflected in an annual monitoring report would include, as necessary, a description of how the change is a continuation of the existing project facilities and injection process and would also include any new site characterization, risk assessment, monitoring and mass balance information.

3. Delineation of the monitoring areas and time frames

The current active monitoring area (AMA) as well as future AMA are described below. In addition, the maximum monitoring area (MMA) of the free phase CO_2 plume and its buffer zone are defined below. Also, the monitoring time frames for both the AMA and the MMA are described.

3.1. Active Monitoring Area

Because CO_2 is present in the NBU, and is retained within that area, the current active monitoring area (AMA) is defined by the boundary of the NBU. This boundary is reflected in Figure 10 (on page 12). The following factors were considered in defining this boundary:

- CO_2 is present in the NBU. More than 143.8 BCF (7.58 MMT) of CO_2 has been injected into the NBU since 2013. There has been infill drilling in the NBU to complete additional wells to further optimize production. There has been production of CO_2 in the NBU. Operational results thus far indicate that there is CO_2 in the NBU.

- CO_2 injected into the NBU remains contained within the NBU because of the fluid and pressure management impacts associated with CO_2-EOR operations. Managed lease-line injection and production wells are used to retain fluids in the NBU. Water curtain injection (WCI) operations, described in Section 2.3, have been used for decades in the NBU to retain fluids in the NBU, including the CO_2-EOR portion of the NBU since CO_2 injection began in 2013. There is evidence that operations by the prior EOR operator failed in some instances to maintain the water curtain in the CO_2-EOR area of the NBU as a result of over-producing the western edge of the active CO_2-EOR area and allowing small amounts of injected CO_2 to move outside the west edge of the NBU. Current operations strictly maintain the water curtain so as to prevent such CO_2 migration in the reservoir. Current operational results (such as normal pressures in the injection interval and injection and production rates within predicted ranges) indicate that injected CO_2 is retained in the NBU. Should future WCI operations fail to adequately maintain sufficiently high injection pressures so as to retain injected CO_2 within the CO_2-EOR area of the NBU, it is anticipated that small amounts of injected CO_2 could possibly move outside that area. In that event, Perdure would respond as described in Section 4.6 and Section 5.5.

- Over geologic timeframes, injected CO_2 will remain in the NBU and will not migrate downdip to the western edges of the NBU, because the reservoir in the unit boundary of the NBU is higher in elevation than the reservoir west of the NBU unit boundary. While the reservoir in the Stanley Stringer to the east and northeast of the NBU is higher in elevation than the reservoir in the NBU, water curtain injection (WCI) operations described in Section 2.3 have been used to isolate the Stanley Stringer and the NBU for decades, and will continue to be used. Just as oil and gas were trapped in and contained in the NBU, as demonstrated by the long history of oil and gas production occurring within the NBU, so will the injected CO_2.

As CO_2 injection operations are expanded beyond the currently active CO_2-EOR portion of the NBU into other areas of the NBU, then the AMA is anticipated to expand to include areas within the NBU into which the CO_2 is injected. Such expansions will be reported in the Subpart RR Annual Report for the NBU, as required by Section 98.446.

3.2. Maximum Monitoring Area

The maximum monitoring area (MMA) is defined in Section 98.449 as equal to or greater than the area expected to contain the free-phase CO_2 plume until the CO_2 plume has stabilized, plus an all-around buffer zone of one-half mile. Section 4.1 states that the maximum extent of the injected CO_2 is anticipated to be bounded by the NBU unit boundary. Therefore, the MMA is the NBU plus the one-half mile buffer as required.

3.3. Monitoring time frames

The primary purpose for injecting CO_2 in the NBU is to produce oil that would otherwise remain trapped in the reservoir. The primary purpose for injecting CO_2 in the NBU is not, as stated in UIC Class VI regulations at 40 CFR 146.81(b), "specifically for the purpose of geologic storage." During a Specified Period, there will be a subsidiary or ancillary purpose of establishing the long-term containment of a measurable quantity of CO_2 in the reservoir. The Specified Period will be shorter than the period of oil production from the NBU. This is in part because the delivery of CO_2 for injection from sources other than a recycle compression facility is projected to taper off significantly before oil production ceases in the NBU, which is modeled through 2060. At the conclusion of the Specified Period, a request for discontinuation of reporting under Subpart RR will be submitted. This request will be submitted when it can be demonstrated that then-current monitoring and/or model(s) show that the cumulative mass of CO_2 reported as sequestered during the Specified Period is not expected to migrate in the future in a manner likely to result in surface leakage. It is expected that it will be possible to make this demonstration within three years after injection for the Specified Period ceases. The demonstration will rely on at least the following three principles: (1) the amount of CO_2 stored in any properly P&A'd wells will be considered unlikely to migrate to the surface; (2) the continued process of fluid management during the years of CO_2-EOR operation after the Specified Period will contain injected fluids in the NBU; and (3) the cumulative mass reported as sequestered during the Specified Period is a fraction of the theoretical storage capacity of the NBU.

4. Evaluation of Leakage Pathways

The reservoir in the NBU has been studied and documented extensively for decades, including through the publications listed in Section 12.6. Knowledge gained through the 100+ year history of oil and gas production in the NBU has been used to identify and assess potential pathways for leakage of CO_2 to the surface. The following potential pathways are reviewed below:

- Well bores
- Faults and fractures
- Natural and induced seismic activity
- Prior operations
- Pipeline and surface equipment
- Lateral migration outside the NBU
- Drilling through the CO_2 area

- Diffuse leakage through the seal

4.1. Well Bores

As of January 2020, there are approximately 451 active completed wells in the NBU. About 266 of those wells are production wells and about 185 are injection wells. In addition, there are approximately 2,394 wells not in use that penetrate the reservoir, as described in Section 2.5.2 above. Leakage through existing and future well bores is a potential risk in the NBU that Perdure works to prevent by:

- adhering to regulatory requirements for well drilling and testing
- implementing best practices that Perdure has developed through its extensive operating experience
- monitoring performance of injection and production operations
- monitoring wellbore integrity and surface operations
- maintaining surface equipment

Regulations governing wells in the NBU require that wells be completed and operated so that fluids are contained in the strata in which they are encountered and that well operation does not pollute subsurface and surface waters. The regulations establish the requirements with which all wells must comply, whether they are injection, production or disposal wells. Depending on the purpose of the well, the regulatory requirements can impose additional standards for evaluation of area of review (AOR). CO_2 injection well permits are authorized only after an application, notice and opportunity for a hearing. As part of the application process, Perdure conducts an AOR that includes wells within the NBU and one-quarter mile from the set of wells considered in that AOR. Pursuant to Environmental Protection Agency regulations, all wells within the AOR that penetrated the injection interval were located and evaluated.

Regulatory requirements can also impose additional standards for mechanical integrity testing (MIT). All active injection wells must undergo a periodic MIT, depending on various dates and activities associated with the well. MIT tests include inspection of wells and associated surface facilities to ensure they are in good repair, free of leaks, and conform with various rules and permit conditions. MIT tests also include the use of a pressure recorder and pressure gauge and testing the casing-tubing annulus for a minimum amount of time at a minimum pressure.

In implementing those regulations, Perdure has developed operating procedures based on its experience as a CO_2-EOR operator. Perdure's operations include developing detailed modeling at the pattern level to guide injection pressures and performance expectations, as well as utilizing experts in diverse disciplines to operate EOR projects based on specific site characteristics. Perdure's field personnel are trained to operate wells in a manner to look for and address issues promptly, and to implement corrosion prevention techniques to protect wellbores as needed. Field personnel also are required to wear H_2S detectors and, because H_2S is entrained in the CO_2, the H_2S detector would alarm if field personnel are near equipment that leaked CO_2. Perdure's operations are designed to comply with the applicable regulations and to ensure that all fluids (including oil, water and CO_2) remain in the NBU until they are produced through a Perdure well.

New wells that are drilled into the reservoir are designed to be cemented all the way from the formation to the surface. Figure 12 (on page 20) depicts a diagram of a typical new well drilled in the NBU, and provides an example of well construction showing intervals of cement over crucial formations. As of

January 1, 2020, approximately 17 of the 451 active completed wells have been drilled in this manner, and 100% of the new wells that have been drilled since Perdure took over operations of the NBU in 2017 have been drilled in this manner.

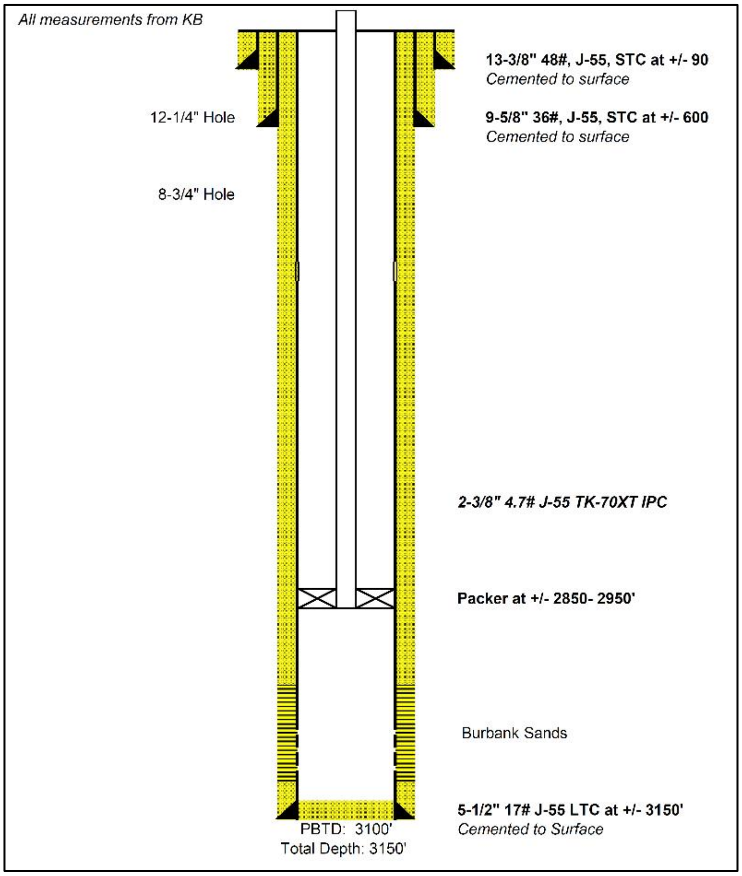

Figure 12 – Typical New Drill Well Bore Diagram

Well pressure in injection wells is monitored on a continual basis. The injection plans for each pattern are programmed into the injection WAG satellite, as discussed in Section 6.4, to govern the rate, pressure, and duration of either water or CO_2 injection. Pressure monitors on the injection wells are programmed to flag pressures that significantly deviate from the plan. Leakage on the inside or outside of the injection wellbore would affect pressure and be detected through this approach. If such excursions occur, they are investigated and addressed. It is the company's experience that few excursions result in fluid migration out of the intended zone and that leakage to the surface is very rare.

In addition to monitoring well pressure and injection performance, Perdure uses the experience gained over time to strategically approach well maintenance and updating. Perdure maintains well maintenance and workover crews onsite for this purpose. For example, well classifications by age and construction method inform Perdure's plan for monitoring and updating wells. Perdure uses all of the information at hand including pattern performance, and well characteristics to determine well maintenance schedules.

Production well performance is monitored using the production well test process conducted when produced fluids are gathered and sent to a satellite battery. There is a routine cycle for each satellite battery, with each well being tested approximately once every two months. During this cycle, each production well is diverted to the well test equipment for a period of time sufficient to measure and sample produced fluids (generally 8-12 hours). This test allows Perdure to allocate a portion of the produced fluids measured at the satellite battery to each production well, assess the composition of produced fluids by location, and assess the performance of each well. Performance data are reviewed on a routine basis to ensure that CO_2 flooding is optimized. If production is off plan, it is investigated and any identified issues addressed. Leakage to the outside of production wells is not considered a major risk because of the reduced pressure in the casing. Also, personal H_2S monitors are designed to detect leaked H_2S around production wells.

Field inspections are conducted on a routine basis by field personnel. On any day, Perdure has approximately 32 personnel in the field in the NBU, as of January 2020. Leaking CO_2 is very cold and leads to formation of bright white clouds or dry ice, either of which is easily spotted. All field personnel are trained to identify leaking CO_2 and other potential problems at wellbores and in the field. Any CO_2 leakage detected will be documented and reported, quantified and addressed as described in Section 5.

Continual and routine monitoring of well bores and site operations will be used to detect leaks, as further described in Section 6.1. Based on these activities, Perdure will mitigate the risk of CO_2 leakage through existing well bores by detecting problems as they arise and quantifying any leakage that does occur. Section 5 summarizes how CO_2 leakage from various pathways will be monitored and responded to. Section 6 describes how any such leakages will be input into the mass-balance equation.

4.2. Faults and Fractures

Other than as described in Section 2.3 above, there are no known faults or fractures in the reservoir that provide a potential pathway for upward fluid flow. Locations where oil and natural gas have been trapped in the deep subsurface provide positive proof that faults and fractures do not provide a potential pathway for upward flow of injected CO_2 from the reservoir. As described in Section 2.3, the reservoir is characterized by east-west fracturing, which results in a preferential east-west movement of injected fluids. This fact led to early adjustments of the waterflood in the 1950s, and all flooding operations since that time. The waterflood and the CO_2-EOR operations in the NBU is generally developed by injecting water/CO_2 in east-west rows of wells and producing alternate rows of wells. Water curtain injection (WCI) described in Section 2.3 is the historic method used for decades during the waterflood in the NBU to address the flow of fluids within and external to the NBU unit boundaries, and continues to be used during the CO_2-EOR flood operations. Other than as described above, there is no evidence of any interaction with existing or new faults or fractures.

Perdure has extensive experience in designing, implementing and operating EOR projects to ensure that injection pressures will not damage the oil reservoir by inducing new fractures or creating shear. Injection pressures are monitored so that injection pressures will not exceed fracture pressures, even if injection well permits authorize injection pressures that exceed fracture pressures.

4.3. Natural and Induced Seismic Activity

There is no direct evidence that natural seismic activity poses a significant risk for loss of CO_2 to the surface in the NBU.

Determining whether seismic activity is induced, or triggered by human activity, is difficult. In the past 10-15 years, north central Oklahoma has experienced a significant increase in earthquakes. This increase is depicted in Figure 13 (on page 22), which show the earthquake densities in Oklahoma prior to 2009, and then again from 2009-2018. Osage County is outlined in blue, and there are very few if any of these recent earthquakes in Osage County.

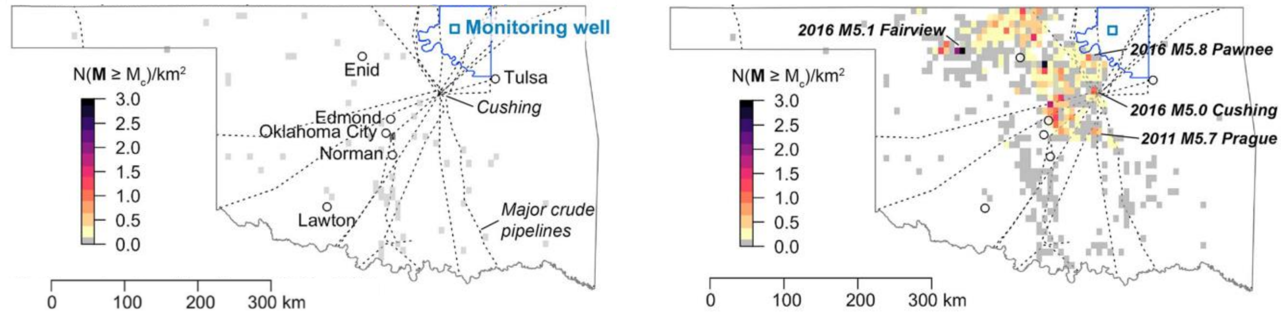

Figure 13 – Oklahoma Earthquake Densities: Prior to 2009 (left) and 2009 – 2018 (right)[22]

Over the past 10-15 years, the Cherokee Platform in north central Oklahoma was targeted by many oil and gas companies for horizontal shale oil drilling. Many of these production wells, including those from the Mississippi Limestone formation, yielded significant volumes of saltwater along with the hydrocarbons, and the produced saltwater was commonly disposed of into deeper formations such as those in the Arbuckle Group. Injection of this produced saltwater into the Arbuckle, which directly overlies crystalline basement rock in areas outside the NBU, has been proposed to perturb the stresses on basement faults, causing them to slip and contributing to at least some increased density of earthquakes. "The majority of the observed earthquakes [from 2009 to 2016] were traced to the crystalline basement."[23]

However, Osage County has a much different experience to report:

> "An Oklahoma seismicity map shows Osage County as an anomalously "quiet" region. Seismicity in counties surrounding Osage County experienced hundreds of earthquakes during the past couple of years, yet the area of Osage experienced less than a dozen earthquakes in the decades-long history of the Oklahoma seismic network."[24]

In a recent study focused on the injection of produced saltwater in Osage County into the Arbuckle formation, the study agreed that Osage County is a "seismically quiet location with a high density of active disposal wells".[25] The study also demonstrates that the Arbuckle is more thick on the western edge of Osage County where the NBU unit boundary is located, and is less thick both to the east and to the west of the western edge of Osage County,[26] indicating that western Osage County (and the NBU area) has a lower seismic risk than the surrounding area related to injection into the Arbuckle.

In some instances of induced seismic activity in Oklahoma over the past 15 years, the water was injected into a saline aquifer formation immediately above or very near the basement rock. However, as a recent study noted, the details of how the Arbuckle contacts with the Precambrian basement rock tends to vary spatially.[27]

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[22] Barbour (2019).
[23] Kibikas (2019).
[24] Crain (2017).
[25] Barbour (2019).
[26] Barbour (2019).
[27] Barbour (2019).

Documented instances of induced seismicity have not been reported within the NBU boundary. A primary reason is demonstrated in Figure 4 (on page 6), which shows that the reservoir into which the water (and now CO_2) is approximately 3,000 feet deep, but the basement granite is located half again as deep, at approximately 4,400 feet. The reservoir into which the CO_2 is injected (the Burbank) is well above the basement rock. During the specified period, Perdure's injection of CO_2 into the reservoir within the NBU unit boundary will not involve injection into a formation immediately above or near the basement rock.

Perdure is injecting CO_2 into the Burbank reservoir, which is shallower than the deeper Arbuckle formation. Perdure is not injecting CO_2 into the Arbuckle formation. The injection of CO_2 by Perdure into the reservoir within the NBU is not only for EOR purposes but also for the additional purpose of maintaining pressures in the reservoir as other fluids are produced from the reservoir. This is a very different operation than injecting produced water to constantly increase pore pressure.

Controlled high pressure injection of water into the reservoir has been ongoing since 1949 without any documented instances of induced seismicity. This history of over 70 years of injection into the reservoir tends to demonstrate the low seismic risk associated with reservoir operations.

Since 2014, the State of Oklahoma's Coordinating Council on Seismic Activity (CCSA) has organized state resources and other activities related to increased seismic activity in the State, and provides collaboration among interested stakeholders including industry, regulators, academia, non-governmental organizations, and environmental-focused associations. The CCSA shares data, studies, developments, and proposed actions related to earthquakes in Oklahoma. The State of Oklahoma maintains one of the nation's most robust seismic monitoring systems, and that system (along with actions taken by regulators and industry participants) has resulted in a dramatic decrease in the incidence of significant earthquakes in Oklahoma. This is shown in four separate figures in Section 12.4, showing the increase and then the decrease in the number of significant earthquakes in the geographic area around and including the NBU. This trend of induced seismic activity demonstrates that actions taken in recent years have significantly reduced the risk of earthquakes caused by injection of produced water into the Arbuckle formation – none of which involves the NBU unit boundary geographic area, and none of which involves the reservoir which is approximately 1,400 less deep compared to the Arbuckle formation.

Section 12.4 demonstrates that, since 1980, the nearest earthquake to the NBU was south of White Eagle, Oklahoma, approximately 25 miles from the NBU. The nearest large earthquake was in Pawnee, Oklahoma in 2016, which is nearly 35 miles away from the NBU. Perdure is not aware of any reported loss of CO_2 or water to the surface in the NBU associated with any seismic activity.

A concern about induced seismicity is that it could lead to fractures in the seal, providing a pathway for CO_2 leakage to the surface. However, the subject wells injecting produced wastewater into the Arbuckle formation are injecting fluids at approximately 3,500 feet deep, which is about 500 feet lower than the reservoir in the NBU that contains the injected CO_2. Moreover, there have been no reports of loss of injectant (wastewater or CO_2) to the surface associated with any seismic activity.

Therefore, there is no direct evidence to suggest that natural seismic activity poses a significant risk for loss of CO_2 to the surface from the NBU. If induced seismicity resulted in a pathway for material amounts of CO_2 to migrate from the injection zone, then other reservoir fluid monitoring methods (such as reservoir pressure, well pressure and pattern monitoring) would lead to further investigation.

4.4. Prior Operations

In 2013, CO_2 flooding began in the NBU. Perdure and prior operators have maintained records of the NBU, including active and abandoned wells. Perdure's standard practice in drilling new wells includes a review of records to ensure that drilling will not cause damage to any nearby active or abandoned well. AOR requirements include identification of all active and abandoned wells in the AOR, and implementation of procedures to ensure integrity of active wells. Perdure and prior operators have checked for the presence of old, unknown wells throughout the NBU over many decades. These practices ensure that identified wells are sufficiently isolated and do not interfere with the CO_2 injection, enhanced oil recovery, and reservoir pressure maintenance operations. This operational experience supports the conclusions that there are no unknown wells within the NBU and that the risk of migration from older wells has been sufficiently mitigated. To Perdure's knowledge, no prior operations have impaired the CO_2 injection confining zone.

4.5. Pipeline and Surface Equipment

Leakage of CO_2 through pipelines and surface equipment in the NBU is a potential risk. The risk of unplanned losses of CO_2, including damage to or failure of pipelines and surface equipment, is reduced to the maximum extent practicable through the use of prevailing design and construction practices, routine maintenance, periodic inspection procedures as well as maintaining compliance with applicable regulations. The facilities and pipelines currently utilize and will continue to utilize materials of construction and control processes that are standard for CO_2-EOR projects in the oil and gas industry. Operating and maintenance practices currently follow and will continue to follow demonstrated industry standards. In addition, Perdure's field operations include frequent routine visual inspection of surface facilities, which will provide an additional way to detect leaks and further support Perdure's efforts to detect and remedy any leaks in a timely manner. Finally, amounts of CO_2 lost through this potential leakage pathway will be determined by: (a) following the Subpart W Methodology Approach described in Section 5.5 below; (b) using direct metering to measure specific venting events, and (c) using engineering best practices to estimate a loss in the rare event of an extreme event.

4.6. Lateral Migration

There is a potential risk of injected CO_2 in the NBU migrating in the reservoir to an area outside the unit boundary of the NBU. However, as described in Section 2.4, the NBU waterflood design was adjusted in the 1950s to account for a preferential east-west movement of injected fluid in the reservoir. For many decades, the injection pattern in the NBU has been a north-south elongated 5-spot 20-acre pattern on alternating east-west rows. Currently, the CO_2-EOR area of the NBU is operated on 5-spot 40-acre injection patterns, with alternating east-west rows of injectors and producers. This operations method has successfully maintained injected water and CO_2 in the reservoir within the NBU unit boundary. Because Perdure has no intentions of changing this operational injection pattern, this risk of lateral migration is significantly reduced.

Water curtain injection (WCI) methods are also deployed during CO_2-EOR operations to prevent CO_2 lateral migration out of the unit boundary. As described in Section 2.3, continuous WCI operations are conducted at the NBU unit boundaries to create a pressure barrier to contain injected fluids within the NBU. WCI operations efficiently and effectively maintain and control lateral migration of fluids to assure that the CO_2 does not cross NBU unit boundaries. CO_2 injection and production operations are conducted based on lessons learned from prior operations and provide added measures of protection against any potential leakage of CO_2 from the reservoir. An earlier operator's over production of the western water curtain, described in Section 3.1, demonstrates the importance of managing WCI operations in the NBU. Upon assuming ownership of the NBU in 2017, Perdure modified the CO_2 injection and production operations to prevent over production of the water curtain on the NBU's western edge, which is downdip in the reservoir. Due to Perdure's WCI operations at the NBU unit boundaries, injected fluids (including CO_2) are maintained in the reservoir within the NBU unit boundary and do not move to adjacent areas, much like how operations were successfully conducted during decades of the waterflood (1950s-2013). As a result, it is unlikely that injected CO_2 will migrate downdip and laterally outside the NBU because of the nature of the geology and Perdure's approach used for injection. Should such leakage occur, Perdure plans to determine the most appropriate methods for quantifying the volume leaked, which would likely include measured or engineering estimates of relevant parameters (e.g. CO_2 flow rate, concentration, duration), and will report it as required as part of the annual Subpart RR submission.

4.7. Drilling Through the CO_2 Area

There is a risk, albeit small, that future drilling through the Burbank formation could occur and inadvertently create a leakage pathway. However, the risk is very low because of regulatory requirements, routine inspections, and operational drivers. EPA UIC regulations regarding Class II injection wells require that any fluids be contained in strata in which they are encountered.[28] In addition, Perdure's visual inspection process is designed to identify unapproved drilling activity in the NBU, especially where Perdure owns substantial portions of the surface estate. Finally, Perdure plans to conduct CO_2-EOR operations in the NBU for decades and inherently has a commercial interested in protecting the integrity of its assets and maximizing resources.

4.8. Diffuse Leakage Through the Seal

In the NBU, for CO_2 injected into the reservoir, the natural seal is the Pink Limestone member of the Cherokee formation. Diffuse leakage of the injected CO_2 through the seal is highly unlikely and improbable.

The seal is composed of several feet of salt, shale and tight carbonate. The seal is highly impermeable where unperforated, and the seal is cemented across in any horizons where the seal is perforated by wells. If CO_2 were to migrate through the seal, it would be encountered and trapped by the secondary seal which is the Oswego Limestone member of the Marmaton formation, or any of the additional shallower seals indicated in brown in Figure 4 (on page 6).

Oil and gas production in the NBU from the reservoir also confirms the successful trapping of fluids by the seal over geologic time. The natural seal is the reason the reservoir exists in the first place. Additional pressure monitoring and geo-mechanical modeling of the seal in the NBU also confirms the efficiency and integrity of the confining system.

In addition, each CO_2 injection well is assigned a maximum surface injection pressure by the EPA. This limitation is imposed as part of the EPA UIC permitting process and has the purpose of ensuring that the reservoir fracture pressure is not exceeded.

Additionally, geo-mechanical analyses were conducted using wireline logs and core tests for certain wells in the NBU. Analytical techniques were used to estimate changes in minimum horizontal stress, σh, caused by changes in pressure and temperature during CO_2 injection, and to determine whether the stress state compromises the ability of the reservoir for safe and effective CO_2 storage. It was found

[28] 40 CFR § 146.22(b)(1).

that fracturing of the reservoir or caprock is not likely, as long as the injection pressure is maintained below the EPA UIC permit pressure limit.

5. Monitoring

5.1. Monitoring Generally

As part of its ongoing operations, Perdure monitors and collects flow, pressure, temperature, and gas composition data from wells and facilities in the NBU, and stores that information in the company's data management system. Some information is collected electronically by equipment connected to a supervisory control and data acquisition (SCADA) system, while other information is collected manually by operations personnel physically present at the well or facility. Meters are used throughout the NBU for measurement purposes. However, accuracy of meters – even though installed, operated, maintained and calibrated according to industry standards – are inherently suspect due to variances between meters, such as factor settings, meter calibrations, operation conditions, elevation differences, changes in temperature during a day, pressure changes over short time periods, and fluid composition differences (especially in multi-component or multi-phase flows). The NBU includes 439 active completed injection and production wells, and a comparable number of meters, each with an acceptable range of error. This is a site-specific factor that is considered in the mass balance calculations described in Section 7.

Leakage detection for the NBU facilities includes visual inspection of wellheads and surface facilities, injection well monitoring, and Mechanical Integrity Tests (MIT). Some of the potential leakage pathways include surface equipment and wells. Detection monitoring program techniques include visual inspections, pipeline inspections, gas alarms, personal H_2S monitors, and MITs. Areas that are monitored for such leaks include the area from the injection flow meter to the injection wellhead, and from that wellhead to the injection formation. Detection of CO_2 from these potential leakage pathways are described in Section 5.2 through Section 5.5 below. While faults, fractures, formation seal and lateral migration could be additional leakage pathways, the likelihood of such leaks are highly improbable, as described in more detail in Sections 4.2, 4.6, and 4.8 above.

5.2. CO_2 Received

The amount of CO_2 received will be calculated using one or more custody-transfer meters at the point at which custody of the CO_2 is transferred to the NBU. Currently, the sole source of CO_2 received by the NBU is CO_2 from the Coffeyville CO_2 Pipeline. These custody transfers are commercial transactions that are documented. CO_2 composition is governed by the contract, and the CO_2 is periodically sampled to determine composition. Perdure uses flowmeters for measurements at custody transfer locations, and these flowmeters measure flow rate continually. Any additional CO_2 received into the NBU would be measured using similar flowmeters. No CO_2 is currently received in containers.

5.3. CO_2 Injected

The amount of injected CO_2 is calculated using the flow meter volumes at the operations meters at the outlet of the numerous compressors at the RCF, and each of the meters at each CO_2 off-take point from a CO_2 source (currently there is only one such off-take point, the Coffeyville CO_2 Pipeline).

5.4. CO_2 Produced, Entrained and Recycled

CO_2 produced is calculated using flowmeters at the production satellites and any flowmeters at the inlet of the RCF. For purposes of reporting under Subpart RR, Perdure will measure the mass of CO_2

produced through these volumetric flowmeters. For any new production facilities that may be added in the NBU (as indicated in Section 2.5.4), the mass of CO_2 produced would similarly be measured using one or more volumetric flowmeters.

CO_2 is produced as entrained (or dissolved) CO_2 in produced oil. As the oil passes through low-pressure separation to a gathering tank, a small amount of the CO_2 is released. The mass of this amount of CO_2 will be determined as described in Section 7.3 below.

Recycled CO_2 is calculated as CO_2 that is produced from the NBU, recaptured, and reinjected into the NBU. Recycled CO_2 is calculated using the flowmeters on the downstream side of the RCF.

5.5. CO_2 Emitted by Surface Leakage

Perdure uses an event-driven process to assess, address, track and (if applicable) quantify potential CO_2 leakage to the surface. The multi-layered, risk-based monitoring program for event-driven incidents has been designed to meet two objectives, in accordance with the leakage risk assessment in Section 4: (1) to detect problems before CO_2 leaks to the surface; and (2) to detect and quantify any leaks that do occur. Section 5.5.1 through Section 5.5.3 (below) discuss how this monitoring will be conducted and used to quantify the volumes of CO_2 leaked to the surface.

The emissions from the field associated with the NBU have historically not met or exceeded the Subpart W reporting threshold. Because Perdure believes this historical trend will continue, Perdure does not anticipate reporting under Subpart W for the field associated with the NBU. In the event emissions from the field associated with the NBU trigger a reporting requirement under Subpart W, Perdure will comply with Subpart W regulations. For purposes of this MRV Plan, certain Subpart W methodologies will be utilized for certain emission calculations regardless of whether Subpart W reporting is required by regulation. We call this the Subpart W Methodology Approach, which is referenced throughout this MRV Plan. Perdure will reconcile any results of the Subpart W Methodology Approach[29] and results from any event-driven quantification to assure that surface leaks are not counted multiple times.

5.5.1. Monitoring for Potential Leakage from the Injection/Production Zone

Perdure monitors both injection into, and production from, the reservoir as a means of early identification of potential anomalies that could indicate leakage of CO_2 from the subsurface. The following surface data is routinely tracked and reported on a daily basis: injection rate (barrels of water, MCF of CO_2), production rates (barrels of oil, barrels of water, MCF of CO_2), tubing pressure (psig), casing pressure (psig), wellhead temperature (°F), and runtime (hours). At certain locations, instruments exist that collect data more frequently, but most if not all of that information is reduced to daily totals or averages which is a standard and custom in the oil and gas industry. The collected information is used

[29] As part of the Subpart W Methodology Approach, certain monitoring and QA/QC procedures specified in Subpart W will be used to estimate surface leaks from equipment in the NBU. Subpart W uses a factor-driven approach to estimate equipment leakage. Perdure evaluates and estimates leaks from equipment, the CO_2 content of produced oil, and vented CO_2 – including for CO_2 emitted from equipment leaks and vented emissions of CO_2 from surface equipment located between (a) the injection flowmeter and the injection wellhead, and (b) the production flowmeter and the production wellhead. See Section 7.5 below.

primarily for operational oversight and monitoring of CO_2-EOR projects, but it is intended that this data also be used to determine when additional investigation is warranted of any potential CO_2 leakage.

Perdure uses reservoir modeling based on extensive history-matched data, as well as permit conditions and operational performance of CO_2-EOR operations by the prior operator and by Perdure, to develop daily and/or monthly injection rates, pressures, and volumes for each injection well. If injection pressure or rate measurements exceed specified set points determined as part of each pattern injection plan, then a flag is automatically generated, and operations personnel will investigate and resolve the matter. These anomalies are reviewed by operations personnel, and may include engineering personnel, to determine if CO_2 leakage is occurring. These kinds of anomalies are not necessarily indicators of leaks. Instead, they may simply indicate that injection rates and pressures are not conforming to the pattern injection plan. In many cases, flagged conditions present problems are straightforward to remedy, such as recalibration of a meter or some other minor action, and there is no threat of CO_2 leakage. If the issue is not readily resolved, a more detailed investigation is initiated, and additional Perdure personnel and perhaps industry support would provide additional assistance and evaluation. If a leak occurs, Perdure would quantify its magnitude.

In addition to developing daily and/or monthly injection plans, Perdure also uses collected data to forecast production volumes of oil, water and CO_2, both as to produced volumes and composition. Production wells are assigned to a satellite test facility and are isolated once every quarter for a daily well production test. Such tests are conducted more frequently if overall production or individual well pressure data call for it, or if fewer production wells are assigned to a particular satellite test facility. Production and test data is reviewed on a periodic basis. If there is a significant deviation from past performance or forecast, then operations and engineering personnel will investigate the matter further. If the cause of the deviation cannot be resolved or understood quickly, then a more thorough investigation would be initiated. If a leak to the surface occurs, Perdure would quantify its magnitude.

If leakage in the reservoir or flood zone were detected, Perdure would deploy methods to quantify the volume of CO_2 involved. One possible method could be the use of material balance equations based on known injected quantities, and monitored pressures in the reservoir, to estimate the magnitude of the CO_2 involved.

If there is a subsurface leak of CO_2, it might not lead to a surface leak of CO_2. In the event of a subsurface CO_2 leak, Perdure would select an appropriate approach for tracking subsurface leakage to determine and quantify CO_2 leakage to the surface. To quantify CO_2 leakage to the surface, an estimate of the relevant parameters would be deployed, including the rate, concentration, and duration of the leakage. Depending on specific circumstances, these determinations may rely on engineering estimates.

In the event leakage from the subsurface occurred diffusely through the seals up to the surface, then the leaked gas would include H_2S, which would trigger the alarm on the personal monitors worn by field personnel. In the event such a leak was detected, operations and engineering personnel would determine how to address the problem. The team might use modeling, engineering estimates and direct measurements to quantify the leakage and otherwise address the matter.

5.5.2. Monitoring of Wellbores

Perdure monitors wells through continual, automated pressure monitoring in the injection zone (as described in Section 4.1), monitoring of the annular pressure in wellheads, and routine maintenance and inspection. In the event a wellbore does not sufficiently satisfy a mechanical integrity test (MIT) then the wellbore is shut-in until a satisfactory repair in implemented such as a workover. When the repair is made, another MIT is performed and upon satisfying that test, operations on the wellbore are resumed upon receipt of any necessary regulatory approval to re-establish operations again.

Leaks from wellbores would be detected through the follow-up investigation of pressure anomalies, visual inspection, or the use of personal H_2S monitors.

Anomalies in injection zone pressure may not indicate a leak, as discussed in Section 5.5.1 above. However, if an investigation is initiated, Perdure personnel and perhaps industry support would inspect the equipment in question and determine the nature of the problem. If it is a simple matter, the repair would be accomplished, and the volume of leaked CO_2 would be included in the Subpart W Methodology Approach. If a more extensive repair is needed, then Perdure would determine the appropriate approach for quantifying leaked CO_2 using the relevant parameters (e.g., the rate, concentration, and duration of leakage).

Anomalies in annular pressure or other issues detected during routine maintenance inspections would be treated in a very similar manner. The equipment in question would be inspected for the purpose of determining the nature of the problem. For simple matters, the repair would be made at the time of inspection and the volume of leaked CO_2 would be included in the Subpart W Methodology Approach. If a more extensive repair is needed, then Perdure would determine the appropriate approach for quantifying leaked CO_2 using the relevant parameters (e.g., the rate, concentration, and duration of leakage). One approach that would be considered is to prorate the most recently daily volume of CO_2 involved, compared against the number of hours CO_2 leaked from the system.

Because leaking CO_2 at the surface is very cold and leads to formation of bright white clouds and ice that are easily spotted, Perdure also employs a visual inspection process in the general area of the NBU to detect unexpected releases from wellbores. One aspect of the visual inspection process is that operations personnel visit NBU surface facilities on a routine basis. Such inspections may include tank volumes, equipment status and reliability, lube oil levels, pressures and flow rates in the facility, valve leaks, checking that injectors are on the proper WAG schedule and observing the facility for visible CO_2 or fluid line leaks. In the event a repair is necessary, the time to repair any leak is dependent on several factors, such as the severity of the leak, available manpower, location of the leak, and availability of materials required for the repair. Critical leaks are acted upon immediately.

In addition, Perdure uses data collected by H_2S monitors which are worn by all field personnel as a last method to detect leakage from wellbores. The H_2S monitors' detection limit is 10 ppm. If an H_2S alarm is triggered, the first response is to protect the safety of the personnel, and the next step is to safely investigate the source of the alarm. As noted previously, Perdure considers H_2S as a proxy for potential CO_2 leaks in the field. As a result, detected H_2S leaks will be investigated to determine and, if needed, quantify potential CO_2 leakage.

5.5.3. Other Potential Leakage at the Surface

Perdure will utilize the same visual inspection process and H_2S monitoring system to detect other potential leakage at the surface as it does for leakage from wellbores. Perdure utilizes routine visual inspections to detect significant loss of CO_2 to the surface. Operations personnel routinely visit surface facilities to conduct a visual inspection. Inspections may include review of tank levels, equipment status, lube oil levels, pressures and flow rates in the facility, valve leaks, ensuring that injectors are on the proper WAG schedule, and conducting a general observation of the facility for visible CO_2 or fluid line leaks. If a problem is detected, operations personnel would investigate and, if maintenance is required, perform the maintenance or supervise a work crew to perform the maintenance. In addition to the visual inspections, the results of the personal H_2S monitors worn by operations personnel will be a supplement for smaller leaks that may escape visual detection. If CO_2 leakage to the surface is detected, it will be reported to an operations personnel supervisor who will review the report and conduct a site investigation. If maintenance is required, operations personnel will perform the maintenance or supervise a work crew to perform the maintenance. The amount of any CO_2 leakage would be quantified.

5.6. Metering

Perdure follows industry standard metering protocols for custody transfers, such as those standards for accuracy and calibration issued by the API, the American Gas Association (AGA), and the Gas Processors Association (GPA), as appropriate. This approach is consistent with Section 98.444(e)(3). These meters are maintained routinely, operated continually, and will feed data directly to the centralized data collection systems. CO_2 composition is governed by contract and the CO_2 is routinely and periodically sampled to determine average composition. These custody meters provide an accurate method of measuring mass flow.

In addition to custody transfer meters, various process control meters are used in the NBU to monitor and manage in-field activities, many times on a real-time basis. These operations meters provide information used to make operational decisions but are not intended to provide the same level of accuracy as the custody-transfer meters. The level of precision and accuracy for operational meters currently satisfies the requirements for reporting in existing UIC permits. Although these meters are accurate for operational purposes, it is important to note that there is some variance between most commercial meters (on the order of 1-5%) which is additive across meters. This variance is due to differences in factory settings and meter calibration, as well as the operating conditions within the NBU or any given field. Meter elevation, changes in temperature (over the course of the day), fluid composition (especially in multi-component or multi-phase streams), and pressure can affect readings of these operational meters. Unlike some CO_2 injection operations where there are likely to be only a few injection wells and associated meters, the CO_2-EOR operations in the NBU as of January 2020 involves 451 active completed wells and a comparable number of meters, each with an acceptable range of error. This is a site-specific factor that is considered in the mass balance calculations described in Section 7.

5.7. Leakage Verification

If there is a report or indication of a CO_2 leak, such as from a visual inspection, monitor, or pressure drop, a Perdure employee or supervisor will be dispatched to investigate the leak. Emergency shutdown systems will be utilized as necessary to isolate the leak. If the leak cannot be located without movement of equipment or other substantial work, further involvement of Perdure personnel or management will be involved to make a determination regarding how the leak will be located. Once the leak is located and isolated, pressure from the system will be relieved so that further investigation of the leak area can be performed, and repair work can be estimated and ultimately performed.

5.8. Leakage Quantification

Leakage of CO_2 on the surface will be estimated once leakage has been detected and confirmed. Leakage quantification will consist of a methodology selected by Perdure. Leakage estimating methods may potentially consist of modeling or engineering estimates based on operating conditions at the time of the leak, such as temperatures, pressures, volumes and hole size.

5.9. Demonstration at End of Specified Period

At the end of the Specified Period, Perdure intends to cease injecting CO_2 for the subsidiary or ancillary purpose of establishing the long-term storage of CO_2 in the NBU. After the end of the Specified Period, Perdure anticipates that it will submit a request to discontinue monitoring and reporting. The request will demonstrate that the amount of CO_2 reported under Subpart RR "is not expected to migrate in the future in a manner likely to result in surface leakage".[30]

At that time, Perdure will be able to support its request with years of data collected during the Specified Period as well as one to three (or more, if needed) years of data collected after the end of the Specified Period. This demonstration will provide the information necessary for the EPA Administrator to approve the request to discontinue monitoring and reporting. This demonstration may include, but is not limited to:

1) An assessment of CO_2 injection data for the NBU, including the total volume of CO_2 injected and stored as well as actual surface injection pressures;
2) An assessment of any CO_2 leakage detected, including discussion of the estimated amount of CO_2 leaked and the distribution of emissions by leakage pathway; and
3) An assessment of reservoir pressure in the NBU that demonstrates that the reservoir pressure is stable enough to demonstrate that the injected CO_2 is not expected to migrate in a manner to create a potential leakage pathway.

6. Determination of Baselines for Monitoring CO_2 Surface Leakage

Perdure intends to use the results of daily monitoring of field conditions, operational data (including automatic data systems), routine testing, and maintenance information to identify and investigate excursions from expected performance that could indicate CO_2 leakage, and to otherwise monitor for surface leakage. In the event any of those results identify an issue where a CO_2 leak has occurred, the event will be documented, and an estimate will be made of the amount of CO_2 leaked. The event and estimate will be included in the annual RR reporting. Records of each event will be kept on file for a minimum of 3 years. The methods that Perdure intends to use include the following:

6.1. Data System.

Perdure uses onsite management and SCADA data to conduct its CO_2-EOR operations. Perdure uses data from these efforts to identify and investigate variances from expected performance that could indicate CO_2 leakage. Some CO_2 meters are installed with SCADA systems, that transmit data from the meters automatically into a data warehouse. That data, as well as other operational data collected manually, is also used for operational management and controls.

6.2. Visual Inspections.

Perdure's field personnel conduct routine weekly if not daily inspections of the NBU facilities, wells and other equipment (such as vessels, piping, and valves). These visual inspections provide an opportunity to identify issues early and to address them proactively, which may preclude leaks from happening

[30] Section 98.441.

and/or minimize any CO_2 leakage. Any visual identification of CO_2 vapor emission or ice formation will be reported and documented, and a plan will be developed and executed to correct the issue.

6.3. Personal H_2S Monitors.

All field personnel are required to wear H_2S monitors which, when alarmed at 10 ppm, trigger an immediate response to make sure that personnel are not at risk (and to verify that the monitor is working properly). Any alarm of an H_2S monitor will indicate a release of CO_2, which will be reported and documented, and a plan will be developed and executed to correct the issue.

6.4. Injection Target Rates and Pressures.

Perdure manages its CO_2-EOR operations by developing and implementing target injection rates and pressures for each CO_2 injection well. These target rates and pressures are developed based on various parameters such as historic and ongoing pattern development, WAG operations, CO_2 availability, field performance, and permit conditions. Field personnel implement the WAG schedule by manually making choke adjustments at each injection well, allowing for a physical inspection as described in Section 6.2 of the injection well during each adjustment. Typically on a daily basis, injection rates for each CO_2 injection well are reported and compared to the target rates. Injection pressures and casing pressures are monitored using SCADA equipment on each CO_2 injection well. Injection rates or pressures falling outside of the target rates or pressures to a statistically significant degree are screened to determine if they could lead to CO_2 leakage to the surface. If that screening or investigation identifies any indication of a CO_2 leakage to the surface in this manner, it will be reported and documented, and a plan will be developed and executed to correct the issue.

6.5. Production Wells.

Perdure forecasts the amount of fluids (e.g. oil, water, CO_2) that is likely to be produced from each production well in the NBU over various periods of time. Evaluation of these produced volumes, along with other data, informs operational decisions regarding management of the CO_2-EOR project, and aid in identifying possible issues that may involve CO_2 leakage. These evaluations can direct engineering and/or operational personnel to investigate matters further. If that investigation identifies that a CO_2 leak has occurred, it will be reported and documented, and a plan will be developed and executed to correct the issue.

6.6. Continuous Plant and Pipeline Monitoring.

Perdure currently owns and operates the sole CO_2 supply for the NBU, including the associated CO_2 capture, compression and dehydration facility and the CO_2 pipeline. The facility includes a monitoring program that monitors the rates and pressures at the facility and on the pipeline on a continuous basis. High and low set points are established in the program, and operators at the plant, pipeline and/or NBU are alerted if a parameter is outside the allowable window. If the flagged parameter is the delivery point on the pipeline, but no other parameter at the plant or pipeline is flagged, then the NBU field personnel are alerted so that further investigation can be conducted in the field to determine if the issue poses a leak threat.

6.7. Well Testing.

On a periodic (and in many instances an annual) basis, the NBU injection wells are leak tested for Mechanical Integrity Testing (MIT) as required by the EPA. This consists of regular monitoring of the tubing-casing annular pressure, and conducting a test that pressures up the well and wellhead to verify the well and wellhead can hold the appropriate amount of pressure. Perdure personnel monitor the pressure, and conduct the tests, in accordance with regulations and permit requirements. In the event of a loss of mechanical integrity, the subject injection well is immediately shut-in and an investigation is initiated to determine what caused the loss of mechanical integrity. If investigation of an event identifies that a CO_2 leak has occurred, it will be reported and documented, and a plan will be developed and executed to correct the issue.

7. Determination of CO_2 Volumes Stored Using Mass Balance Equations

The locations for obtaining volume data for the equations in Section 98.443 are proposed to be modified. The following subsections describe how Perdure will calculate the mass of CO_2 injected, emitted, and stored in the NBU.

7.1. Mass of CO_2 Received

Equation RR-2 will be used to calculate the mass of CO_2 received from each delivery point at the NBU ("Mass of CO_2 Received"). The volumetric flow at standard conditions will be multiplied by the CO_2 concentration and the density of the CO_2 at standard conditions to determine mass.

$$\mathrm{CO}_{2T,r} = \sum_{p=1}^{4} \left(Q_{r,p} - S_{r,p} \right) * D * C_{CO_2,p,r} \qquad \text{(Equation RR} - 2)$$

where:

$CO_{2T,r}$ = Net annual mass of CO_2 received through flow meter r (metric tons)

$Q_{r,p}$ = Quarterly volumetric flow through a receiving flow meter r in quarter p at standard conditions (standard cubic meters)

$S_{r,p}$ = Quarterly volumetric flow through a receiving flow meter r that is redelivered to another facility without being injected into a NBU well in quarter *p* (standard cubic meters)

D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682

$C_{CO_2,p,r}$ = Quarterly CO_2 concentration measurement in flow for flow meter r in quarter p (vol. percent CO_2, expressed as a decimal fraction)

p = Quarter of the year

r = Receiving flow meter(s)

All delivery of CO_2 to the NBU is currently used within the NBU and not redelivered outside of the NBU, so quarterly flow redelivered, $S_{r,p}$, will be reported as zero ("0") during the time period of that operation. Quarterly CO_2 concentration measurement, $C_{CO_2,p,r}$, will be taken.

Equation RR-3 will be used to sum to total Mass of CO_2 Received.

$$CO_{2,RE} = \sum_{r=1}^{R} CO_{2T,r} \qquad \text{(Equation RR} - 3\text{)}$$

where:

$CO_{2,RE}$ = Total net annual mass of CO_2 received (metric tons)

$CO_{2T,r}$ = Net annual mass of CO_2 received (metric tons) as calculated in Equation RR-2 for flow meter r

r = Receiving flow meter(s)

7.2. Mass of CO_2 Injected into the Subsurface

The Mass of CO_2 Injected into the Subsurface in the NBU will be determined by Equation RR-6 as modified to be the sum of (1) the Mass of CO_2 Recycled as described below and (2) the Mass of CO_2 Received as determined in Section 7.1 above.

Equation RR-5 will be used to calculate the Mass of CO_2 Recycled using measurements taken from the volumetric flow meter(s) located on the downstream side of the RCF. Using data from these meters will be more accurate than using data at each injection well, because the latter would give an inaccurate estimate of total injection volume due to the large number of injection wells and the potential for propagation of error due to allowable calibration ranges for each meter. The Mass of CO_2 Recycled is determined as follows:

$$CO_{2,u} = \sum_{p=1}^{4} Q_{p,u} * D * C_{CO_2,p,r} \qquad \text{(Equation RR} - 5\text{)}$$

where:

$CO_{2,u}$ = Annual CO_2 mass injected as measured by flow meter(s) u (metric tons)

$Q_{p,u}$ = Quarterly volumetric flow rate measurement for flow meter(s) u in quarter p at standard conditions (standard cubic meters per quarter)

D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682

$C_{CO_2,p,u}$ = CO_2 concentration measurement in flow for flow meter(s) u in quarter p (vol. percent CO_2, expressed as a decimal fraction)

p = Quarter of the year

u = Flow meter(s)

The Mass of CO_2 Injected is the sum of (1) the Mass of CO_2 Recycled (Equation RR-5 above) and (2) the Mass of CO_2 Received (described in Section 7.1 above):

$$CO_{2,I} = CO_{2,u} + CO_2 \qquad \text{(Equation RR} - 6\text{)}$$

where:

$CO_{2,I}$ = Annual CO_2 Mass Injected (metric tons)

$CO_{2,u}$ = Annual CO_2 mass injected as measured by flow meter u (metric tons)

CO_2 = Total net annual mass of CO_2 received (metric tons)

7.3. Mass of CO_2 Produced

The Mass of CO_2 Produced in the NBU will be determined by using measurements from (1) the flow meters at the production satellites and any meters at the inlet to the RCF and (2) the custody transfer meters for oil sales. As with injection well data, using the data at each production well would give an inaccurate estimate of the total mass of CO_2 produced due to the large number of wells and the potential for propagation of error due to allowable calibration ranges for each meter.

Equation RR-8 (as modified) will be used to calculate the mass of CO_2 produced from the production wells (other than the mass of CO_2 entrained in produced oil).

$$\mathrm{CO}_{2,w} = \sum_{p=1}^{4} Q_{p,w} * D * C_{CO_2,p,w} \qquad \text{(Equation RR} - 8\text{)}$$

where:

$CO_{2,w}$ = Annual CO_2 mass produced through meter(s) w (metric tons)

$Q_{p,w}$ = Volumetric gas flow rate measurement for meter(s) w in quarter p at standard conditions (standard cubic meters)

D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682

$C_{CO_2,p,w}$ = CO_2 concentration measurement in flow for meter(s) w in quarter p (vol. percent CO_2, expressed as a decimal fraction)

p = Quarter of the year

w = Flow meters

Equation RR-9 (as modified) is used to aggregate (1) the flow meters at the production satellites or any meters at the inlet to the RCF and (2) the custody transfer meters for oil sales.

$$\mathrm{CO_{2,P}} = \sum_{w=1}^{W} CO_{2,w} + X_{oil} \qquad \text{(Equation RR} - 9)$$

where:

$CO_{2,P}$ = Total annual CO_2 mass produced through all meters in the reporting year (metric tons)

$CO_{2,w}$ = Annual CO_2 mass produced through meters w in the reporting year (metric tons)

X_{oil} = Mass of entrained CO_2 in oil in the reporting year, measured utilizing commercial meters and electronic flow measurement devices at each point of custody transfer, with such mass of CO_2 calculated by multiplying the total volumetric rate by the CO_2 concentration

w = Flow meters

7.4. Mass of CO_2 Emitted by Surface Leakage

The total annual Mass of CO_2 Emitted by Surface Leakage will be calculated and reported using an approach that is tailored to specific leakage events. Potential leakage events in a variety of settings are identified in other portions of this plan. Estimates of the mass of CO_2 Emitted by Surface Leakage will likely depend on a number of site-specific factors, including measurements, engineering estimates, emission factors, source of the leakage, nature of the leakage, and other factors. The process for quantifying leakage will entail using state of the art engineering principles or emission factors or both. It is not possible to predict in advance the types of leaks that may or will occur. However, some approaches to quantification are described in Section 5.1 above. In the event of a Surface Leakage, the mass of CO_2 Emitted would be quantified and reported, and the records would be maintained that describe the methods used to estimate or measure the Mass of CO_2 Emitted by Surface Leakage. In addition, information from the Subpart W Methodology Approach will be taken into consideration, and will be reconciled to ensure that surface leakage of CO_2 emissions is not double counted. Equation RR-10 will be used to calculate the Mass of CO_2 Emitted by Surface Leakage:

$$\mathrm{CO_{2,E}} = \sum_{x=1}^{X} CO_{2,x} \qquad \text{(Equation RR} - 10)$$

where:

$CO_{2,E}$ = Total annual CO_2 mass emitted by surface leakage in the reporting year (metric tons)

$CO_{2,x}$ = Annual CO_2 mass emitted at leakage pathway x in the reporting year (metric tons)

x = Leakage pathway

7.5. Mass of CO_2 Sequestered

Equation RR-11 is used to calculate the Mass of CO_2 Sequestered in subsurface geologic formations in the reporting year.

$$\mathrm{CO_2} = CO_{2,I} - CO_{2,P} - CO_{2,E} - CO_{2,FI} - CO_{2,FP} \quad (\text{Equation RR} - 11)$$

where:

- CO_2 = Total annual CO_2 Mass Sequestered in subsurface geologic formations at the facility in the reporting year (metric tons)
- $CO_{2,I}$ = Total annual CO_2 Mass Injected in the well or group of wells covered by this source category in the reporting year (metric tons)
- $CO_{2,P}$ = Total annual CO_2 Mass Produced net of CO_2 entrained in oil in the reporting year (metric tons)
- $CO_{2,E}$ = Total annual CO_2 Mass Emitted by surface leakage in the reporting year (metric tons)
- $CO_{2,FI}$ = Total annual CO_2 Mass Emitted from equipment leaks and vented emissions of CO_2 from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead, for which a calculation procedure is provided in GHGRP Subpart W (metric tons)
- $CO_{2,FP}$ = Total annual CO_2 Mass Emitted from equipment leaks and vented emissions of CO_2 from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity, for which a calculation procedure is provided in GHGRP Subpart W (metric tons)

7.6. Cumulative Mass of CO_2 Reported as Sequestered

The total annual CO_2 Mass Sequestered in subsurface geologic formations at the facility in the reporting year, using Equation RR-11, will be summed to calculate the Cumulative Mass of CO_2 Sequestered in subsurface geologic formations.

8. Estimated Schedule for Implementation of MRV Plan

This plan will be effective as of January 1, 2020, which is also the proposed date for beginning to collect data under this plan. Other GHG reports are filed on March 31 of the year after the reporting year and it is anticipated that the Annual Subpart RR Report will be filed at the same time. As described in Section 3.3 above, it is anticipated that the MRV program will be in effect during the Specified Period, during which time the NBU will be operated with the subsidiary or ancillary purpose of establishing long-term containment of a measurable quantity of CO_2 in the reservoir at the NBU. It is anticipated that Perdure will establish that a measurable amount of CO_2 injected during the Specified Period will be stored in a manner not expected to migrate in the future in a manner likely to result in surface leakage. At such time, a demonstration will be prepared that will supporting the long-term containment determination, and a request will be submitted to discontinue reporting under this MRV plan.
See Section 98.441(b)(2)(ii).

9. Quality Assurance Program

9.1. Monitoring

The requirements of Sections 98.444(a) – (d) are incorporated into the mass balance calculations in Section 7 above. These include the following:

CO_2 Received and Injected

- The quarterly flow rate of CO_2 received by pipeline is measured with volumetric flow meter(s) at the receiving custody transfer point(s).
- The quarterly CO_2 flow rate for recycled CO_2 is measured with volumetric flow meter(s) at the outlet of the RCF.

CO_2 Produced

- The point of measurement for the quantity of CO_2 produced from oil or other fluid production wells is a volumetric flow meter directly downstream of separation, sending a stream of gas into a recycle system or end use system.
- The produced gas stream is sampled at least once per quarter immediately downstream of the flow meter used to measure flow rate of that gas stream, and the CO_2 concentration of the sample is measured.
- The quarterly flow rate of the produced gas is measured with volumetric flow meter(s) located at the inlet of the RCF.

CO_2 emissions from equipment leaks and vented emissions of CO_2

- These volumes are measured in conformance with the monitoring and QA/QC requirements specified in Subpart W.

Flow meter provisions

The volumetric flow meters used to generate data for the mass balance equations in Section 7 are:

- Operated continuously except as necessary for maintenance and calibration.
- Operated using the calibration and accuracy requirements in Section 98.3(i).
- Operated in conformance with American Petroleum Institute (API) standards.
- National Institute of Standards and Technology (NIST) traceable.

Concentration of CO_2

- As required by Section 98.444(f)(1) and as indicated in Section 12.1, CO_2 concentration is measured using an appropriate standard method. Unless stated otherwise in the annual report, the standard method will be the use of a gas analyzer, which is an industry standard practice.
- As required by Section 98.444(f)(2), all measured volumes of CO_2 for Equations RR-2, RR-5 and RR-8 in Section 7 will be converted to standard cubic meters at a temperature of 60 degrees Fahrenheit and at an absolute pressure of 1 atmosphere.

9.2. Procedures for Estimating Missing Data

In the event any of the data needed for the mass balance calculations in Section 7 is unable to be collected, then the procedures for estimating missing data in §98.445 will be used. Those procedures include the following:

- A quarterly flow rate of CO_2 received that is missing would be estimated using invoices, purchase statements, or using a representative flow rate value from the nearest previous time period.
- A quarterly CO_2 concentration of a CO_2 stream received that is missing would be estimated using invoices, purchase statements, or using a representative concentration value from the nearest previous time period.
- A quarterly quantity of CO_2 injected that is missing would be estimated using a representative quantity of CO_2 injected from the nearest previous period of time at a similar injection pressure.
- For any values associated with CO_2 emissions from equipment leaks and vented emissions of CO_2 from surface equipment at the facility that are reported in Subpart RR, missing data estimation procedures specified in Subpart W would be followed.
- The quarterly quantity of CO_2 produced from subsurface geologic formations that is missing would be estimated using a representative quantity of CO_2 produced from the nearest previous period of time.
- When estimating the amount of CO_2 (due to an interruption in data collection, mechanical failure of a meter, mechanical failure of other equipment, or otherwise), the amount of CO_2 is to be estimated by using the most recent periodic (i.e. daily) volume of CO_2 associated with the meter or equipment and calculating the proportionate volume of "missing" CO_2 based on the number of hours involved in the data gap or until meter/equipment repair.

10. MRV Plan Revisions

In the event there is a material change to the monitoring and/or operational parameters of CO_2-EOR operations in the NBU that is not anticipated in this MRV plan, or if Perdure chooses to revise the MRV plan for any other reason, the MRV plan will be revised and submitted to the EPA Administrator within 180 days as required in Section 98.448(d). The proposed revision to this MRV plan will be submitted in the same manner and format as this MRV plan.

11. Records Retention

Records will be maintained as required under Section 98.3(g) and Section 98.447(a)(1) – (6). These records may be maintained electronically, in paper copies, or both. Data will be collected from these records and aggregated as required for reporting purposes.

12. Appendices

12.1. Conversion Factors

For purposes of this MRV Plan, CO_2 volumes are stated at Oklahoma standard conditions of temperature and pressure: 60°F and 14.65 psia.[31]

To convert these volumes into metric tons (tonnes), a density is calculated using the Span and Wagner equation of state as recommended by the EPA.[32] Density is calculated using the database of thermodynamic properties developed by the National Institute of Standards and Technology (NIST), available at http://webbook.nist.gov/chemistry/fluid/.

At State of Oklahoma standard conditions, the Span and Wagner equation of state gives a density of 0.0026417 lb-moles per cubic foot. Using a molecular weight for CO_2 of 44.00950, 2204.623 lbs/metric ton and 35.314667 ft^3/m^3, gives a CO_2 density of 5.2734289×10^{-2} MT/MCF or 0.001862294 MT/m^3.

The conversion factor 5.2734289×10^{-2} MT/MCF has been used throughout to convert CO_2 volumes to metric tons.

12.2. Acronyms

AGA – American Gas Association
AMA – Active Monitoring Area
AOR – Area of Review
API – American Petroleum Institute
BIA – US Bureau of Indian Affairs
BCF – billion cubic feet
cf – cubic feet
CO_2 – Carbon Dioxide
DOE – US Department of Energy
EOR – Enhanced Oil Recovery
EPA – US Environmental Protection Agency
GPA – Gas Processors Association
GHGRP – Greenhouse Gas Reporting Program
H_2S – Hydrogen Sulfide
LACT – Lease Automatic Custody Transfer
MIT – Mechanical Integrity Test
MMA – Maximum Monitoring Area
MCF – Thousand cubic feet
MMCF – Million cubic feet
MMP – Minimum Miscibility Pressure
MMT – Million metric tonnes
MRV – Monitoring, Reporting, and Verification
MMSTBO – Million stock tank barrels of oil
MT – Metric Ton (Tonne)

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[31] 52 Okla. Stat. § 52-472.

[32] General Technical Support Document for Injection and Geologic Sequestration of Carbon Dioxide: Subparts RR and UU, EPA Greenhouse Gas Reporting Program, Office of Air and Radiation, November 2010, pg 25.

NIST – National Institute of Standards and Technology
NBU – North Burbank Unit
NGL – Natural Gas Liquid
OOIP – Original Oil-In-Place
PPM – Parts Per Million
PSIG – Pound per Square Inch, Gauge
RCF – NBU CO_2 Recycling and Compression Facility
SCADA – Supervisory Control And Data Acquisition
STB – Stock Tank Barrel
UIC – Underground Injection Control
VRU – Vapor Recovery Unit
WAG – Water Alternating Gas
WCI – Water Curtain Injection

12.3. Glossary of Terms

This glossary describes some of the technical terms as they are used in this MRV plan.[33]

Contain / Containment – having the effect of keeping fluids located within in a specified portion of a geologic formation.

Dip -- Very few, if any, geologic features are perfectly horizontal. They are almost always tilted. The direction of tilt is called "dip." Dip is the angle of steepest descent measured from the horizontal plane. Moving higher up structure is moving "updip." Moving lower is "downdip." Perpendicular to dip is "strike." Moving perpendicular along a constant depth is moving along strike.

Formation -- A body of rock that is sufficiently distinctive and continuous that it can be mapped.

Permeability -- Permeability is the measure of a rock's ability to transmit fluids. Rocks that transmit fluids readily, such as sandstones, are described as permeable and tend to have many large, well-connected pores. Impermeable formations, such as shales and siltstones, tend to be finer grained or of a mixed grain size, with smaller, fewer, or less interconnected pores.

Phase -- Phase is a region of space throughout which all physical properties of a material are essentially uniform. Fluids that don't mix together segregate themselves into phases. Oil, for example, does not mix with water and forms a separate phase.

Porosity -- Porosity is the fraction of a rock that is not occupied by solid grains or minerals. Almost all rocks have spaces between rock crystals or grains that is available to be filled with a fluid, such as water, oil or gas. This space is called "pore space."

Primary recovery -- The first stage of hydrocarbon production, in which natural reservoir energy, such as gas drive, water drive or gravity drainage, displaces hydrocarbons from the reservoir, into the wellbore and up to surface. Initially, the reservoir pressure is considerably higher than the bottom hole pressure inside the wellbore. This high natural differential pressure drives hydrocarbons toward the well and up to surface. However, as the reservoir pressure declines because of production, so does the differential pressure. To reduce the bottom hole pressure or increase the differential pressure to increase

[33] For additional glossaries please see the U.S. EPA Glossary of UIC Terms (http://water.epa.gov/type/groundwater/uic/glossary.cfm) and the Schlumberger Oilfield Glossary (http://www.glossary.oilfield.slb.com/).

hydrocarbon production, it is necessary to implement an artificial lift system, such as a rod pump, an electrical submersible pump or a gas-lift installation. Production using artificial lift is considered primary recovery. The primary recovery stage reaches its limit either when the reservoir pressure is so low that the production rates are not economical, or when the proportions of gas or water in the production stream are too high. During primary recovery, only a small percentage of the initial hydrocarbons in place are produced, typically around 10% for oil reservoirs. Primary recovery is also called primary production.

Saturation -- The fraction of pore space occupied by a given fluid. Oil saturation, for example, is the fraction of pore space occupied by oil.

Seal – A geologic layer (or multiple layers) of impermeable rock that serve as a barrier to prevent fluids from moving upwards to the surface.

Secondary recovery -- The second stage of hydrocarbon production during which an external fluid such as water or gas is injected into the reservoir through injection wells located in rock that has fluid communication with production wells. The purpose of secondary recovery is to maintain reservoir pressure and to displace hydrocarbons toward the wellbore. The most common secondary recovery techniques are gas injection and waterflooding.

Stratigraphic section -- A stratigraphic section is a sequence of layers of rocks in the order they were deposited.

12.4. Oklahoma Earthquake History Maps

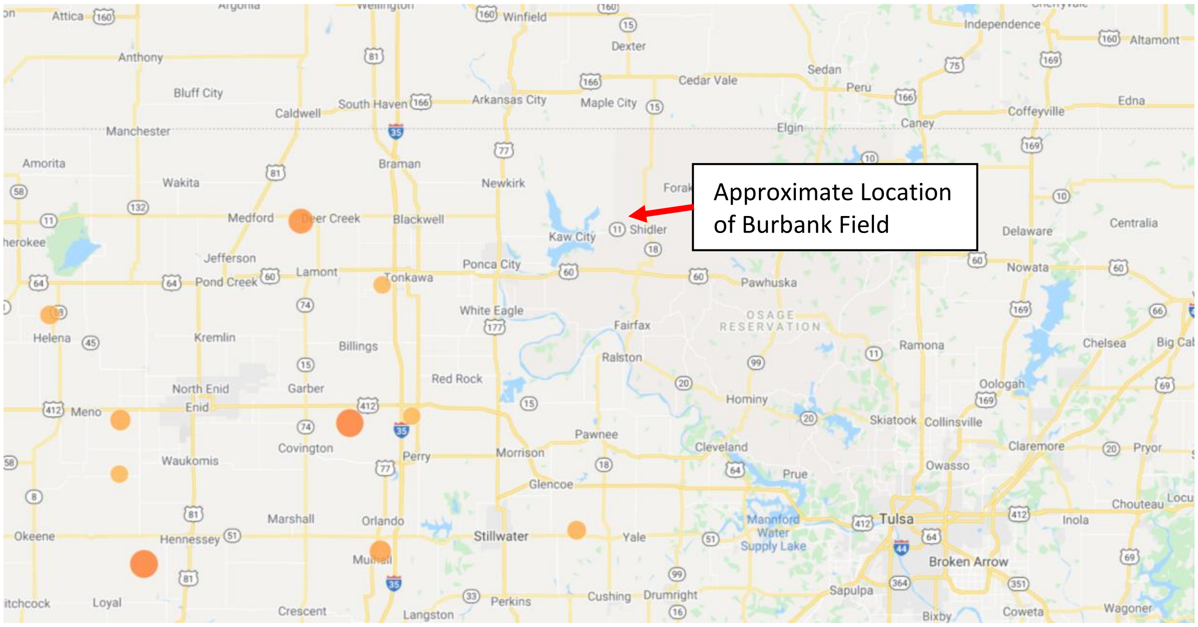

Figure 14 – Oklahoma Earthquake Densities: 1980-2012[34]

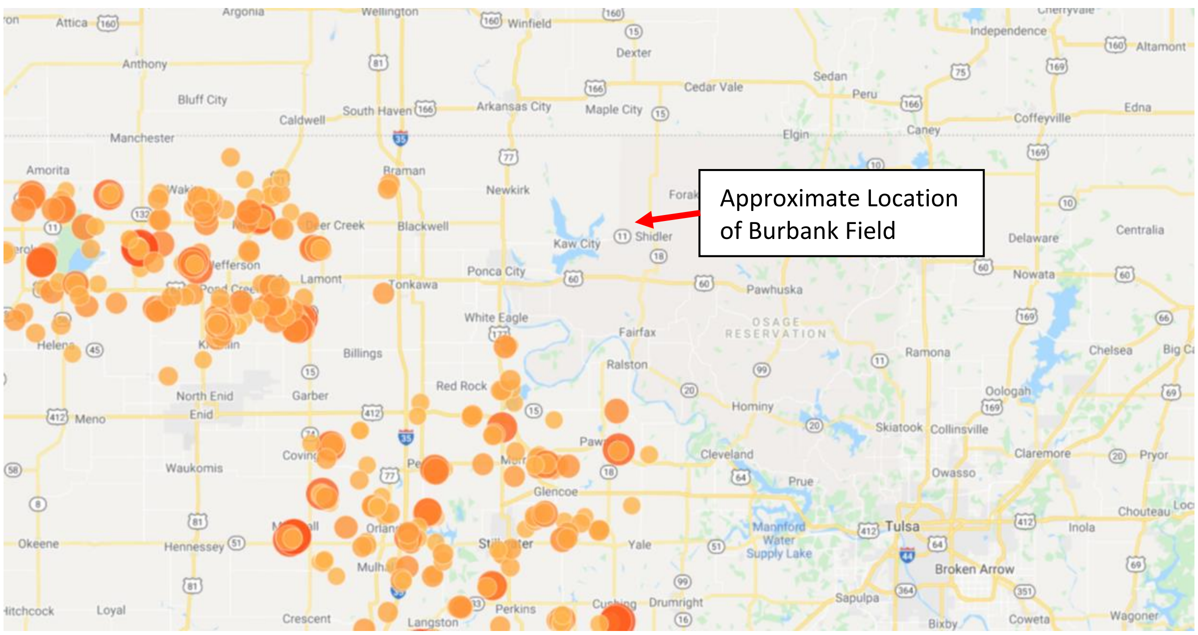

Figure 15 – Oklahoma Earthquake Densities: 2013-2014[35]

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[34] http://earthquakes.ok.gov/what-we-know/earthquake-map/
[35] http://earthquakes.ok.gov/what-we-know/earthquake-map/

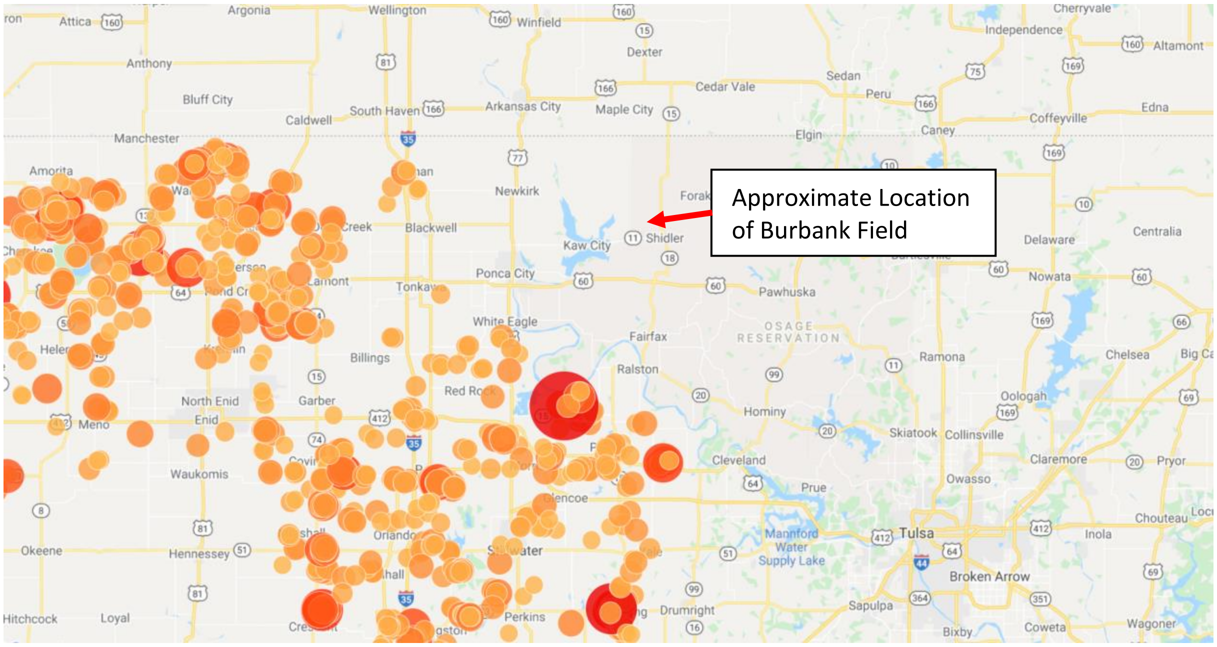

Figure 16 – Oklahoma Earthquake Densities: 2015-2016[36]

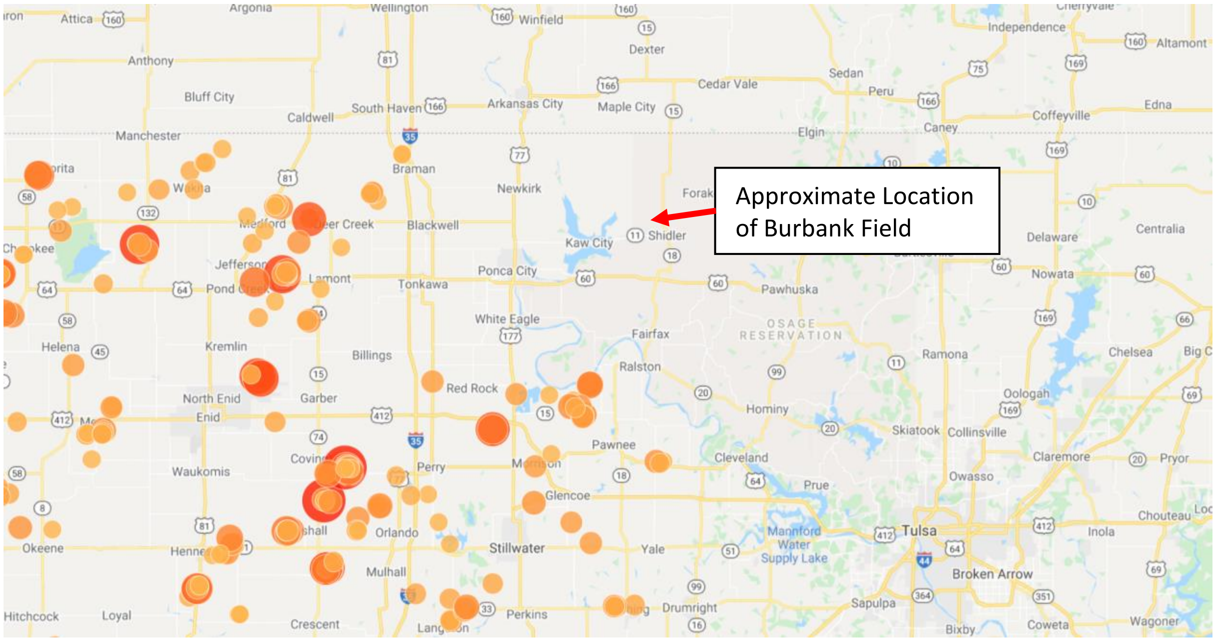

Figure 17 – Oklahoma Earthquake Densities: 2017-2018[37]

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36 http://earthquakes.ok.gov/what-we-know/earthquake-map/
37 http://earthquakes.ok.gov/what-we-know/earthquake-map/

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12.6. Reservoir-Related Publications

The NBU has been the subject of over 60 published reports, studies and articles, and the reservoir has been the object of numerous laboratory investigations and field tests of tertiary recovery. Some of the published papers, reports and other documents are listed in the References in Section 12.5 above, while many more are listed below.

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12.7. Wells

The following table presents the well name, API number, status and type for the wells in the NBU as of January 2020. The table is subject to change over time as new wells are drilled, existing wells change status, or existing wells are repurposed. The following terms are used:

- DRY refers to wells that were not produced and have been closed (plugged and abandoned)
- OIL refers to active wells that produce oil
- PA_GAS refers to gas production wells that have been closed (plugged and abandoned)
- PA_PROD refers to oil production wells that have been closed (plugged and abandoned)
- P&A_INJ refers to injection wells that have been closed (plugged and abandoned)
- P&A_UNKW refers to wells with an unknown type that have been closed (plugged and abandoned)
- SI_OIL refers to oil production wells that have been temporarily idled or shut-in
- SI_SWD refers to salt-water disposal wells that have been temporarily idled or shut-in
- SI_WINJ refers to water injection wells that have been temporarily idled or shut-in
- SI_WSW refers to water supply wells that have been temporarily idled or shut-in
- SI_WTR_SRVC refers to water service wells that have been temporarily idled or shut-in
- SWD refers to active salt-water disposal wells
- TA_INJ refers to water and CO_2 injection wells that have been temporarily abandoned
- TA_OIL refers to oil production wells that have been temporarily abandoned
- UNKNW refers to wells with an unknown status and type
- W_INJ refers to active wells that inject water
- WAG refers to active wells that inject water and CO_2
- WAG_TBD refers to wells anticipated to be drilled that inject water and CO_2

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-110-88510	4302A	SI_OIL	35-113-05572	13508W	P&A_INJ
35-113-05487	13001	SI_OIL	35-113-05573	13512	SI_OIL
35-113-05488	13002W	P&A_INJ	35-113-05574	13516W	P&A_INJ
35-113-05489	13003	OIL	35-113-05685	14002W	P&A_INJ
35-113-05490	13004W	P&A_INJ	35-113-05687	14006	OIL
35-113-05491	13005	P&A_INJ	35-113-05688	14007	SI_OIL
35-113-05493	13007	PA_PROD	35-113-06433	964	SI_WINJ
35-113-05494	13008W	P&A_INJ	35-113-07263	9303	PA_PROD
35-113-05495	13009	PA_PROD	35-113-07266	9302	PA_PROD
35-113-05496	13010W	PA_PROD	35-113-07269	9308	SI_OIL
35-113-05497	13011	PA_PROD	35-113-07271	9310	PA_PROD
35-113-05498	13012	PA_PROD	35-113-07272	9311	P&A_INJ
35-113-05499	13013	PA_PROD	35-113-07274	9313	PA_PROD
35-113-05500	13014W	PA_PROD	35-113-07275	9314	P&A_INJ
35-113-05501	13015	PA_PROD	35-113-07276	9315	P&A_INJ
35-113-05502	13016W	P&A_INJ	35-113-07277	9316	PA_PROD
35-113-05503	13007A	PA_PROD	35-113-07279	932	PA_GAS
35-113-05504	13017W	PA_PROD	35-113-07281	934	PA_PROD
35-113-05506	13305	SI_OIL	35-113-07282	9217	SI_OIL
35-113-05507	13306W	P&A_INJ	35-113-07283	9317	P&A_INJ
35-113-05508	13307	P&A_INJ	35-113-07284	9318W	SI_WINJ
35-113-05545	13605AW	SI_WINJ	35-113-07285	10002A	SI_OIL
35-113-05546	13614	SI_OIL	35-113-07286	10011	SI_OIL
35-113-05547	13615	SI_OIL	35-113-07287	10106A	OIL
35-113-05548	13617W	P&A_INJ	35-113-07292	9101	PA_PROD
35-113-05549	13813	PA_PROD	35-113-07293	9102	PA_PROD
35-113-05550	13903	SI_OIL	35-113-07294	9103	PA_PROD
35-113-05551	13601W	PA_PROD	35-113-07295	9104	PA_PROD
35-113-05552	13602	PA_PROD	35-113-07296	9105	PA_PROD
35-113-05553	13603W	P&A_INJ	35-113-07319	10801	PA_PROD
35-113-05554	13604	OIL	35-113-07320	10802	PA_PROD
35-113-05555	13605	PA_PROD	35-113-07321	10803	PA_PROD
35-113-05556	13606W	P&A_INJ	35-113-07322	10804	PA_PROD
35-113-05557	13607W	PA_PROD	35-113-07323	10805	PA_PROD
35-113-05558	13608W	P&A_INJ	35-113-07324	10803AW	SI_WINJ
35-113-05559	13609W	P&A_INJ	35-113-07325	10806	SI_OIL
35-113-05560	13610	SI_OIL	35-113-07326	10807	PA_PROD
35-113-05561	13611	PA_PROD	35-113-07412	1079	SI_OIL
35-113-05562	13612W	P&A_INJ	35-113-07413	1062	PA_PROD
35-113-05563	13706	PA_PROD	35-113-07414	10610	PA_PROD
35-113-05571	13504	SI_OIL	35-113-07415	1077	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07416	10608	PA_PROD	35-113-07457	10503	PA_PROD
35-113-07417	10609	PA_PROD	35-113-07458	10504	PA_PROD
35-113-07418	10602	PA_PROD	35-113-07459	10505	PA_PROD
35-113-07419	10603	PA_PROD	35-113-07460	10506	PA_PROD
35-113-07420	10605	PA_PROD	35-113-07461	10507	P&A_INJ
35-113-07421	10606	PA_PROD	35-113-07462	10508	PA_PROD
35-113-07422	10611	PA_PROD	35-113-07463	10509	PA_PROD
35-113-07423	10612	PA_PROD	35-113-07464	10510	PA_PROD
35-113-07424	10613	PA_PROD	35-113-07465	10511	OIL
35-113-07425	10614	P&A_INJ	35-113-07466	10512	PA_PROD
35-113-07426	9801	PA_PROD	35-113-07467	10513	PA_PROD
35-113-07427	9802	PA_PROD	35-113-07468	10514	PA_PROD
35-113-07428	9803	PA_PROD	35-113-07469	10515	SI_OIL
35-113-07429	9804	PA_PROD	35-113-07470	10516	PA_PROD
35-113-07430	9805	PA_PROD	35-113-07471	9601	PA_PROD
35-113-07431	9806	PA_PROD	35-113-07472	9602	PA_PROD
35-113-07432	9807	PA_PROD	35-113-07473	9603	PA_PROD
35-113-07433	9808	PA_PROD	35-113-07474	9604	SI_OIL
35-113-07434	9809	P&A_INJ	35-113-07475	9605	SI_OIL
35-113-07435	9810	PA_PROD	35-113-07476	9606	SI_OIL
35-113-07436	9811	PA_PROD	35-113-07477	9607	PA_PROD
35-113-07437	9812	PA_PROD	35-113-07478	9608	PA_PROD
35-113-07438	9813	P&A_INJ	35-113-07479	9609	PA_PROD
35-113-07439	9814	PA_PROD	35-113-07480	9610	PA_PROD
35-113-07440	9815	PA_PROD	35-113-07481	9611	PA_PROD
35-113-07441	9816	PA_PROD	35-113-07482	9612	PA_PROD
35-113-07442	10701	PA_PROD	35-113-07483	9613	PA_PROD
35-113-07443	10702	PA_PROD	35-113-07484	9614	PA_PROD
35-113-07444	10703	P&A_INJ	35-113-07485	9615	PA_PROD
35-113-07445	1064	PA_PROD	35-113-07486	9616	SI_OIL
35-113-07446	10705	PA_PROD	35-113-07487	9714A	SI_OIL
35-113-07447	10706	PA_PROD	35-113-07488	10409A	PA_PROD
35-113-07448	10707	PA_PROD	35-113-07489	9404A	PA_PROD
35-113-07449	10708	PA_PROD	35-113-07490	9406	P&A_INJ
35-113-07450	10709	PA_PROD	35-113-07491	9418	PA_PROD
35-113-07451	10711	PA_PROD	35-113-07492	10305A	PA_PROD
35-113-07452	10712	PA_PROD	35-113-07493	9501	PA_PROD
35-113-07453	9803A	PA_PROD	35-113-07494	9502	PA_PROD
35-113-07454	9805A	PA_PROD	35-113-07495	9504	SI_OIL
35-113-07455	10501	PA_PROD	35-113-07496	9503	PA_PROD
35-113-07456	10502	OIL	35-113-07497	9503A	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07498	9505	PA_PROD	35-113-07538	9516	PA_PROD
35-113-07499	9506	PA_PROD	35-113-07539	9417	PA_PROD
35-113-07500	9507	PA_PROD	35-113-07542	10901	PA_PROD
35-113-07501	9508	PA_PROD	35-113-07543	10902	PA_PROD
35-113-07502	9509W	W_INJ	35-113-07544	10903	PA_PROD
35-113-07503	9510	PA_PROD	35-113-07545	10904	SI_OIL
35-113-07504	9511	PA_PROD	35-113-07546	10905	PA_PROD
35-113-07505	9512	PA_PROD	35-113-07547	10906	PA_PROD
35-113-07506	9513	SI_OIL	35-113-07548	10907	PA_PROD
35-113-07507	9514	PA_PROD	35-113-07562	10908W	PA_PROD
35-113-07508	9515W	P&A_INJ	35-113-07563	10909	SI_OIL
35-113-07509	9516	SI_OIL	35-113-07564	10911	SI_OIL
35-113-07510	1028	SI_OIL	35-113-07565	10913	SI_OIL
35-113-07511	10211W	P&A_INJ	35-113-07566	11009	SI_OIL
35-113-07512	10215	PA_PROD	35-113-07567	11011	PA_PROD
35-113-07513	10203	SI_OIL	35-113-07568	11012W	SI_WINJ
35-113-07514	10204	PA_PROD	35-113-07569	11603	PA_PROD
35-113-07515	10205	PA_PROD	35-113-07570	11604W	P&A_INJ
35-113-07516	10206	PA_PROD	35-113-07571	11605W	P&A_INJ
35-113-07517	10207	PA_PROD	35-113-07572	11606	PA_PROD
35-113-07518	10208	PA_PROD	35-113-07573	11607	PA_PROD
35-113-07519	10209	PA_PROD	35-113-07574	11608	PA_PROD
35-113-07520	10210	PA_PROD	35-113-07575	11609	PA_PROD
35-113-07521	10212	PA_PROD	35-113-07576	11610	SI_OIL
35-113-07522	10213	SI_OIL	35-113-07577	11611	P&A_INJ
35-113-07523	10214	PA_PROD	35-113-07578	11612	SI_OIL
35-113-07524	10216	PA_PROD	35-113-07579	11601A	SI_OIL
35-113-07525	9401W	SI_WINJ	35-113-07602	12001	PA_PROD
35-113-07526	9402	PA_PROD	35-113-07603	12002W	W_INJ
35-113-07527	9402W	SI_WINJ	35-113-07604	12003	PA_PROD
35-113-07528	9403	SI_OIL	35-113-07605	12004	P&A_INJ
35-113-07529	9404W	P&A_INJ	35-113-07606	12005W	P&A_INJ
35-113-07530	9405	PA_PROD	35-113-07607	12006	PA_PROD
35-113-07530	9405A	SI_OIL	35-113-07608	12007	P&A_INJ
35-113-07531	9409	PA_PROD	35-113-07609	12008	PA_PROD
35-113-07532	9410W	W_INJ	35-113-07610	12009	PA_PROD
35-113-07533	9411	PA_PROD	35-113-07611	12010W	W_INJ
35-113-07534	9412	PA_PROD	35-113-07612	12011W	P&A_INJ
35-113-07535	9413	PA_PROD	35-113-07613	12012	OIL
35-113-07536	9414	PA_PROD	35-113-07614	12013	SI_OIL
35-113-07537	9415	SI_OIL	35-113-07615	12014	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status
35-113-07616	12015W	P&A_INJ
35-113-07617	12016	PA_PROD
35-113-07618	11301	DRY
35-113-07619	11302	PA_PROD
35-113-07620	11303W	P&A_INJ
35-113-07621	11304	PA_PROD
35-113-07622	11305	PA_PROD
35-113-07623	11306	PA_PROD
35-113-07624	11307	PA_PROD
35-113-07625	11308W	P&A_INJ
35-113-07626	11309	P&A_INJ
35-113-07627	11901	PA_PROD
35-113-07628	11902	PA_PROD
35-113-07629	11903W	P&A_INJ
35-113-07630	11904	SI_OIL
35-113-07631	11905	PA_PROD
35-113-07632	11906	PA_PROD
35-113-07633	11907	OIL
35-113-07634	11908	PA_PROD
35-113-07635	11909W	P&A_INJ
35-113-07636	11910W	W_INJ
35-113-07637	11911	P&A_INJ
35-113-07638	11912	PA_PROD
35-113-07639	11913	PA_PROD
35-113-07640	11401	PA_PROD
35-113-07641	11402	PA_PROD
35-113-07642	11403	PA_PROD
35-113-07643	11404	PA_PROD
35-113-07644	11405	PA_PROD
35-113-07645	11406	PA_PROD
35-113-07646	11407	PA_PROD
35-113-07647	11408	PA_PROD
35-113-07648	11409	P&A_INJ
35-113-07649	11410	PA_PROD
35-113-07650	11303	DRY
35-113-07651	11401A	PA_PROD
35-113-07652	12006A	P&A_INJ
35-113-07653	12008A	P&A_INJ
35-113-07654	12009A	P&A_INJ
35-113-07655	12014A	OIL
35-113-07656	12016A	SI_OIL
35-113-07657	11401AW	P&A_INJ
35-113-07658	11801	P&A_INJ
35-113-07659	11802	P&A_INJ
35-113-07660	11803	PA_PROD
35-113-07661	11804	OIL
35-113-07662	11805W	W_INJ
35-113-07663	11806	P&A_INJ
35-113-07664	11807	PA_PROD
35-113-07665	11808	PA_PROD
35-113-07666	11809	PA_PROD
35-113-07667	11810W	P&A_INJ
35-113-07668	11811	PA_PROD
35-113-07669	11812W	P&A_INJ
35-113-07670	11813	PA_PROD
35-113-07671	11814	P&A_INJ
35-113-07672	11815	PA_PROD
35-113-07673	11116	PA_PROD
35-113-07674	11201	PA_PROD
35-113-07675	11202	PA_PROD
35-113-07676	11203	PA_PROD
35-113-07677	11204	PA_PROD
35-113-07678	11205	OIL
35-113-07679	11206W	SI_WINJ
35-113-07680	11207	OIL
35-113-07681	11208	PA_PROD
35-113-07682	11209	PA_PROD
35-113-07683	11103	PA_PROD
35-113-07684	11211W	W_INJ
35-113-07685	11212	P&A_INJ
35-113-07686	11213	PA_PROD
35-113-07687	11214	PA_PROD
35-113-07688	11215	PA_PROD
35-113-07689	11216	P&A_INJ
35-113-07690	11101	PA_PROD
35-113-07691	11102	PA_PROD
35-113-07692	11103W	W_INJ
35-113-07693	11104	PA_PROD
35-113-07694	11105	PA_PROD
35-113-07695	11106	PA_PROD
35-113-07696	11107	PA_PROD
35-113-07697	11108	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07698	11109	PA_PROD	35-113-07773	14504	PA_PROD
35-113-07699	11710	OIL	35-113-07775	12701	PA_PROD
35-113-07700	11110	PA_PROD	35-113-07776	12702	PA_PROD
35-113-07701	11111	PA_PROD	35-113-07777	12703	SI_OIL
35-113-07702	11112	PA_PROD	35-113-07778	12704	SI_OIL
35-113-07703	11113	OIL	35-113-07779	12705	PA_PROD
35-113-07704	11114	SI_OIL	35-113-07780	12706	PA_PROD
35-113-07705	11115W	P&A_INJ	35-113-07781	12707	PA_PROD
35-113-07707	11701	PA_PROD	35-113-07782	12708	PA_PROD
35-113-07708	11702	PA_PROD	35-113-07783	12709	PA_PROD
35-113-07709	11704	P&A_INJ	35-113-07784	12710	P&A_INJ
35-113-07710	11705	OIL	35-113-07785	12711	PA_PROD
35-113-07711	11706	PA_PROD	35-113-07786	12712	PA_PROD
35-113-07712	11707W	P&A_INJ	35-113-07787	12713	PA_PROD
35-113-07713	11709W	W_INJ	35-113-07788	12814	SI_OIL
35-113-07714	11711W	P&A_INJ	35-113-07789	12715	PA_PROD
35-113-07715	11712	SI_OIL	35-113-07790	12716	SI_OIL
35-113-07716	11713W	P&A_INJ	35-113-07791	12801	PA_PROD
35-113-07717	11714	PA_PROD	35-113-07792	12802	OIL
35-113-07718	11715W	P&A_INJ	35-113-07793	12803	OIL
35-113-07719	11716	PA_PROD	35-113-07794	12804	PA_PROD
35-113-07720	11501	PA_PROD	35-113-07795	12805	OIL
35-113-07721	11502	PA_PROD	35-113-07796	12806	SI_OIL
35-113-07722	11503	PA_PROD	35-113-07797	12807	PA_PROD
35-113-07723	11504	DRY	35-113-07798	12808A	PA_PROD
35-113-07724	11505	P&A_INJ	35-113-07799	12809	SI_OIL
35-113-07725	11506	PA_PROD	35-113-07800	12810	P&A_INJ
35-113-07726	12101	PA_PROD	35-113-07801	12811W	SI_WINJ
35-113-07727	12102W	P&A_INJ	35-113-07802	12812	PA_PROD
35-113-07728	12103	PA_PROD	35-113-07803	12813W	P&A_INJ
35-113-07729	12104W	P&A_INJ	35-113-07804	12814	PA_PROD
35-113-07730	12105W	P&A_INJ	35-113-07805	12815	PA_PROD
35-113-07765	12501	PA_PROD	35-113-07806	12301	PA_PROD
35-113-07766	12502W	P&A_INJ	35-113-07807	12302	OIL
35-113-07767	12503	PA_PROD	35-113-07808	12303	PA_PROD
35-113-07767	12503A	PA_PROD	35-113-07809	12304W	P&A_INJ
35-113-07768	12504	PA_PROD	35-113-07810	12305W	P&A_INJ
35-113-07769	12505	P&A_INJ	35-113-07811	12306	PA_PROD
35-113-07770	14501	PA_PROD	35-113-07812	12307	OIL
35-113-07771	14502	PA_PROD	35-113-07813	12308W	P&A_INJ
35-113-07772	14503	PA_PROD	35-113-07814	12309	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07815	12311	P&A_INJ	35-113-07856	12204W	W_INJ
35-113-07816	12312W	P&A_INJ	35-113-07857	12205W	P&A_INJ
35-113-07817	12313	PA_PROD	35-113-07858	12206W	P&A_INJ
35-113-07818	12314W	P&A_INJ	35-113-07859	12207W	W_INJ
35-113-07819	12315	PA_PROD	35-113-07860	12208	PA_PROD
35-113-07820	12316	PA_PROD	35-113-07861	12209W	P&A_INJ
35-113-07821	12310	PA_PROD	35-113-07862	12211W	P&A_INJ
35-113-07822	12401	PA_PROD	35-113-07863	12212	PA_PROD
35-113-07823	12402	PA_PROD	35-113-07864	12213W	P&A_INJ
35-113-07824	12403	SI_OIL	35-113-07865	12214	OIL
35-113-07825	12405W	P&A_INJ	35-113-07866	12215	SI_OIL
35-113-07826	12406W	P&A_INJ	35-113-07867	12216	PA_PROD
35-113-07827	12407	PA_PROD	35-113-07868	14401	PA_PROD
35-113-07828	12408W	W_INJ	35-113-07869	14402	PA_PROD
35-113-07829	12409	OIL	35-113-07870	14403	PA_PROD
35-113-07830	12410W	W_INJ	35-113-07871	14404	PA_PROD
35-113-07831	12411W	W_INJ	35-113-07872	14405	PA_PROD
35-113-07832	12412W	P&A_INJ	35-113-07873	14406	SI_OIL
35-113-07833	12413	PA_PROD	35-113-07884	12207A	SI_OIL
35-113-07834	12404	PA_PROD	35-113-07885	12608W	P&A_INJ
35-113-07835	12301AW	W_INJ	35-113-07886	12609	SI_OIL
35-113-07836	12316W	P&A_INJ	35-113-07887	12615	SI_OIL
35-113-07837	12401A	SI_OIL	35-113-07888	12616	P&A_INJ
35-113-07838	12804W	P&A_INJ	35-113-07889	14401A	PA_PROD
35-113-07839	12414	PA_PROD	35-113-07890	14402A	PA_PROD
35-113-07840	12416W	P&A_INJ	35-113-07891	14406W	P&A_INJ
35-113-07841	12808W	P&A_INJ	35-113-07892	14408	PA_PROD
35-113-07842	12601	P&A_INJ	35-113-07893	14409	SI_OIL
35-113-07843	12602	PA_PROD	35-113-07894	14412	PA_PROD
35-113-07844	12603	OIL	35-113-07895	14413	PA_PROD
35-113-07845	12604	PA_PROD	35-113-07896	14414	PA_PROD
35-113-07846	12605	SI_OIL	35-113-07942	13209	PA_PROD
35-113-07847	12606	SI_OIL	35-113-07994	12902	OIL
35-113-07848	12610	SI_OIL	35-113-07995	12903	SI_OIL
35-113-07849	12611W	W_INJ	35-113-07996	12904	PA_PROD
35-113-07850	12612	PA_PROD	35-113-07997	12905W	W_INJ
35-113-07851	12613W	P&A_INJ	35-113-07998	12906W	P&A_INJ
35-113-07852	12614	SI_OIL	35-113-07999	12907	PA_PROD
35-113-07853	12201W	P&A_INJ	35-113-08000	12908W	W_INJ
35-113-07854	12202	OIL	35-113-08001	12909	OIL
35-113-07855	12203W	P&A_INJ	35-113-08002	12910	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08003	12911	P&A_INJ	35-113-08053	502	SI_OIL
35-113-08004	12912	SI_OIL	35-113-08054	521W	P&A_INJ
35-113-08005	12913	PA_PROD	35-113-08055	522W	P&A_INJ
35-113-08006	12914	SI_OIL	35-113-08056	523W	P&A_INJ
35-113-08007	13201W	SI_WINJ	35-113-08057	524W	P&A_INJ
35-113-08008	13202	SI_OIL	35-113-08058	526W	P&A_INJ
35-113-08010	13204	PA_PROD	35-113-08059	527W	W_INJ
35-113-08011	13207	PA_PROD	35-113-08060	528W	P&A_INJ
35-113-08012	13208	SI_OIL	35-113-08061	201	PA_PROD
35-113-08013	13211W	SI_WINJ	35-113-08062	202	DRY
35-113-08022	702	PA_PROD	35-113-08063	203	DRY
35-113-08023	703	PA_PROD	35-113-08064	204	DRY
35-113-08024	705	PA_PROD	35-113-08065	205	DRY
35-113-08025	706	DRY	35-113-08067	503	OIL
35-113-08026	613	PA_PROD	35-113-08068	401	PA_PROD
35-113-08027	616	DRY	35-113-08069	407	PA_PROD
35-113-08028	601	OIL	35-113-08070	104	PA_PROD
35-113-08029	611	OIL	35-113-08074	301	OIL
35-113-08030	621W	P&A_INJ	35-113-08075	302	OIL
35-113-08031	622W	P&A_INJ	35-113-08076	303	OIL
35-113-08032	623W	WAG	35-113-08077	304	SI_OIL
35-113-08033	624W	P&A_INJ	35-113-08078	305W	SI_WINJ
35-113-08034	625W	P&A_INJ	35-113-08079	306A	SI_OIL
35-113-08035	721W	P&A_INJ	35-113-08080	307	PA_PROD
35-113-08036	207	PA_PROD	35-113-08085	308	SI_OIL
35-113-08037	106	SI_OIL	35-113-08086	309	SI_OIL
35-113-08038	107W	DRY	35-113-08087	310	OIL
35-113-08039	525W	P&A_INJ	35-113-08088	322W	P&A_INJ
35-113-08040	104A	SI_OIL	35-113-08089	323W	W_INJ
35-113-08041	401A	OIL	35-113-08090	324W	W_INJ
35-113-08042	409	OIL	35-113-08091	325W	P&A_INJ
35-113-08043	410	OIL	35-113-08092	326W	W_INJ
35-113-08044	411	OIL	35-113-08093	327W	SI_WINJ
35-113-08045	421W	P&A_INJ	35-113-08094	328W	W_INJ
35-113-08046	422W	WAG	35-113-08095	801	OIL
35-113-08047	423W	P&A_INJ	35-113-08096	1401	OIL
35-113-08048	424W	P&A_INJ	35-113-08097	803	OIL
35-113-08049	425W	P&A_INJ	35-113-08098	804	OIL
35-113-08050	426W	W_INJ	35-113-08099	805	PA_PROD
35-113-08051	427W	P&A_INJ	35-113-08100	806	OIL
35-113-08052	428W	W_INJ	35-113-08101	807	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08102	808	P&A_INJ	35-113-08143	1024W	P&A_INJ
35-113-08103	809	P&A_INJ	35-113-08144	1025W	WAG
35-113-08104	810W	W_INJ	35-113-08145	1026W	P&A_INJ
35-113-08105	811	OIL	35-113-08146	1027W	WAG
35-113-08106	812W	TA_OIL	35-113-08147	1028W	P&A_INJ
35-113-08107	813	PA_PROD	35-113-08148	1510A	OIL
35-113-08108	816	OIL	35-113-08149	1521W	WAG
35-113-08109	822W	P&A_INJ	35-113-08150	1522W	WAG
35-113-08110	823W	P&A_INJ	35-113-08151	1523W	P&A_INJ
35-113-08111	824W	P&A_INJ	35-113-08152	1524W	P&A_INJ
35-113-08112	826W	P&A_INJ	35-113-08153	1525W	WAG
35-113-08113	827W	P&A_INJ	35-113-08154	1526W	P&A_INJ
35-113-08114	828W	WAG	35-113-08155	1527W	WAG
35-113-08115	1422W	W_INJ	35-113-08156	1528W	P&A_INJ
35-113-08116	1427W	P&A_INJ	35-113-08157	1621W	P&A_INJ
35-113-08117	902	OIL	35-113-08158	1622W	P&A_INJ
35-113-08118	903	PA_PROD	35-113-08159	1623W	P&A_INJ
35-113-08119	904	OIL	35-113-08160	1624W	WAG
35-113-08120	905	PA_PROD	35-113-08161	1625W	WAG
35-113-08121	906	PA_PROD	35-113-08162	1626W	P&A_INJ
35-113-08122	907	PA_PROD	35-113-08163	1627W	WAG
35-113-08123	908	OIL	35-113-08164	1017	DRY
35-113-08124	909	PA_PROD	35-113-08165	1517W	P&A_INJ
35-113-08125	910	P&A_INJ	35-113-08166	1121W	P&A_INJ
35-113-08126	911	SI_OIL	35-113-08167	1122W	P&A_INJ
35-113-08127	912	OIL	35-113-08168	1123W	WAG
35-113-08128	913	PA_PROD	35-113-08169	1124W	P&A_INJ
35-113-08129	914	PA_PROD	35-113-08170	1125W	P&A_INJ
35-113-08130	915	P&A_INJ	35-113-08171	1126W	WAG
35-113-08131	916	OIL	35-113-08172	1127W	P&A_INJ
35-113-08132	921W	WAG	35-113-08173	1128W	WAG
35-113-08133	922W	P&A_INJ	35-113-08174	1221W	WAG
35-113-08134	923W	WAG	35-113-08175	1222W	P&A_INJ
35-113-08135	924W	PA_PROD	35-113-08176	1223W	W_INJ
35-113-08136	925W	WAG	35-113-08177	1224W	P&A_INJ
35-113-08137	926W	P&A_INJ	35-113-08178	1225W	WAG
35-113-08138	927W	WAG	35-113-08179	1226W	P&A_INJ
35-113-08139	928W	P&A_INJ	35-113-08180	1227W	P&A_INJ
35-113-08140	1021W	P&A_INJ	35-113-08181	1721W	P&A_INJ
35-113-08141	1022W	P&A_INJ	35-113-08182	1722W	P&A_INJ
35-113-08142	1023W	WAG	35-113-08183	1723W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08184	1724W	WAG	35-113-08226	2621W	P&A_INJ
35-113-08185	1725W	P&A_INJ	35-113-08227	2622W	P&A_INJ
35-113-08186	1726W	P&A_INJ	35-113-08228	2623W	P&A_INJ
35-113-08187	1727W	P&A_INJ	35-113-08229	2624W	P&A_INJ
35-113-08188	1728W	P&A_INJ	35-113-08230	2625W	WAG
35-113-08189	1821W	WAG	35-113-08231	2626	P&A_INJ
35-113-08190	1822W	P&A_INJ	35-113-08232	2627W	P&A_INJ
35-113-08191	1823	P&A_INJ	35-113-08233	2628W	SI_WINJ
35-113-08192	1825W	P&A_INJ	35-113-08234	3321W	PA_PROD
35-113-08193	1826W	P&A_INJ	35-113-08235	3323W	PA_PROD
35-113-08194	1827W	P&A_INJ	35-113-08236	3325W	P&A_INJ
35-113-08195	1828W	W_INJ	35-113-08237	3327W	P&A_INJ
35-113-08196	1802	P&A_INJ	35-113-08238	3404	PA_PROD
35-113-08197	1803	OIL	35-113-08238	3404A	OIL
35-113-08198	1804	PA_PROD	35-113-08239	3421W	P&A_INJ
35-113-08199	1805	P&A_INJ	35-113-08240	3423W	P&A_INJ
35-113-08200	1806	P&A_INJ	35-113-08241	3425W	WAG
35-113-08201	1807	P&A_INJ	35-113-08242	3427W	P&A_INJ
35-113-08202	1808	OIL	35-113-08243	2601	OIL
35-113-08204	1810	OIL	35-113-08244	2602	OIL
35-113-08205	1811	OIL	35-113-08245	2603	OIL
35-113-08206	1812	OIL	35-113-08246	2604	OIL
35-113-08207	1813	PA_PROD	35-113-08247	2605	W_INJ
35-113-08208	1814	OIL	35-113-08248	2606	PA_PROD
35-113-08209	1815	OIL	35-113-08249	2607W	P&A_INJ
35-113-08210	1816	P&A_INJ	35-113-08250	2608	PA_PROD
35-113-08211	1801	OIL	35-113-08251	2609	P&A_INJ
35-113-08212	1209	OIL	35-113-08252	2610	PA_PROD
35-113-08213	1210	OIL	35-113-08253	2611	OIL
35-113-08214	1217	P&A_INJ	35-113-08254	2612	PA_PROD
35-113-08215	2502A	OIL	35-113-08255	2613	OIL
35-113-08216	2503A	OIL	35-113-08256	2614	OIL
35-113-08217	2511A	OIL	35-113-08257	2615	PA_PROD
35-113-08218	2521W	WAG	35-113-08258	2616	SI_WINJ
35-113-08219	2522W	P&A_INJ	35-113-08259	2501	OIL
35-113-08220	2523W	P&A_INJ	35-113-08261	2503	PA_PROD
35-113-08221	2524W	WAG	35-113-08262	2504	PA_PROD
35-113-08222	2525W	P&A_INJ	35-113-08263	2505	PA_PROD
35-113-08223	2526W	P&A_INJ	35-113-08264	2506	PA_PROD
35-113-08224	2527W	P&A_INJ	35-113-08265	2507	PA_PROD
35-113-08225	2528W	P&A_INJ	35-113-08266	2508	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08268	2510	PA_PROD	35-113-08312	3206	PA_PROD
35-113-08269	2511	PA_PROD	35-113-08313	3203	OIL
35-113-08270	2512	PA_PROD	35-113-08314	3208	PA_PROD
35-113-08271	2513	PA_PROD	35-113-08315	3209	PA_PROD
35-113-08272	2514	PA_PROD	35-113-08316	3210	PA_PROD
35-113-08273	2515	OIL	35-113-08317	3211	SI_OIL
35-113-08275	3401	PA_PROD	35-113-08318	3212	PA_PROD
35-113-08276	3402	OIL	35-113-08319	3213	PA_PROD
35-113-08277	3403	PA_PROD	35-113-08320	3214	PA_PROD
35-113-08277	3403A	OIL	35-113-08321	3215	OIL
35-113-08279	3405W	P&A_INJ	35-113-08322	3216	OIL
35-113-08280	3406	PA_PROD	35-113-08323	3101A	OIL
35-113-08281	3407	PA_PROD	35-113-08324	3101	PA_PROD
35-113-08282	3408	PA_PROD	35-113-08325	3102	OIL
35-113-08283	3409	PA_PROD	35-113-08326	3103	OIL
35-113-08284	3410	OIL	35-113-08327	3104	DRY
35-113-08285	3411	OIL	35-113-08328	3104A	OIL
35-113-08286	3412	OIL	35-113-08329	3105	PA_PROD
35-113-08287	3413	PA_PROD	35-113-08330	3106	OIL
35-113-08288	3414	PA_PROD	35-113-08331	3107	PA_PROD
35-113-08289	3415	PA_PROD	35-113-08332	3108	PA_PROD
35-113-08290	3416	PA_PROD	35-113-08333	3109	PA_PROD
35-113-08291	3301	OIL	35-113-08334	3110	PA_PROD
35-113-08292	3302	OIL	35-113-08335	3111	OIL
35-113-08293	3303	OIL	35-113-08336	3112	PA_PROD
35-113-08294	3304	OIL	35-113-08337	3113	PA_PROD
35-113-08295	3305	PA_PROD	35-113-08338	3114	PA_PROD
35-113-08296	3306	OIL	35-113-08339	3115	OIL
35-113-08297	3307	PA_PROD	35-113-08340	3116	OIL
35-113-08298	3308	PA_PROD	35-113-08341	2301	OIL
35-113-08300	3310	PA_PROD	35-113-08342	2302A	OIL
35-113-08301	3311	OIL	35-113-08343	2303	PA_PROD
35-113-08302	3312	PA_PROD	35-113-08344	2304	PA_PROD
35-113-08303	3313	PA_PROD	35-113-08345	2305	PA_PROD
35-113-08304	3314	P&A_INJ	35-113-08346	2306	PA_PROD
35-113-08305	3315	OIL	35-113-08347	2307W	WAG
35-113-08306	3316	OIL	35-113-08348	2308	PA_PROD
35-113-08307	321	PA_PROD	35-113-08349	2309	OIL
35-113-08308	3202	OIL	35-113-08350	2310	OIL
35-113-08310	3204	OIL	35-113-08351	2311	PA_PROD
35-113-08311	3205	PA_PROD	35-113-08352	2312	OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08353	2313	PA_PROD	35-113-08412	2201	OIL
35-113-08354	2314	P&A_INJ	35-113-08413	2202W	W_INJ
35-113-08355	2315	PA_PROD	35-113-08414	2203	OIL
35-113-08356	2316	PA_PROD	35-113-08415	2204W	P&A_INJ
35-113-08357	2321W	WAG	35-113-08416	2205	OIL
35-113-08358	2323W	P&A_INJ	35-113-08417	2206	PA_PROD
35-113-08359	2325W	WAG	35-113-08418	2207	OIL
35-113-08360	2326W	P&A_INJ	35-113-08419	2208	PA_PROD
35-113-08361	2327W	P&A_INJ	35-113-08420	2209	OIL
35-113-08362	2328W	WAG	35-113-08421	2210	PA_PROD
35-113-08363	2421W	WAG	35-113-08422	2211	P&A_INJ
35-113-08364	2422W	P&A_INJ	35-113-08423	2212	PA_PROD
35-113-08365	2423W	P&A_INJ	35-113-08424	2213	PA_PROD
35-113-08366	2424W	WAG	35-113-08425	2214	PA_PROD
35-113-08367	2425W	P&A_INJ	35-113-08426	2215	OIL
35-113-08368	2426W	P&A_INJ	35-113-08427	2216	PA_PROD
35-113-08369	2427W	P&A_INJ	35-113-08428	3801	PA_PROD
35-113-08370	2428W	P&A_INJ	35-113-08429	3802	PA_PROD
35-113-08371	3121W	P&A_INJ	35-113-08429	3802A	SI_OIL
35-113-08372	3123W	P&A_INJ	35-113-08430	3803	P&A_INJ
35-113-08373	3125W	WAG	35-113-08431	3804	PA_PROD
35-113-08374	3127W	P&A_INJ	35-113-08431	3804A	SI_OIL
35-113-08375	3221W	P&A_INJ	35-113-08432	3805	SI_OIL
35-113-08376	3223W	WAG	35-113-08433	3806	PA_PROD
35-113-08377	3225W	WAG	35-113-08434	3807	PA_PROD
35-113-08378	3227W	WAG	35-113-08435	3808W	P&A_INJ
35-113-08394	2223W	P&A_INJ	35-113-08436	3809	PA_PROD
35-113-08395	2227W	P&A_INJ	35-113-08437	3810	PA_PROD
35-113-08396	3008A	PA_PROD	35-113-08438	3811	PA_PROD
35-113-08397	3015A	OIL	35-113-08439	3812W	P&A_INJ
35-113-08398	3022W	P&A_INJ	35-113-08440	3813W	P&A_INJ
35-113-08399	3023W	W_INJ	35-113-08441	3814	PA_PROD
35-113-08400	3025W	W_INJ	35-113-08442	3815W	SI_WINJ
35-113-08401	3027W	W_INJ	35-113-08443	3816	PA_PROD
35-113-08402	3001	SI_OIL	35-113-08444	4701	P&A_INJ
35-113-08403	3002	SI_OIL	35-113-08445	4702	P&A_INJ
35-113-08404	3003	PA_PROD	35-113-08445	4702AW	SI_WINJ
35-113-08405	3004	PA_PROD	35-113-08446	4703	PA_PROD
35-113-08406	3006	PA_PROD	35-113-08447	4704	P&A_INJ
35-113-08407	3011	OIL	35-113-08448	4706	PA_PROD
35-113-08408	3012	OIL	35-113-08449	4707	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08450	4708	P&A_INJ	35-113-08491	4016	OIL
35-113-08451	4709	PA_PROD	35-113-08492	4101	PA_PROD
35-113-08452	4710	P&A_INJ	35-113-08492	4101A	SI_OIL
35-113-08453	4711	PA_PROD	35-113-08493	4102	SI_OIL
35-113-08454	4712	PA_PROD	35-113-08494	4103	PA_PROD
35-113-08455	3827W	P&A_INJ	35-113-08494	4103A	SI_OIL
35-113-08456	4728W	P&A_INJ	35-113-08495	4104	SI_OIL
35-113-08457	3921W	P&A_INJ	35-113-08496	4105	PA_PROD
35-113-08458	3923W	P&A_INJ	35-113-08497	4106	PA_PROD
35-113-08459	3925W	WAG	35-113-08498	4107	PA_PROD
35-113-08460	3927W	P&A_INJ	35-113-08499	4108	PA_PROD
35-113-08461	4021W	P&A_INJ	35-113-08500	4109	PA_PROD
35-113-08462	4023W	P&A_INJ	35-113-08501	4110	PA_PROD
35-113-08463	4025W	P&A_INJ	35-113-08502	4111	OIL
35-113-08464	4027W	P&A_INJ	35-113-08503	4112	OIL
35-113-08465	4825W	P&A_INJ	35-113-08504	4113	SI_OIL
35-113-08466	4827W	P&A_INJ	35-113-08505	4114	OIL
35-113-08467	4922W	P&A_INJ	35-113-08505	4114W	P&A_INJ
35-113-08468	4923W	P&A_INJ	35-113-08506	4115	PA_PROD
35-113-08469	4925W	P&A_INJ	35-113-08507	4116	WAG
35-113-08470	4927W	SI_WINJ	35-113-08508	5101	SI_OIL
35-113-08471	3901	SI_OIL	35-113-08509	5102	PA_PROD
35-113-08473	3908	PA_PROD	35-113-08510	5103	SI_OIL
35-113-08474	3917	P&A_INJ	35-113-08511	5104	SI_OIL
35-113-08475	4001	PA_PROD	35-113-08512	5105	PA_PROD
35-113-08475	4001A	SI_OIL	35-113-08513	5106	PA_PROD
35-113-08476	4002	PA_PROD	35-113-08514	5107	P&A_INJ
35-113-08477	4003W	W_INJ	35-113-08515	5130W	W_INJ
35-113-08478	4004	SI_OIL	35-113-08516	5109	PA_PROD
35-113-08479	4005	PA_PROD	35-113-08517	5110	PA_PROD
35-113-08480	4006W	W_INJ	35-113-08518	5111	OIL
35-113-08481	4007	PA_PROD	35-113-08519	5112	SI_OIL
35-113-08482	4008	PA_PROD	35-113-08520	5113	PA_PROD
35-113-08483	4009	PA_PROD	35-113-08521	5114	PA_PROD
35-113-08484	4010	PA_PROD	35-113-08522	5115	SI_OIL
35-113-08485	4011	PA_PROD	35-113-08523	4116	PA_PROD
35-113-08486	4012	PA_PROD	35-113-08524	4141W	P&A_INJ
35-113-08487	4013	OIL	35-113-08525	4121AW	SI_WINJ
35-113-08488	4014A	SI_OIL	35-113-08525	4121W	P&A_INJ
35-113-08489	4014	PA_PROD	35-113-08526	4128AW	SI_WINJ
35-113-08490	4015W	SI_WINJ	35-113-08526	4128W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08527	4125W	WAG	35-113-08568	6410	SI_WINJ
35-113-08528	4127W	P&A_INJ	35-113-08569	6411	OIL
35-113-08529	4131W	P&A_INJ	35-113-08570	6412	OIL
35-113-08530	4232D	SWD	35-113-08571	6501W	P&A_INJ
35-113-08531	4223W	P&A_INJ	35-113-08572	6502W	P&A_INJ
35-113-08532	4225W	W_INJ	35-113-08573	6505W	P&A_INJ
35-113-08533	4227W	P&A_INJ	35-113-08574	6407	PA_PROD
35-113-08534	5005A	TA_OIL	35-113-08575	6506W	W_INJ
35-113-08535	5024W	P&A_INJ	35-113-08577	6514	SI_OIL
35-113-08536	5025W	P&A_INJ	35-113-08589	7305	P&A_INJ
35-113-08537	5027W	P&A_INJ	35-113-08590	7306W	P&A_INJ
35-113-08538	5121W	P&A_INJ	35-113-08591	7307	SI_OIL
35-113-08539	5123W	P&A_INJ	35-113-08592	7307W	P&A_INJ
35-113-08540	5122W	P&A_INJ	35-113-08593	7308	SI_OIL
35-113-08541	5125W	SI_WINJ	35-113-08594	7308W	SI_WINJ
35-113-08542	5127W	P&A_INJ	35-113-08595	7309	PA_PROD
35-113-08543	5821W	P&A_INJ	35-113-08596	7310W	SI_WINJ
35-113-08544	5917	SI_OIL	35-113-08597	7311	SI_OIL
35-113-08545	5921W	P&A_INJ	35-113-08598	7312W	SI_WINJ
35-113-08546	5923W	P&A_INJ	35-113-08599	7313	SI_OIL
35-113-08547	5925W	P&A_INJ	35-113-08600	7314	PA_PROD
35-113-08548	5926W	W_INJ	35-113-08601	7315	SI_OIL
35-113-08549	5927W	SI_WINJ	35-113-08602	7413	SI_OIL
35-113-08550	6611	SI_OIL	35-113-08603	7414	SI_OIL
35-113-08551	6601W	P&A_INJ	35-113-08604	8202	SI_OIL
35-113-08552	6602W	W_INJ	35-113-08605	8203	PA_PROD
35-113-08553	6604W	P&A_INJ	35-113-08606	8204W	SI_WINJ
35-113-08554	6703W	SI_WINJ	35-113-08607	8205	PA_PROD
35-113-08555	6705W	W_INJ	35-113-08608	8206W	SI_WINJ
35-113-08556	6707W	P&A_INJ	35-113-08609	8207	SI_OIL
35-113-08557	6709A	PA_PROD	35-113-08610	8208	PA_PROD
35-113-08558	5612	SI_OIL	35-113-08611	8208W	P&A_INJ
35-113-08559	5613	SI_OIL	35-113-08612	8301A	PA_PROD
35-113-08560	5614	PA_PROD	35-113-08613	8305W	SI_WINJ
35-113-08561	5624W	P&A_INJ	35-113-08614	8306W	SI_WINJ
35-113-08562	5628W	P&A_INJ	35-113-08615	8307A	SI_OIL
35-113-08563	5721W	P&A_INJ	35-113-08616	8307W	SI_WINJ
35-113-08564	5723W	P&A_INJ	35-113-08617	8308W	P&A_INJ
35-113-08565	6401W	W_INJ	35-113-08618	8301	PA_PROD
35-113-08566	6403W	SI_WINJ	35-113-08619	8302	PA_PROD
35-113-08567	6409	SI_OIL	35-113-08620	8303	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08621	8304	PA_PROD	35-113-08664	7608	PA_PROD
35-113-08622	8305	PA_PROD	35-113-08665	7609	PA_PROD
35-113-08623	8306	PA_PROD	35-113-08666	7610	PA_PROD
35-113-08624	8307	PA_PROD	35-113-08667	7611	PA_PROD
35-113-08625	8308	PA_PROD	35-113-08668	7612	PA_PROD
35-113-08626	8310	PA_PROD	35-113-08669	7613	PA_PROD
35-113-08627	8311	PA_PROD	35-113-08670	7614	SI_OIL
35-113-08628	8410	PA_PROD	35-113-08671	7615	PA_PROD
35-113-08629	8404	SI_OIL	35-113-08674	8502	PA_PROD
35-113-08630	8405	PA_PROD	35-113-08675	8503W	P&A_INJ
35-113-08632	8403	PA_PROD	35-113-08676	8504	SI_OIL
35-113-08633	8406	PA_PROD	35-113-08677	8505	PA_PROD
35-113-08634	8407	P&A_INJ	35-113-08678	8506	SI_OIL
35-113-08635	848	PA_PROD	35-113-08679	8507	PA_PROD
35-113-08635	8408	SI_OIL	35-113-08680	8508W	P&A_INJ
35-113-08637	8411	SI_OIL	35-113-08681	8509	PA_PROD
35-113-08638	7510	SI_OIL	35-113-08682	8510	PA_PROD
35-113-08639	7511	OIL	35-113-08683	8511	PA_PROD
35-113-08640	7512	SI_OIL	35-113-08684	8512	PA_PROD
35-113-08641	7602	PA_PROD	35-113-08685	8513	DRY
35-113-08641	7602A	OIL	35-113-08686	8514	PA_PROD
35-113-08643	7613A	OIL	35-113-08687	7501	PA_PROD
35-113-08644	7617	SI_OIL	35-113-08688	7502	PA_PROD
35-113-08645	7618	PA_PROD	35-113-08689	7503	DRY
35-113-08646	8301W	P&A_INJ	35-113-08690	7507	PA_PROD
35-113-08647	8405W	P&A_INJ	35-113-08691	7509	PA_PROD
35-113-08648	8406A	SI_OIL	35-113-08693	7508	PA_PROD
35-113-08649	8406W	W_INJ	35-113-08694	14201	PA_PROD
35-113-08650	8407W	W_INJ	35-113-08695	14202	DRY
35-113-08651	8417A	OIL	35-113-08696	14203	DRY
35-113-08652	8505W	P&A_INJ	35-113-08697	1309	SI_OIL
35-113-08653	8506W	W_INJ	35-113-08698	1301	PA_PROD
35-113-08654	8509W	P&A_INJ	35-113-08699	1302	PA_PROD
35-113-08655	8515	SI_OIL	35-113-08700	1303	PA_PROD
35-113-08656	8516	OIL	35-113-08701	1304	PA_PROD
35-113-08657	7601	PA_PROD	35-113-08703	1306	P&A_INJ
35-113-08659	7603	PA_PROD	35-113-08704	1307	PA_PROD
35-113-08660	7504	PA_PROD	35-113-08705	1310	PA_PROD
35-113-08661	7605	SI_OIL	35-113-08706	1313	P&A_INJ
35-113-08662	7606	PA_PROD	35-113-08707	2001	PA_PROD
35-113-08663	7607	PA_PROD	35-113-08708	2003	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08709	2004	SI_OIL	35-113-08763	3707	SI_OIL
35-113-08710	2005	PA_PROD	35-113-08764	3708	SI_OIL
35-113-08711	1906W	P&A_INJ	35-113-08765	3709	PA_PROD
35-113-08712	2007	PA_PROD	35-113-08766	3710	SI_OIL
35-113-08713	2008	PA_PROD	35-113-08767	3721W	SI_WINJ
35-113-08714	2009	SI_OIL	35-113-08768	3725W	SI_WINJ
35-113-08715	2010	PA_PROD	35-113-08769	3726W	P&A_INJ
35-113-08716	2011	SI_OIL	35-113-08770	3703	PA_PROD
35-113-08717	2013	PA_PROD	35-113-08771	3704	P&A_INJ
35-113-08718	2014	SI_OIL	35-113-08772	3705W	SI_WINJ
35-113-08719	1907	PA_PROD	35-113-08773	3706	PA_PROD
35-113-08720	1908	PA_PROD	35-113-08777	3532	UNKNW
35-113-08721	1911	SI_OIL	35-113-08778	2721W	P&A_INJ
35-113-08722	1912	SI_OIL	35-113-08779	2722W	P&A_INJ
35-113-08723	1915	PA_PROD	35-113-08780	2723W	P&A_INJ
35-113-08724	1916	PA_PROD	35-113-08781	2724W	SI_WINJ
35-113-08725	1321W	P&A_INJ	35-113-08782	2725W	P&A_INJ
35-113-08726	1322W	P&A_INJ	35-113-08783	2726W	SI_WINJ
35-113-08727	1323W	P&A_INJ	35-113-08784	2727W	SI_WINJ
35-113-08728	1324W	P&A_INJ	35-113-08785	2728W	P&A_INJ
35-113-08729	1325W	P&A_INJ	35-113-08786	2801A	PA_PROD
35-113-08730	1921W	P&A_INJ	35-113-08787	2821W	P&A_INJ
35-113-08731	1922W	SI_WINJ	35-113-08788	2822W	P&A_INJ
35-113-08732	1923W	P&A_INJ	35-113-08789	2823W	P&A_INJ
35-113-08733	1924W	P&A_INJ	35-113-08790	2824W	P&A_INJ
35-113-08734	1925	P&A_INJ	35-113-08791	2825W	P&A_INJ
35-113-08735	1926W	SI_WINJ	35-113-08792	2826W	P&A_INJ
35-113-08736	1927W	P&A_INJ	35-113-08793	2827W	P&A_INJ
35-113-08737	1928W	P&A_INJ	35-113-08794	2828W	P&A_INJ
35-113-08738	2002	SI_OIL	35-113-08795	3521W	SI_WINJ
35-113-08739	20W21	P&A_INJ	35-113-08796	3523W	P&A_INJ
35-113-08740	20W22	P&A_INJ	35-113-08797	3525W	P&A_INJ
35-113-08741	20W24	P&A_INJ	35-113-08798	3527W	SI_WINJ
35-113-08742	20W25	P&A_INJ	35-113-08799	3616	SI_OIL
35-113-08743	2101	PA_PROD	35-113-08800	3621W	P&A_INJ
35-113-08744	2102	DRY	35-113-08801	3622W	P&A_INJ
35-113-08745	2103	PA_PROD	35-113-08802	3624W	SI_WINJ
35-113-08759	2921W	P&A_INJ	35-113-08803	3625W	SI_WINJ
35-113-08760	2922W	P&A_INJ	35-113-08804	3627W	P&A_INJ
35-113-08761	2923W	P&A_INJ	35-113-08805	3628W	P&A_INJ
35-113-08762	2925W	P&A_INJ	35-113-08806	2701	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08807	2702	SI_OIL	35-113-08850	4301	SI_OIL
35-113-08808	2703A	PA_PROD	35-113-08851	4302	OIL
35-113-08809	2704	SI_OIL	35-113-08852	4303	SI_OIL
35-113-08810	2705	P&A_INJ	35-113-08853	4304	OIL
35-113-08811	2706	PA_PROD	35-113-08854	4305	PA_PROD
35-113-08812	2708	PA_PROD	35-113-08856	4307	PA_PROD
35-113-08813	2709	TA_OIL	35-113-08857	4308	PA_PROD
35-113-08814	2710	PA_PROD	35-113-08858	4309	PA_PROD
35-113-08815	2711	PA_PROD	35-113-08859	4310	PA_PROD
35-113-08816	2712	PA_PROD	35-113-08860	4311	SI_OIL
35-113-08817	3501	PA_PROD	35-113-08861	4312	DRY
35-113-08818	3502	PA_PROD	35-113-08862	2713A	SI_OIL
35-113-08819	3503	SI_OIL	35-113-08863	4313	OIL
35-113-08820	3504	SI_OIL	35-113-08864	4315	PA_PROD
35-113-08821	3505	PA_PROD	35-113-08865	4316	PA_PROD
35-113-08822	3506	PA_PROD	35-113-08866	4314	SI_OIL
35-113-08823	3507	PA_PROD	35-113-08866	4314A	OIL
35-113-08824	3508	PA_PROD	35-113-08867	4322W	W_INJ
35-113-08825	3509	PA_PROD	35-113-08868	4324W	W_INJ
35-113-08826	3510	PA_PROD	35-113-08869	4325W	W_INJ
35-113-08827	3511	SI_OIL	35-113-08870	4327W	SI_WINJ
35-113-08828	3512	PA_PROD	35-113-08871	4422W	P&A_INJ
35-113-08829	3513W	P&A_INJ	35-113-08872	4424W	SI_WINJ
35-113-08830	3514	PA_PROD	35-113-08873	4425W	SI_WINJ
35-113-08831	3515	PA_PROD	35-113-08874	4426W	W_INJ
35-113-08832	3516	PA_PROD	35-113-08875	4428W	P&A_INJ
35-113-08833	5301A	SI_OIL	35-113-08876	5221W	P&A_INJ
35-113-08834	5301	PA_PROD	35-113-08877	5222W	P&A_INJ
35-113-08835	5302	OIL	35-113-08878	5223W	W_INJ
35-113-08836	5303	SI_OIL	35-113-08879	5224W	P&A_INJ
35-113-08837	5304	PA_PROD	35-113-08880	5225W	P&A_INJ
35-113-08838	5305	SI_OIL	35-113-08881	5227W	P&A_INJ
35-113-08839	5306W	P&A_INJ	35-113-08882	5304A	OIL
35-113-08840	5307	PA_PROD	35-113-08883	5321W	P&A_INJ
35-113-08841	5308W	P&A_INJ	35-113-08884	5322W	SI_WINJ
35-113-08843	5310	PA_PROD	35-113-08885	5323W	P&A_INJ
35-113-08845	5312	SI_OIL	35-113-08886	5324W	P&A_INJ
35-113-08846	5313	PA_PROD	35-113-08887	5325W	W_INJ
35-113-08847	5314	PA_PROD	35-113-08888	5327W	P&A_INJ
35-113-08848	5315	OIL	35-113-08889	4401	SI_OIL
35-113-08849	5316	PA_PROD	35-113-08890	4402	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08891	4403	PA_PROD	35-113-08939	5410	PA_PROD
35-113-08892	4404	PA_PROD	35-113-08940	5411	PA_PROD
35-113-08893	4405	PA_PROD	35-113-08941	5412	PA_PROD
35-113-08894	4406	PA_PROD	35-113-08942	5413	PA_PROD
35-113-08895	4407W	P&A_INJ	35-113-08943	5414	PA_PROD
35-113-08896	4408	PA_PROD	35-113-08944	5415	PA_PROD
35-113-08897	4409	SI_OIL	35-113-08945	5416	PA_PROD
35-113-08898	4410	SI_OIL	35-113-08970	7201	PA_PROD
35-113-08899	4411	PA_PROD	35-113-08971	7202	PA_PROD
35-113-08900	4411A	PA_PROD	35-113-08972	7203	PA_PROD
35-113-08901	4412	SI_OIL	35-113-08973	7204	PA_PROD
35-113-08902	4413	SI_OIL	35-113-08974	7205	PA_PROD
35-113-08903	4414	SI_OIL	35-113-08975	6	PA_PROD
35-113-08904	4414A	PA_PROD	35-113-08976	7208	PA_PROD
35-113-08905	4415	PA_PROD	35-113-08977	7209	PA_PROD
35-113-08913	4502A	SI_OIL	35-113-08978	7210	PA_PROD
35-113-08914	4508	PA_PROD	35-113-08979	1	PA_PROD
35-113-08915	4509	SI_OIL	35-113-08980	2	SI_OIL
35-113-08916	4521W	SI_WINJ	35-113-09001	7	SI_OIL
35-113-08917	4522W	P&A_INJ	35-113-09002	7201W	P&A_INJ
35-113-08918	4524W	SI_WINJ	35-113-09003	7205W	P&A_INJ
35-113-08919	4526W	SI_WINJ	35-113-09004	7209A	PA_PROD
35-113-08920	5404A	PA_PROD	35-113-09005	6201	PA_PROD
35-113-08921	5405A	PA_PROD	35-113-09006	6202	PA_PROD
35-113-08922	5410A	PA_PROD	35-113-09007	6203	PA_PROD
35-113-08923	5421W	P&A_INJ	35-113-09008	6204	PA_PROD
35-113-08924	5422W	P&A_INJ	35-113-09009	6205	PA_PROD
35-113-08925	5423W	P&A_INJ	35-113-09010	6206	PA_PROD
35-113-08926	5424W	P&A_INJ	35-113-09011	6207	PA_PROD
35-113-08927	5425W	P&A_INJ	35-113-09012	6208	PA_PROD
35-113-08928	5427W	P&A_INJ	35-113-09013	6209	PA_PROD
35-113-08929	5521W	P&A_INJ	35-113-09014	6210	PA_PROD
35-113-08930	5525W	P&A_INJ	35-113-09016	6212	PA_PROD
35-113-08931	5401	PA_PROD	35-113-09017	6213	PA_PROD
35-113-08932	5402	PA_PROD	35-113-09018	6214	PA_PROD
35-113-08933	5403	PA_PROD	35-113-09019	6215	PA_PROD
35-113-08934	5404	PA_PROD	35-113-09020	6216	PA_PROD
35-113-08935	5405	PA_PROD	35-113-09021	6221W	P&A_INJ
35-113-08936	5406	PA_PROD	35-113-09022	6222W	P&A_INJ
35-113-08937	5407	PA_PROD	35-113-09023	6223W	P&A_INJ
35-113-08938	5409	P&A_INJ	35-113-09024	6224W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09025	6225W	P&A_INJ	35-113-09066	7003	PA_PROD
35-113-09026	6226W	P&A_INJ	35-113-09067	7004	PA_PROD
35-113-09027	6227W	P&A_INJ	35-113-09068	7005	PA_PROD
35-113-09028	6228W	P&A_INJ	35-113-09069	7006	PA_PROD
35-113-09029	6308	PA_PROD	35-113-09070	7007	PA_PROD
35-113-09030	6321W	P&A_INJ	35-113-09071	7008	PA_PROD
35-113-09031	6322W	P&A_INJ	35-113-09072	7009	PA_PROD
35-113-09032	6325W	P&A_INJ	35-113-09073	7010	PA_PROD
35-113-09033	7001A	SI_OIL	35-113-09074	7011	PA_PROD
35-113-09034	7001W	P&A_INJ	35-113-09075	7012	PA_PROD
35-113-09035	7002W	P&A_INJ	35-113-09076	7013	PA_PROD
35-113-09036	7003W	P&A_INJ	35-113-09077	7014	P&A_INJ
35-113-09037	7004W	P&A_INJ	35-113-09078	7015	PA_PROD
35-113-09038	7005W	P&A_INJ	35-113-09079	7016	PA_PROD
35-113-09039	7006W	P&A_INJ	35-113-09080	6301	PA_PROD
35-113-09040	7007W	SI_WINJ	35-113-09081	6021W	P&A_INJ
35-113-09041	7008W	P&A_INJ	35-113-09082	6022W	P&A_INJ
35-113-09042	7013A	SI_OIL	35-113-09083	6024W	SI_WINJ
35-113-09043	7101W	P&A_INJ	35-113-09084	6025W	SI_WINJ
35-113-09044	7102W	P&A_INJ	35-113-09085	6026W	SI_WINJ
35-113-09045	7103W	P&A_INJ	35-113-09086	6028W	W_INJ
35-113-09046	7104W	P&A_INJ	35-113-09087	6121W	W_INJ
35-113-09047	7105W	P&A_INJ	35-113-09088	6122W	SI_WINJ
35-113-09048	7106W	P&A_INJ	35-113-09089	6123W	P&A_INJ
35-113-09049	7107W	P&A_INJ	35-113-09090	6124W	SI_WINJ
35-113-09050	708	PA_PROD	35-113-09091	6125W	P&A_INJ
35-113-09051	7101	PA_PROD	35-113-09092	4306	PA_PROD
35-113-09052	7102	PA_PROD	35-113-09093	6126W	W_INJ
35-113-09053	7103	PA_PROD	35-113-09094	6127W	SI_WINJ
35-113-09054	7104	PA_PROD	35-113-09095	6128W	P&A_INJ
35-113-09055	7105	PA_PROD	35-113-09096	6801W	SI_WINJ
35-113-09056	7106	SI_OIL	35-113-09097	6802W	SI_WINJ
35-113-09057	7107	PA_PROD	35-113-09098	6803W	SI_WINJ
35-113-09058	7108	PA_PROD	35-113-09099	6804W	P&A_INJ
35-113-09059	7109	PA_PROD	35-113-09100	6805W	P&A_INJ
35-113-09060	7110	P&A_INJ	35-113-09101	6806W	P&A_INJ
35-113-09061	7111	SI_OIL	35-113-09102	6807W	P&A_INJ
35-113-09062	7112	PA_PROD	35-113-09103	6808W	SI_WINJ
35-113-09063	7113	PA_PROD	35-113-09104	6901W	P&A_INJ
35-113-09064	7001	PA_PROD	35-113-09105	6902W	SI_WINJ
35-113-09065	7002	PA_PROD	35-113-09106	6903W	SI_WINJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09107	69W4	SI_WINJ	35-113-09149	6807	PA_PROD
35-113-09108	6905W	SI_WINJ	35-113-09150	6813	PA_PROD
35-113-09109	6906W	P&A_INJ	35-113-09151	6805	PA_PROD
35-113-09110	6907W	P&A_INJ	35-113-09152	6808	PA_PROD
35-113-09111	6908W	P&A_INJ	35-113-09153	6809	PA_PROD
35-113-09112	6101	PA_PROD	35-113-09154	6810	SI_OIL
35-113-09113	6102	OIL	35-113-09155	6811W	P&A_INJ
35-113-09114	6103	PA_PROD	35-113-09156	6812	PA_PROD
35-113-09115	6104	SI_OIL	35-113-09157	6814	PA_PROD
35-113-09116	6105	PA_PROD	35-113-09158	6815	PA_PROD
35-113-09117	6106	PA_PROD	35-113-09159	6816	PA_PROD
35-113-09118	6107	PA_PROD	35-113-09160	6817	PA_PROD
35-113-09119	6108	PA_PROD	35-113-09161	8601	PA_PROD
35-113-09120	6109	PA_PROD	35-113-09162	8602	PA_PROD
35-113-09121	6110	PA_PROD	35-113-09163	8603	PA_PROD
35-113-09122	6111	SI_OIL	35-113-09164	8604	PA_PROD
35-113-09124	6113	PA_PROD	35-113-09165	8606	OIL
35-113-09125	6114	PA_PROD	35-113-09166	8607	PA_PROD
35-113-09126	6115	PA_PROD	35-113-09167	8608	PA_PROD
35-113-09127	6116	PA_PROD	35-113-09168	8609	SI_OIL
35-113-09128	6901	PA_PROD	35-113-09169	8610	PA_PROD
35-113-09129	6902	SI_OIL	35-113-09170	8611	PA_PROD
35-113-09130	6903	SI_OIL	35-113-09171	8612	PA_PROD
35-113-09131	6904	PA_PROD	35-113-09172	8613	PA_PROD
35-113-09132	6905	PA_PROD	35-113-09173	8614	PA_PROD
35-113-09133	6906	PA_PROD	35-113-09174	8615	P&A_INJ
35-113-09134	6907	SI_OIL	35-113-09175	8616	P&A_INJ
35-113-09135	6908	PA_PROD	35-113-09176	8701	PA_PROD
35-113-09136	6909	PA_PROD	35-113-09177	8702	PA_PROD
35-113-09137	6910	PA_PROD	35-113-09179	8704	PA_PROD
35-113-09138	6911	PA_PROD	35-113-09180	8705	PA_PROD
35-113-09139	6912	PA_PROD	35-113-09181	8706	PA_PROD
35-113-09140	6913	PA_PROD	35-113-09182	8707	PA_PROD
35-113-09141	6914	SI_OIL	35-113-09183	8708	PA_PROD
35-113-09142	6915	SI_OIL	35-113-09184	8709	PA_PROD
35-113-09143	6916	PA_PROD	35-113-09185	8710	SI_OIL
35-113-09144	6801	PA_PROD	35-113-09186	8711	P&A_INJ
35-113-09145	6802	SI_OIL	35-113-09187	8712	PA_PROD
35-113-09146	6803	PA_PROD	35-113-09188	8613	PA_PROD
35-113-09147	6804	PA_PROD	35-113-09188	8713	OIL
35-113-09148	6806	PA_PROD	35-113-09189	8714	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09190	8715	PA_PROD	35-113-09232	7710	PA_PROD
35-113-09191	8716	P&A_INJ	35-113-09233	7706	PA_PROD
35-113-09192	7801	PA_PROD	35-113-09234	7713	PA_PROD
35-113-09193	7802	PA_PROD	35-113-09235	867	SI_OIL
35-113-09194	7803A	SI_OIL	35-113-09236	8801	SI_OIL
35-113-09195	7804	OIL	35-113-09237	8802	PA_PROD
35-113-09196	7805	PA_PROD	35-113-09238	8803	PA_PROD
35-113-09197	7806	PA_PROD	35-113-09239	8804	PA_PROD
35-113-09198	7807	PA_PROD	35-113-09240	8805	PA_PROD
35-113-09199	7808	SI_OIL	35-113-09241	8806	SI_OIL
35-113-09200	7809	SI_OIL	35-113-09242	8807	PA_PROD
35-113-09201	7810	OIL	35-113-09243	8808	SI_OIL
35-113-09202	7811	SI_OIL	35-113-09244	8809	PA_PROD
35-113-09203	7812	SI_OIL	35-113-09245	8810	P&A_INJ
35-113-09204	7813	OIL	35-113-09246	8811	PA_PROD
35-113-09205	7814	PA_PROD	35-113-09247	8812	PA_PROD
35-113-09206	7815	P&A_INJ	35-113-09248	8813	OIL
35-113-09207	7816	SI_OIL	35-113-09249	8814	PA_PROD
35-113-09208	771A	PA_PROD	35-113-09250	8815	PA_PROD
35-113-09209	7702A	SI_OIL	35-113-09251	8816	PA_PROD
35-113-09210	7704A	SI_OIL	35-113-09252	7901	PA_PROD
35-113-09211	7708	SI_OIL	35-113-09253	7902	PA_PROD
35-113-09212	7717	SI_OIL	35-113-09254	7903	PA_PROD
35-113-09213	8616A	SI_OIL	35-113-09255	7904	PA_PROD
35-113-09214	8617	OIL	35-113-09256	7905A	PA_PROD
35-113-09215	8605W	W_INJ	35-113-09257	7906	PA_PROD
35-113-09216	8606W	SI_WINJ	35-113-09258	8807	SI_OIL
35-113-09217	8607W	SI_WINJ	35-113-09259	7908	SI_OIL
35-113-09218	8608W	P&A_INJ	35-113-09260	7909	SI_OIL
35-113-09219	7701	PA_PROD	35-113-09261	7910	PA_PROD
35-113-09220	7702	PA_PROD	35-113-09262	7911	SI_OIL
35-113-09221	7703	PA_PROD	35-113-09263	7912	SI_OIL
35-113-09222	7705	PA_PROD	35-113-09264	7913	SI_OIL
35-113-09223	7707	PA_PROD	35-113-09265	7914	PA_PROD
35-113-09225	7709	PA_PROD	35-113-09266	7915	P&A_INJ
35-113-09226	7711W	W_INJ	35-113-09267	7916	SI_OIL
35-113-09227	7712	SI_OIL	35-113-09268	8007A	SI_OIL
35-113-09228	7714	PA_PROD	35-113-09269	8807W	SI_WINJ
35-113-09229	7715	PA_PROD	35-113-09270	8809A	PA_PROD
35-113-09230	7716	PA_PROD	35-113-09271	8903A	SI_OIL
35-113-09231	7704	PA_PROD	35-113-09272	8905A	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09273	8905W	SI_WINJ	35-113-09318	9003	PA_PROD
35-113-09274	8906W	W_INJ	35-113-09319	9004	PA_PROD
35-113-09275	8907W	SI_WINJ	35-113-09320	9005	PA_PROD
35-113-09276	8901	PA_PROD	35-113-09321	9006	P&A_INJ
35-113-09277	8902	PA_PROD	35-113-09322	9007	PA_PROD
35-113-09278	8903	PA_PROD	35-113-09323	9008	SI_OIL
35-113-09279	8904	PA_PROD	35-113-09324	9009	SI_OIL
35-113-09280	8905	PA_PROD	35-113-09325	9010	PA_PROD
35-113-09281	8906	SI_OIL	35-113-09326	9011	PA_PROD
35-113-09282	8907	PA_PROD	35-113-09327	9012	OIL
35-113-09283	8908	PA_PROD	35-113-09328	9013	P&A_INJ
35-113-09284	8909	PA_PROD	35-113-09329	9014	SI_OIL
35-113-09285	8910	PA_PROD	35-113-09330	9015	SI_OIL
35-113-09286	8911	SI_OIL	35-113-09331	9016	PA_PROD
35-113-09287	8912	PA_PROD	35-113-09332	8101	PA_PROD
35-113-09288	8913	PA_PROD	35-113-09333	812	PA_PROD
35-113-09289	8914	PA_PROD	35-113-09334	8103	P&A_INJ
35-113-09290	8915	OIL	35-113-09335	8104	SI_OIL
35-113-09291	8916	PA_PROD	35-113-09336	8105	PA_PROD
35-113-09292	8003	SI_OIL	35-113-09337	8106	PA_PROD
35-113-09293	8004	PA_PROD	35-113-09338	8107	SI_OIL
35-113-09294	8005	PA_PROD	35-113-09339	8108	PA_PROD
35-113-09295	8006	SI_OIL	35-113-09340	8109	PA_PROD
35-113-09296	8007	PA_PROD	35-113-09341	8110	PA_PROD
35-113-09297	8008A	PA_PROD	35-113-09342	8111	PA_PROD
35-113-09298	8009	PA_PROD	35-113-09343	8112	P&A_INJ
35-113-09299	8010	PA_PROD	35-113-09971	610	OIL
35-113-09300	8011	SI_OIL	35-113-09972	602	OIL
35-113-09301	8012	OIL	35-113-09973	603	OIL
35-113-09302	8013	OIL	35-113-09974	605	PA_PROD
35-113-09303	8014	PA_PROD	35-113-09975	607	PA_PROD
35-113-09308	8113A	SI_OIL	35-113-09976	608	PA_PROD
35-113-09309	9006W	SI_WINJ	35-113-09977	609	OIL
35-113-09310	9007W	P&A_INJ	35-113-09979	604	OIL
35-113-09311	14301	PA_PROD	35-113-09980	606	P&A_INJ
35-113-09312	14302	PA_PROD	35-113-09983	961A	SI_OIL
35-113-09313	14303	PA_PROD	35-113-10648	7505	PA_PROD
35-113-09314	14304	PA_PROD	35-113-10649	752	PA_PROD
35-113-09315	14305	PA_PROD	35-113-10650	5508	DRY
35-113-09316	9001	PA_PROD	35-113-20605	3017	OIL
35-113-09317	9002	PA_PROD	35-113-21008	8717	OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-21339	1018	WAG	35-113-31831	9316	PA_PROD
35-113-21699	6613	OIL	35-113-31832	10101	PA_PROD
35-113-22373	10518D	SI_SWD	35-113-31833	10102	PA_PROD
35-113-22414	9732W	W_INJ	35-113-31834	10103	PA_PROD
35-113-22415	11401B	DRY	35-113-31835	10104	PA_PROD
35-113-22420	9723	SI_OIL	35-113-31836	10105	PA_PROD
35-113-22421	9724	SI_OIL	35-113-31837	10107	SI_OIL
35-113-22422	9729	SI_OIL	35-113-31838	10108	PA_PROD
35-113-22423	9735	SI_OIL	35-113-31839	10109	PA_PROD
35-113-22424	9736	SI_OIL	35-113-31840	10110	PA_PROD
35-113-22433	9730W	SI_WINJ	35-113-31841	10111	PA_PROD
35-113-22453	9731W	SI_WINJ	35-113-31842	10112	PA_PROD
35-113-22454	9733	OIL	35-113-31842	10112A	SI_OIL
35-113-22455	9734	SI_OIL	35-113-31844	10114	P&A_INJ
35-113-22495	9728	SI_OIL	35-113-31845	10115	PA_PROD
35-113-22507	9717	SI_OIL	35-113-31847	9202	SI_OIL
35-113-22508	9721	SI_OIL	35-113-31848	9203	PA_PROD
35-113-22509	9722	SI_OIL	35-113-31849	9204	PA_PROD
35-113-22539	7619	OIL	35-113-31850	9205	SI_OIL
35-113-25173	3429	OIL	35-113-31851	9206	SI_OIL
35-113-25310	5030	TA_OIL	35-113-31852	9207	PA_PROD
35-113-25336	5131	SI_OIL	35-113-31853	9208	PA_PROD
35-113-25337	5132	SI_OIL	35-113-31854	9209	PA_PROD
35-113-25359	5229	SI_OIL	35-113-31855	9210	SI_OIL
35-113-25360	5230	SI_OIL	35-113-31856	9211	P&A_INJ
35-113-25376	5228	OIL	35-113-31857	9212	SI_OIL
35-113-26892	43836	DRY	35-113-31858	9213	SI_OIL
35-113-26925	5233W	W_INJ	35-113-31859	9214	PA_PROD
35-113-31081	14201A	SI_OIL	35-113-31860	9215	OIL
35-113-31201	11902W	P&A_INJ	35-113-31861	9216	PA_PROD
35-113-31201	12016AW	SI_OIL	35-113-31862	10001	PA_PROD
35-113-31270	105	SI_OIL	35-113-31863	10002	SI_OIL
35-113-31821	9301	PA_PROD	35-113-31864	10003	PA_PROD
35-113-31823	9304	SI_OIL	35-113-31865	10004	PA_PROD
35-113-31823	9304A	PA_PROD	35-113-31866	10005	PA_PROD
35-113-31824	9305	PA_PROD	35-113-31867	10006	PA_PROD
35-113-31825	9306	SI_OIL	35-113-31868	10007	PA_PROD
35-113-31826	9307	PA_PROD	35-113-31870	10008	PA_PROD
35-113-31827	9309	PA_PROD	35-113-31871	10009	PA_PROD
35-113-31829	9313	P&A_INJ	35-113-31872	10010	PA_PROD
35-113-31830	9315	PA_PROD	35-113-31873	10015	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-31874	10016	PA_PROD	35-113-31967	10604	PA_PROD
35-113-31875	9201W	SI_WINJ	35-113-31968	9801W	P&A_INJ
35-113-31876	10101W	P&A_INJ	35-113-31969	9901W	P&A_INJ
35-113-31877	9202W	P&A_INJ	35-113-31970	9802W	P&A_INJ
35-113-31878	101WI	P&A_INJ	35-113-31971	9902W	P&A_INJ
35-113-31879	9203W	SI_WINJ	35-113-31972	9803W	P&A_INJ
35-113-31880	9303A	PA_PROD	35-113-31973	9804W	P&A_INJ
35-113-31881	10003W	SI_WINJ	35-113-31974	9805W	P&A_INJ
35-113-31882	10103W	P&A_INJ	35-113-31975	9806W	P&A_INJ
35-113-31883	9204W	SI_WINJ	35-113-31976	106W6	P&A_INJ
35-113-31884	10004W	SI_WINJ	35-113-31977	10706W	DRY
35-113-31885	10104W	P&A_INJ	35-113-31978	9807W	P&A_INJ
35-113-31886	9205W	SI_WINJ	35-113-31979	106W8	P&A_INJ
35-113-31887	10005W	P&A_INJ	35-113-31980	10401	PA_PROD
35-113-31888	10105W	P&A_INJ	35-113-31981	10402	PA_PROD
35-113-31889	9206W	P&A_INJ	35-113-31982	10403	PA_PROD
35-113-31890	10006W	P&A_INJ	35-113-31983	10404	SI_OIL
35-113-31891	9207W	P&A_INJ	35-113-31984	10405	PA_PROD
35-113-31892	10007W	SI_WINJ	35-113-31985	10406	PA_PROD
35-113-31893	10107W	TA_INJ	35-113-31986	10407	PA_PROD
35-113-31894	10008W	P&A_INJ	35-113-31987	10408	PA_PROD
35-113-31895	10108W	W_INJ	35-113-31988	10409	PA_PROD
35-113-31896	10116	PA_PROD	35-113-31989	10410	PA_PROD
35-113-31897	9104A	PA_PROD	35-113-31990	10411	SI_OIL
35-113-31898	9107W	P&A_INJ	35-113-31991	10412	PA_PROD
35-113-31899	9108W	P&A_INJ	35-113-31992	10413	SI_OIL
35-113-31901	9106	PA_PROD	35-113-31993	10414	SI_OIL
35-113-31902	9107	PA_PROD	35-113-31994	10415	P&A_INJ
35-113-31909	10806W	P&A_INJ	35-113-31995	10416	PA_PROD
35-113-31910	10807W	P&A_INJ	35-113-31996	9701	OIL
35-113-31911	10808W	SI_WINJ	35-113-31997	9702	PA_PROD
35-113-31955	9901	PA_PROD	35-113-31998	9703	PA_PROD
35-113-31956	9902	PA_PROD	35-113-31999	9704	PA_PROD
35-113-31957	9903	PA_PROD	35-113-32000	9705	PA_PROD
35-113-31958	9904	PA_PROD	35-113-32001	9706	SI_OIL
35-113-31959	9905	PA_PROD	35-113-32002	9707	PA_PROD
35-113-31962	9907	PA_PROD	35-113-32003	9708	SI_OIL
35-113-31963	9908	PA_PROD	35-113-32004	9709	SI_OIL
35-113-31964	9909	PA_PROD	35-113-32005	9710	PA_PROD
35-113-31965	9910	P&A_INJ	35-113-32006	9711	P&A_INJ
35-113-31966	10601	PA_PROD	35-113-32007	9712	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-32008	9713	PA_PROD	35-113-32047	10202	PA_PROD
35-113-32009	9714	PA_PROD	35-113-32048	10301	DRY
35-113-32010	975	PA_PROD	35-113-32048	10301A	PA_PROD
35-113-32011	9716	PA_PROD	35-113-32049	10302	SI_OIL
35-113-32012	10504W	UNKNW	35-113-32050	10304	PA_PROD
35-113-32013	9601W	SI_WINJ	35-113-32051	10305	PA_PROD
35-113-32014	9718W	SI_WINJ	35-113-32052	10306A	SI_OIL
35-113-32015	10401W	SI_WINJ	35-113-32053	10307	PA_PROD
35-113-32016	10501W	P&A_INJ	35-113-32054	10308	PA_PROD
35-113-32017	9602A	PA_PROD	35-113-32055	10309	OIL
35-113-32018	9702W	P&A_INJ	35-113-32056	10310	PA_PROD
35-113-32019	10402W	P&A_INJ	35-113-32057	10311	PA_PROD
35-113-32020	10502W	P&A_INJ	35-113-32058	10312	PA_PROD
35-113-32021	9603W	P&A_INJ	35-113-32059	10313	PA_PROD
35-113-32022	9703W	P&A_INJ	35-113-32060	10314	PA_PROD
35-113-32023	10403W	P&A_INJ	35-113-32061	10315W	P&A_INJ
35-113-32024	10503W	W_INJ	35-113-32062	10201W	P&A_INJ
35-113-32025	9604W	SI_WINJ	35-113-32063	10301W	P&A_INJ
35-113-32026	9704W	P&A_INJ	35-113-32064	10202W	P&A_INJ
35-113-32027	10404W	W_INJ	35-113-32065	10302W	P&A_INJ
35-113-32028	9605W	SI_WINJ	35-113-32066	9503W	SI_WINJ
35-113-32029	9705W	P&A_INJ	35-113-32067	10203W	SI_WINJ
35-113-32030	10405W	SI_WINJ	35-113-32068	10303W	P&A_INJ
35-113-32031	10505W	SI_WINJ	35-113-32069	9504W	W_INJ
35-113-32032	9606W	SI_WINJ	35-113-32070	10204W	P&A_INJ
35-113-32033	9706W	P&A_INJ	35-113-32071	10304W	SI_WINJ
35-113-32034	10406W	P&A_INJ	35-113-32072	9505W	W_INJ
35-113-32035	10506W	SI_WINJ	35-113-32073	10205W	W_INJ
35-113-32036	9607W	SI_WINJ	35-113-32074	10305W	P&A_INJ
35-113-32037	9707W	P&A_INJ	35-113-32075	9506A	PA_PROD
35-113-32038	10407W	SI_WINJ	35-113-32076	9506W	P&A_INJ
35-113-32039	10507W	W_INJ	35-113-32077	10206W	W_INJ
35-113-32040	9608A	SI_OIL	35-113-32078	10306	SI_OIL
35-113-32041	9608W	P&A_INJ	35-113-32079	10306W	P&A_INJ
35-113-32042	9708W	P&A_INJ	35-113-32080	9507W	W_INJ
35-113-32043	10408W	SI_WINJ	35-113-32081	10207W	SI_WINJ
35-113-32044	10408A	OIL	35-113-32082	10307W	P&A_INJ
35-113-32045	10508W	W_INJ	35-113-32083	9508W	P&A_INJ
35-113-32046	1021	PA_PROD	35-113-32084	10208W	P&A_INJ
35-113-32046	10201	PA_PROD	35-113-32085	10308W	P&A_INJ
35-113-32046	10201A	PA_PROD	35-113-32086	10314A	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-32087	10217D	SI_WINJ	35-113-32173	12816W	P&A_INJ
35-113-32088	11601	PA_PROD	35-113-32174	12701W	P&A_INJ
35-113-32089	11602	P&A_INJ	35-113-32175	12702W	P&A_INJ
35-113-32090	11001	PA_PROD	35-113-32176	12703W	P&A_INJ
35-113-32091	11002	PA_PROD	35-113-32177	12705W	P&A_INJ
35-113-32092	11003	PA_PROD	35-113-32178	12706W	P&A_INJ
35-113-32093	11004	PA_PROD	35-113-32179	12707W	P&A_INJ
35-113-32094	11005	PA_PROD	35-113-32180	12708W	P&A_INJ
35-113-32095	11006W	SI_WINJ	35-113-32181	12709W	P&A_INJ
35-113-32096	11007	OIL	35-113-32182	12717	SI_WTR_SRVC
35-113-32097	11008	SI_OIL	35-113-32184	14403A	SI_OIL
35-113-32098	10905W	P&A_INJ	35-113-32185	14410	SI_OIL
35-113-32099	11005W	P&A_INJ	35-113-32186	14411	SI_OIL
35-113-32100	10906W	P&A_INJ	35-113-32188	12601A	PA_PROD
35-113-32102	10907W	P&A_INJ	35-113-32192	14404A	SI_OIL
35-113-32103	10908	P&A_INJ	35-113-32193	14405A	PA_PROD
35-113-32104	10928W	SI_WINJ	35-113-32194	14407W	W_INJ
35-113-32105	10912	PA_PROD	35-113-32220	13212	PA_PROD
35-113-32106	11407AW	PA_PROD	35-113-32221	13214W	P&A_INJ
35-113-32107	11008W	P&A_INJ	35-113-32222	13215	SI_OIL
35-113-32108	11009W	SI_WINJ	35-113-32223	13216	PA_PROD
35-113-32109	11010	PA_PROD	35-113-32229	13411W	P&A_INJ
35-113-32110	11106W	P&A_INJ	35-113-32230	13412	SI_OIL
35-113-32111	11206	PA_PROD	35-113-32231	13413	PA_PROD
35-113-32112	11108W	P&A_INJ	35-113-32232	13301W	SI_WINJ
35-113-32113	11208W	P&A_INJ	35-113-32233	13302	P&A_INJ
35-113-32114	11110W	W_INJ	35-113-32234	13303W	P&A_INJ
35-113-32115	11112W	P&A_INJ	35-113-32235	13304	PA_PROD
35-113-32116	11205W	SI_WINJ	35-113-32236	13308W	P&A_INJ
35-113-32117	11708	OIL	35-113-32237	13309W	P&A_INJ
35-113-32118	11908W	P&A_INJ	35-113-32238	13310	PA_PROD
35-113-32119	11411W	P&A_INJ	35-113-32239	13311W	P&A_INJ
35-113-32120	11914	OIL	35-113-32240	13312	SI_OIL
35-113-32121	11307AW	P&A_INJ	35-113-32241	13313	PA_PROD
35-113-32122	1203A	PA_PROD	35-113-32242	13314W	P&A_INJ
35-113-32123	11306A	P&A_INJ	35-113-32243	13315	PA_PROD
35-113-32167	9312	PA_PROD	35-113-32244	13316W	P&A_INJ
35-113-32169	14502W	P&A_INJ	35-113-32245	13101	PA_PROD
35-113-32170	14504W	P&A_INJ	35-113-32246	13401	SI_OIL
35-113-32171	12415	PA_PROD	35-113-32247	13102W	P&A_INJ
35-113-32172	12815W	P&A_INJ	35-113-32248	13402	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-32249	13103	PA_PROD	35-113-32373	13702W	P&A_INJ
35-113-32250	13403W	P&A_INJ	35-113-32374	13703	SI_OIL
35-113-32251	13104W	P&A_INJ	35-113-32375	13704W	SI_WINJ
35-113-32252	13404	SI_OIL	35-113-32376	13705	SI_OIL
35-113-32253	13105	P&A_INJ	35-113-32377	13707W	P&A_INJ
35-113-32254	13405W	P&A_INJ	35-113-32378	13708	PA_PROD
35-113-32255	13406	SI_OIL	35-113-32379	13709	OIL
35-113-32257	13407W	P&A_INJ	35-113-32380	13710W	SI_WINJ
35-113-32258	13108W	P&A_INJ	35-113-32381	13711	PA_PROD
35-113-32259	13408W	SI_WINJ	35-113-32382	13613	P&A_INJ
35-113-32260	13109W	P&A_INJ	35-113-32384	13501	PA_PROD
35-113-32261	13409W	SI_WINJ	35-113-32458	14102A	SI_OIL
35-113-32262	13110	PA_PROD	35-113-32459	14105	PA_PROD
35-113-32263	13410W	SI_WINJ	35-113-32461	14001	PA_PROD
35-113-32264	13111W	SI_WINJ	35-113-32462	14101	SI_OIL
35-113-32265	13112	PA_PROD	35-113-32463	1403	DRY
35-113-32266	13113W	P&A_INJ	35-113-32464	14103	PA_PROD
35-113-32267	13114	OIL	35-113-32465	14104	PA_PROD
35-113-32268	13115	PA_PROD	35-113-32467	14005W	P&A_INJ
35-113-32285	14601	PA_PROD	35-113-33494	101	PA_PROD
35-113-32286	14602	PA_PROD	35-113-33495	102	DRY
35-113-32287	14603	P&A_INJ	35-113-33496	402	SI_OIL
35-113-32288	14604	DRY	35-113-33497	103	DRY
35-113-32355	13806	SI_OIL	35-113-33498	403	PA_PROD
35-113-32356	13801W	PA_PROD	35-113-33498	403A	SI_OIL
35-113-32357	13802	PA_PROD	35-113-33499	404	OIL
35-113-32358	13803	SI_OIL	35-113-33500	405	P&A_INJ
35-113-32359	13804	SI_OIL	35-113-33501	406	PA_PROD
35-113-32360	13902W	SI_WINJ	35-113-33502	408W	P&A_INJ
35-113-32361	13807	P&A_INJ	35-113-33503	814	PA_PROD
35-113-32362	13808	SI_OIL	35-113-33504	815	P&A_INJ
35-113-32363	13809W	P&A_INJ	35-113-33506	1402	OIL
35-113-32364	13814W	SI_WINJ	35-113-33507	1403W	W_INJ
35-113-32365	13815W	P&A_INJ	35-113-33508	1404	SI_OIL
35-113-32366	13816	DRY	35-113-33509	1405W	W_INJ
35-113-32367	13810W	P&A_INJ	35-113-33510	1406	PA_PROD
35-113-32368	13811	SI_OIL	35-113-33511	1407	OIL
35-113-32369	13812W	PA_PROD	35-113-33512	1408	PA_PROD
35-113-32370	13616W	P&A_INJ	35-113-33513	1409	P&A_INJ
35-113-32371	13901	OIL	35-113-33514	1410W	P&A_INJ
35-113-32372	13701	SI_OIL	35-113-33515	1411	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33516	1412	PA_PROD	35-113-33558	1613	P&A_INJ
35-113-33517	1413	OIL	35-113-33559	1013	PA_PROD
35-113-33518	1414	OIL	35-113-33560	1614	PA_PROD
35-113-33519	1415	P&A_INJ	35-113-33561	1514	PA_PROD
35-113-33520	1416W	P&A_INJ	35-113-33562	1014	P&A_INJ
35-113-33521	901	PA_PROD	35-113-33563	1515	PA_PROD
35-113-33522	1501	OIL	35-113-33564	1615A	PA_PROD
35-113-33523	1601	OIL	35-113-33565	1015	PA_PROD
35-113-33524	1001	OIL	35-113-33566	1516	PA_PROD
35-113-33525	1502	OIL	35-113-33567	1616	P&A_INJ
35-113-33526	1602	OIL	35-113-33568	1016	PA_PROD
35-113-33527	1002	PA_PROD	35-113-33569	1517	UNKNW
35-113-33528	1503	OIL	35-113-33570	1201	OIL
35-113-33529	1603	OIL	35-113-33571	1701	OIL
35-113-33530	1003	PA_PROD	35-113-33572	1702	OIL
35-113-33531	1504	OIL	35-113-33573	1202	OIL
35-113-33532	1604	OIL	35-113-33574	1102	OIL
35-113-33533	1004	PA_PROD	35-113-33575	1703	OIL
35-113-33534	1505	PA_PROD	35-113-33576	1203	OIL
35-113-33535	1605	PA_PROD	35-113-33577	1103	SI_OIL
35-113-33536	1005	PA_PROD	35-113-33578	1104	OIL
35-113-33537	1506	P&A_INJ	35-113-33579	1704	OIL
35-113-33538	1606W	WAG	35-113-33580	1204	OIL
35-113-33539	1006	P&A_INJ	35-113-33581	1101	PA_PROD
35-113-33540	1607	P&A_INJ	35-113-33582	1705	PA_PROD
35-113-33541	1507	PA_PROD	35-113-33583	1205	P&A_INJ
35-113-33542	1007	PA_PROD	35-113-33584	1105W	WAG
35-113-33543	1508W	WAG	35-113-33585	1706	PA_PROD
35-113-33544	1608	PA_PROD	35-113-33586	1206	PA_PROD
35-113-33545	1008	P&A_INJ	35-113-33587	1106	PA_PROD
35-113-33546	1609	OIL	35-113-33588	1707	P&A_INJ
35-113-33547	1009	OIL	35-113-33589	1207W	P&A_INJ
35-113-33548	1510	P&A_INJ	35-113-33590	1107	P&A_INJ
35-113-33549	1610	OIL	35-113-33591	1208	P&A_INJ
35-113-33550	1010	OIL	35-113-33592	1708	PA_PROD
35-113-33552	1511W	P&A_INJ	35-113-33593	1108	PA_PROD
35-113-33553	1611	PA_PROD	35-113-33594	1109	OIL
35-113-33554	1011	PA_PROD	35-113-33595	1110	OIL
35-113-33555	1612	OIL	35-113-33596	1711	OIL
35-113-33556	1012	OIL	35-113-33597	1211	OIL
35-113-33557	1513	PA_PROD	35-113-33598	1111	OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33599	1112	OIL	35-113-33639	3015	P&A_INJ
35-113-33600	1212	OIL	35-113-33640	3016	P&A_INJ
35-113-33601	1213	PA_PROD	35-113-33641	3817	PA_PROD
35-113-33602	1713	PA_PROD	35-113-33642	4705	PA_PROD
35-113-33602	1713A	WAG	35-113-33643	4901	TA_OIL
35-113-33603	1113	PA_PROD	35-113-33645	4902	PA_PROD
35-113-33604	1714	PA_PROD	35-113-33646	3902	SI_OIL
35-113-33605	1214	P&A_INJ	35-113-33647	3903	TA_OIL
35-113-33606	1114	PA_PROD	35-113-33648	4903	TA_OIL
35-113-33607	1215	PA_PROD	35-113-33649	3904	PA_PROD
35-113-33608	1715W	WAG	35-113-33649	3904A	SI_OIL
35-113-33609	1115	PA_PROD	35-113-33650	4904	PA_PROD
35-113-33610	1716	PA_PROD	35-113-33650	4904A	PA_PROD
35-113-33611	1216	PA_PROD	35-113-33651	4905	P&A_UNKW
35-113-33612	1116	P&A_INJ	35-113-33652	3906	PA_PROD
35-113-33613	1117	P&A_INJ	35-113-33653	4906	P&A_UNKW
35-113-33614	18106W	UNKNW	35-113-33654	3907W	P&A_INJ
35-113-33615	2617	PA_PROD	35-113-33655	4907W	W_INJ
35-113-33616	2401	OIL	35-113-33656	4908	P&A_INJ
35-113-33617	2402	OIL	35-113-33659	3909	OIL
35-113-33618	2403	OIL	35-113-33660	4910	PA_PROD
35-113-33619	2404	OIL	35-113-33660	4910A	TA_OIL
35-113-33620	2405	PA_PROD	35-113-33661	3911	OIL
35-113-33621	2406	P&A_INJ	35-113-33662	4911	SI_OIL
35-113-33622	2407	PA_PROD	35-113-33663	4912	PA_PROD
35-113-33623	2408	P&A_INJ	35-113-33664	3912	OIL
35-113-33624	2409	OIL	35-113-33665	3913	PA_PROD
35-113-33625	2410	OIL	35-113-33666	4913	P&A_INJ
35-113-33626	2411	OIL	35-113-33667	3914	PA_PROD
35-113-33627	2412	OIL	35-113-33668	4914	PA_PROD
35-113-33628	2413	PA_PROD	35-113-33669	3915	PA_PROD
35-113-33629	2414	PA_PROD	35-113-33670	4915	PA_PROD
35-113-33630	2415	P&A_INJ	35-113-33671	3916	PA_PROD
35-113-33630	2415A	WAG	35-113-33672	4916	PA_PROD
35-113-33631	2416	P&A_INJ	35-113-33673	4801	PA_PROD
35-113-33632	3005	P&A_INJ	35-113-33674	4802	P&A_INJ
35-113-33633	3007	PA_PROD	35-113-33674	4802AW	SI_WINJ
35-113-33635	3009	PA_PROD	35-113-33675	4803W	TA_INJ
35-113-33636	3010	PA_PROD	35-113-33676	4804	PA_PROD
35-113-33637	3013	PA_PROD	35-113-33677	4805	SI_OIL
35-113-33638	3014	OIL	35-113-33678	4806W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33679	4807W	P&A_INJ	35-113-33718	5015	OIL
35-113-33680	4808A	OIL	35-113-33719	4215	P&A_INJ
35-113-33681	4809	PA_PROD	35-113-33720	5016	PA_PROD
35-113-33682	4810	TA_OIL	35-113-33721	4216	PA_PROD
35-113-33683	4811	PA_PROD	35-113-33722	4117	PA_PROD
35-113-33684	4812	PA_PROD	35-113-33723	6701	PA_PROD
35-113-33685	4813W	TA_INJ	35-113-33724	6601	P&A_INJ
35-113-33686	4814W	SI_WINJ	35-113-33725	5901	SI_OIL
35-113-33687	4815W	P&A_INJ	35-113-33726	5801W	W_INJ
35-113-33688	4816W	W_INJ	35-113-33727	5902	PA_PROD
35-113-33689	3910	OIL	35-113-33728	6702	P&A_INJ
35-113-33690	5001	SI_OIL	35-113-33729	6602	PA_PROD
35-113-33691	4201	PA_PROD	35-113-33731	5802W	SI_WINJ
35-113-33691	4201A	TA_OIL	35-113-33732	6703	OIL
35-113-33692	5002W	W_INJ	35-113-33733	5903	PA_PROD
35-113-33693	4202	PA_PROD	35-113-33734	6603W	SI_WINJ
35-113-33693	4202A	TA_OIL	35-113-33735	5803	PA_PROD
35-113-33694	5003	PA_PROD	35-113-33736	5804	PA_PROD
35-113-33695	4203	TA_OIL	35-113-33737	6704	SI_OIL
35-113-33696	5004	SI_OIL	35-113-33738	5904	PA_PROD
35-113-33697	4204	PA_PROD	35-113-33739	6604	PA_PROD
35-113-33698	4205	PA_PROD	35-113-33740	6705	PA_PROD
35-113-33699	5005	PA_PROD	35-113-33741	6705A	PA_PROD
35-113-33700	5006	TA_OIL	35-113-33742	6605	PA_PROD
35-113-33701	4206	P&A_INJ	35-113-33743	5905	PA_PROD
35-113-33702	5007	PA_PROD	35-113-33744	5805	PA_PROD
35-113-33703	4207	PA_PROD	35-113-33745	6706	PA_PROD
35-113-33704	5028W	SI_WINJ	35-113-33746	6606	SI_OIL
35-113-33705	4208	PA_PROD	35-113-33747	5906	PA_PROD
35-113-33706	5009	OIL	35-113-33748	5806	SI_OIL
35-113-33707	4209	PA_PROD	35-113-33749	6707	OIL
35-113-33708	5010	PA_PROD	35-113-33750	5907	P&A_INJ
35-113-33709	4210	SI_OIL	35-113-33751	6607	SI_OIL
35-113-33710	5011W	SI_WINJ	35-113-33752	5807	SI_OIL
35-113-33711	4211	PA_PROD	35-113-33753	5808	P&A_INJ
35-113-33712	5012	TA_OIL	35-113-33754	5908	SI_OIL
35-113-33713	4212	PA_PROD	35-113-33755	6608	SI_OIL
35-113-33714	5013	PA_PROD	35-113-33756	6709	PA_PROD
35-113-33715	4213	PA_PROD	35-113-33757	6609W	P&A_INJ
35-113-33716	5014	P&A_INJ	35-113-33758	5909	PA_PROD
35-113-33717	4214	PA_PROD	35-113-33759	5809	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33760	6710	SI_OIL	35-113-33800	5713	PA_PROD
35-113-33761	6610	PA_PROD	35-113-33801	5714	P&A_INJ
35-113-33762	5910	SI_OIL	35-113-33802	5703	OIL
35-113-33763	5810	PA_PROD	35-113-33803	6510	PA_PROD
35-113-33764	5811	SI_OIL	35-113-33804	6512	SI_OIL
35-113-33765	6711	PA_PROD	35-113-33805	5712	SI_OIL
35-113-33766	5911	SI_OIL	35-113-33806	6513W	W_INJ
35-113-33767	6712	PA_PROD	35-113-33807	5715	PA_PROD
35-113-33768	5912	PA_PROD	35-113-33808	6401	P&A_INJ
35-113-33769	5812	SI_OIL	35-113-33809	6402	SI_OIL
35-113-33770	5913	PA_PROD	35-113-33810	6403	PA_PROD
35-113-33771	6713	PA_PROD	35-113-33811	6404	P&A_INJ
35-113-33772	5813	PA_PROD	35-113-33812	6405W	P&A_INJ
35-113-33773	6714	P&A_INJ	35-113-33813	6406	PA_PROD
35-113-33774	5914	PA_PROD	35-113-33814	5601	PA_PROD
35-113-33775	5814W	W_INJ	35-113-33815	5602W	P&A_INJ
35-113-33776	5915	P&A_INJ	35-113-33816	5603	PA_PROD
35-113-33777	6715	PA_PROD	35-113-33817	5604	PA_PROD
35-113-33778	5815	SI_OIL	35-113-33818	5605W	SI_WINJ
35-113-33779	6716	PA_PROD	35-113-33819	5606	PA_PROD
35-113-33780	5916	PA_PROD	35-113-33820	5607	SI_OIL
35-113-33781	5816	DRY	35-113-33821	5608	OIL
35-113-33782	6501	SI_WINJ	35-113-33822	5609	OIL
35-113-33783	5701	SI_OIL	35-113-33823	5610W	P&A_INJ
35-113-33784	6502	PA_PROD	35-113-33824	5611	SI_SWD
35-113-33785	5702	OIL	35-113-33828	7401	SI_OIL
35-113-33786	6503	PA_PROD	35-113-33829	7402	SI_OIL
35-113-33786	6503A	PA_PROD	35-113-33830	7403	SI_OIL
35-113-33787	6504	PA_PROD	35-113-33831	7404	PA_PROD
35-113-33788	5704	SI_OIL	35-113-33832	7405	P&A_INJ
35-113-33789	6505	SI_OIL	35-113-33833	7406	SI_OIL
35-113-33790	5705	PA_PROD	35-113-33834	7407	PA_PROD
35-113-33791	6506	SI_OIL	35-113-33835	7408	SI_OIL
35-113-33792	5706	PA_PROD	35-113-33836	7410	PA_PROD
35-113-33793	5707	PA_PROD	35-113-33837	7411	PA_PROD
35-113-33794	6508	SI_OIL	35-113-33838	7412	PA_PROD
35-113-33795	5708	PA_PROD	35-113-33839	7301	PA_PROD
35-113-33796	6509	SI_OIL	35-113-33840	7302A	SI_OIL
35-113-33797	5709	SI_OIL	35-113-33841	7303	PA_PROD
35-113-33798	5710	PA_PROD	35-113-33842	7304	PA_PROD
35-113-33799	6511	OIL	35-113-33843	8201	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33844	8309	SI_OIL	35-113-33896	2904	PA_PROD
35-113-33845	8312	SI_OIL	35-113-33897	2911	PA_PROD
35-113-33846	8313	PA_PROD	35-113-33898	2912	PA_PROD
35-113-33848	8401	PA_PROD	35-113-33899	3701	PA_PROD
35-113-33849	8402	PA_PROD	35-113-33900	3702	SI_OIL
35-113-33850	8503	SI_OIL	35-113-33902	3601	PA_PROD
35-113-33851	8414	PA_PROD	35-113-33903	3602	PA_PROD
35-113-33856	8409	PA_PROD	35-113-33904	3603	PA_PROD
35-113-33857	8410	PA_PROD	35-113-33905	3604	PA_PROD
35-113-33858	8411	PA_PROD	35-113-33906	3605	SI_OIL
35-113-33859	8412	P&A_INJ	35-113-33907	3606	SI_OIL
35-113-33860	8413	PA_PROD	35-113-33908	3607	PA_PROD
35-113-33861	8414	PA_PROD	35-113-33909	3608	PA_PROD
35-113-33862	8415	PA_PROD	35-113-33910	3609	P&A_INJ
35-113-33863	8416	PA_PROD	35-113-33912	3611	SI_OIL
35-113-33864	8417	PA_PROD	35-113-33913	3612	PA_PROD
35-113-33865	7506	PA_PROD	35-113-33914	3613	PA_PROD
35-113-33866	7616W	SI_WINJ	35-113-33915	3614	PA_PROD
35-113-33867	7501W	P&A_INJ	35-113-33916	2707	PA_PROD
35-113-33868	7502W	W_INJ	35-113-33917	2713	PA_PROD
35-113-33869	7503W	P&A_INJ	35-113-33918	2714	TA_OIL
35-113-33870	7513W	W_INJ	35-113-33919	2715	PA_PROD
35-113-33871	7601W	W_INJ	35-113-33920	2716	PA_PROD
35-113-33872	7602W	P&A_INJ	35-113-33921	2802	PA_PROD
35-113-33873	7603W	P&A_INJ	35-113-33922	2803	PA_PROD
35-113-33874	7604	SI_OIL	35-113-33923	2804	PA_PROD
35-113-33875	7604W	W_INJ	35-113-33924	2805	PA_PROD
35-113-33876	8401W	SI_WINJ	35-113-33925	2806W	P&A_INJ
35-113-33877	8402W	P&A_INJ	35-113-33926	2807	PA_PROD
35-113-33878	8403W	W_INJ	35-113-33927	2808	PA_PROD
35-113-33886	2901	PA_PROD	35-113-33928	2809	PA_PROD
35-113-33887	2902	PA_PROD	35-113-33930	2811	PA_PROD
35-113-33888	2903	PA_PROD	35-113-33931	2812	PA_PROD
35-113-33889	2905	PA_PROD	35-113-33932	2813	PA_PROD
35-113-33890	2906	SI_OIL	35-113-33933	2814	PA_PROD
35-113-33891	2907	PA_PROD	35-113-33934	2815	PA_PROD
35-113-33892	2908	PA_PROD	35-113-33935	2816	PA_PROD
35-113-33893	2909	P&A_INJ	35-113-33936	5201	OIL
35-113-33894	2910	PA_PROD	35-113-33937	5202	OIL
35-113-33895	2913	PA_PROD	35-113-33938	5203	P&A_INJ
35-113-33895	2913A	PA_PROD	35-113-33939	5204	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33941	5206	PA_PROD	35-113-34015	6004	PA_PROD
35-113-33942	5207	PA_PROD	35-113-34016	6005	SI_OIL
35-113-33943	5209	OIL	35-113-34017	6006	PA_PROD
35-113-33944	5212	PA_PROD	35-113-34018	6007	PA_PROD
35-113-33945	5213A	DRY	35-113-34019	6008	PA_PROD
35-113-33946	5213	DRY	35-113-34020	6009	PA_PROD
35-113-33947	5214	PA_PROD	35-113-34021	6010	PA_PROD
35-113-33948	5215	PA_PROD	35-113-34022	6011	PA_PROD
35-113-33949	5216	P&A_INJ	35-113-34023	6012	PA_PROD
35-113-33950	5208	PA_PROD	35-113-34024	6013	PA_PROD
35-113-33951	5210	P&A_INJ	35-113-34025	6014	PA_PROD
35-113-33952	5211	OIL	35-113-34026	6015	P&A_INJ
35-113-33953	4416	PA_PROD	35-113-34027	6016	PA_PROD
35-113-33954	5501	PA_PROD	35-113-34028	6017	PA_PROD
35-113-33955	5502	PA_PROD	35-113-34029	7701W	P&A_INJ
35-113-33956	5503	PA_PROD	35-113-34030	7702W	W_INJ
35-113-33957	4502	PA_PROD	35-113-34031	7703W	P&A_INJ
35-113-33958	4503	PA_PROD	35-113-34032	7704W	W_INJ
35-113-33959	5504	PA_PROD	35-113-34033	7705W	W_INJ
35-113-33960	4504	PA_PROD	35-113-34034	7708W	P&A_INJ
35-113-33961	5505	PA_PROD	35-113-34035	7801W	W_INJ
35-113-33962	4505	PA_PROD	35-113-34036	7802W	P&A_INJ
35-113-33963	546	PA_PROD	35-113-34037	7803W	P&A_INJ
35-113-33964	4506	PA_PROD	35-113-34038	7804W	P&A_INJ
35-113-33965	5507	PA_PROD	35-113-34039	7805W	SI_WINJ
35-113-33966	4507	SI_OIL	35-113-34040	7806W	P&A_INJ
35-113-33968	5408	PA_PROD	35-113-34042	7808W	P&A_INJ
35-113-33999	6301	PA_PROD	35-113-34043	8601W	P&A_INJ
35-113-34000	6302	PA_PROD	35-113-34044	8603W	P&A_INJ
35-113-34001	6303	PA_PROD	35-113-34045	8604W	P&A_INJ
35-113-34002	6304	PA_PROD	35-113-34046	8701W	W_INJ
35-113-34003	6305	PA_PROD	35-113-34047	8702W	P&A_INJ
35-113-34004	6306	PA_PROD	35-113-34048	8703W	W_INJ
35-113-34005	6307	P&A_INJ	35-113-34049	8704W	P&A_INJ
35-113-34007	6309	PA_PROD	35-113-34050	8705W	P&A_INJ
35-113-34008	6310	PA_PROD	35-113-34051	8706W	W_INJ
35-113-34009	6311	PA_PROD	35-113-34052	8707W	P&A_INJ
35-113-34010	6312	PA_PROD	35-113-34053	8708W	W_INJ
35-113-34011	6313	P&A_INJ	35-113-34054	7901W	P&A_INJ
35-113-34012	6001A	PA_PROD	35-113-34055	7902W	SI_WINJ
35-113-34014	6003	PA_PROD	35-113-34056	7903W	W_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-34057	7907W	SI_WINJ	35-113-36899	4601	PA_PROD
35-113-34058	8001W	SI_WINJ	35-113-36901	6002	PA_PROD
35-113-34059	8002W	SI_WINJ	35-113-36902	5205	PA_PROD
35-113-34060	8003W	P&A_INJ	35-113-36903	9906	PA_PROD
35-113-34061	8004W	P&A_INJ	35-113-36904	12210	PA_PROD
35-113-34062	8005W	SI_WINJ	35-113-36906	8001	PA_PROD
35-113-34063	8006W	P&A_INJ	35-113-36907	8002	PA_PROD
35-113-34064	8007AW	SI_WINJ	35-113-36964	7807W	P&A_INJ
35-113-34065	8008W	SI_WINJ	35-113-36965	7708A	PA_PROD
35-113-34066	8801W	P&A_INJ	35-113-37061	6701W	W_INJ
35-113-34067	8802W	P&A_INJ	35-113-37070	4525W	P&A_INJ
35-113-34068	8803W	SI_WINJ	35-113-37072	612	PA_PROD
35-113-34069	8804W	P&A_INJ	35-113-37072	612A	OIL
35-113-34070	8805W	SI_WINJ	35-113-37073	306	SI_OIL
35-113-34071	8806W	SI_WINJ	35-113-37075	1628W	P&A_INJ
35-113-34072	8901W	P&A_INJ	35-113-37080	2504A	OIL
35-113-34073	8902W	SI_WINJ	35-113-37082	6408	SI_OIL
35-113-34074	6001	SI_OIL	35-113-37083	2516	SI_OIL
35-113-34075	8903W	SI_WINJ	35-113-37083	2516A	OIL
35-113-34076	8904W	SI_WINJ	35-113-37102	12512	PA_PROD
35-113-34077	8908W	SI_WINJ	35-113-37105	9602W	P&A_INJ
35-113-34078	8817	DRY	35-113-37107	10910	SI_OIL
35-113-34079	7917	PA_PROD	35-113-37108	10914	PA_PROD
35-113-34080	14306	SI_OIL	35-113-37111	1824W	P&A_INJ
35-113-34081	8101W	P&A_INJ	35-113-37112	1228W	W_INJ
35-113-34082	8102W	P&A_INJ	35-113-37115	8302W	P&A_INJ
35-113-34083	8103W	P&A_INJ	35-113-37116	8322	UNKNW
35-113-34084	8105W	P&A_INJ	35-113-37117	8303	P&A_INJ
35-113-34085	9001W	P&A_INJ	35-113-37118	7304W	SI_WINJ
35-113-34086	9002W	P&A_INJ	35-113-37119	7405W	P&A_INJ
35-113-34087	9003W	P&A_INJ	35-113-37120	7406W	P&A_INJ
35-113-34088	9005W	P&A_INJ	35-113-37121	7407W	P&A_INJ
35-113-34089	8113	PA_PROD	35-113-37136	7505W	P&A_INJ
35-113-34090	8114	PA_PROD	35-113-37137	7605W	P&A_INJ
35-113-34091	8116	PA_PROD	35-113-37138	7506W	P&A_INJ
35-113-36813	9106	PA_PROD	35-113-37139	7507W	P&A_INJ
35-113-36894	10113	PA_PROD	35-113-37140	7608W	P&A_INJ
35-113-36894	10113A	SI_OIL	35-113-37142	7514	SI_OIL
35-113-36895	13805	SI_OIL	35-113-37151	2023W	P&A_INJ
35-113-36895	13805W	P&A_INJ	35-113-37152	12922	SI_OIL
35-113-36897	5309	PA_PROD	35-113-37172	339	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-37172	2509	OIL	35-113-41951	3329W	WAG
35-113-37172	3309	SI_OIL	35-113-41952	2629D	SI_SWD
35-113-37779	8W	P&A_INJ	35-113-41975	4429D	SWD
35-113-37780	12416AW	P&A_INJ	35-113-42088	5724W	W_INJ
35-113-37781	12901	P&A_INJ	35-113-42089	5725	OIL
35-113-37782	13116	PA_PROD	35-113-42090	5726	SI_OIL
35-113-37783	13004	PA_PROD	35-113-42091	5727	OIL
35-113-37784	13110A	SI_OIL	35-113-42092	3928	OIL
35-113-37785	13012W	SI_OIL	35-113-42093	4828	SI_WINJ
35-113-37851	501	OIL	35-113-42095	4928W	W_INJ
35-113-37852	1709	OIL	35-113-42096	3929	SI_WINJ
35-113-37853	1710	OIL	35-113-42097	4929	SI_OIL
35-113-37854	1712	PA_PROD	35-113-42098	4930	OIL
35-113-37856	2515	PA_PROD	35-113-42100	4932W	SI_WINJ
35-113-37858	8703	PA_PROD	35-113-42101	4933W	W_INJ
35-113-37867	504	OIL	35-113-42126	5129W	SI_WINJ
35-113-37874	511	PA_PROD	35-113-42139	4829	SI_OIL
35-113-37874	511A	OIL	35-113-42139	4929C	P&A_UNKW
35-113-37887	8409	PA_PROD	35-113-42142	13818W	P&A_INJ
35-113-37889	13106W	P&A_INJ	35-113-42357	5710A	SI_OIL
35-113-37904	10102W	P&A_INJ	35-113-42368	14008W	SI_WINJ
35-113-37905	9416W	P&A_INJ	35-113-43099	4931	SI_OIL
35-113-37906	3328W	WAG	35-113-43565	509	OIL
35-113-37907	7905W	W_INJ	35-113-43596	510	OIL
35-113-37965	1424W	WAG	35-113-43597	512	OIL
35-113-37986	8501	PA_PROD	35-113-43598	802	OIL
35-113-37987	7402W	SI_WINJ	35-113-43599	3201	OIL
35-113-37988	7401W	P&A_INJ	35-113-43601	5232W	W_INJ
35-113-38019	506W	WAG	35-113-43603	6612	OIL
35-113-41342	11127	OIL	35-113-43604	8605	SI_OIL
35-113-41908	5231D	SI_SWD	35-113-43605	6112	SI_OIL
35-113-41909	4228W	SI_WINJ	35-113-43606	9719	SI_OIL
35-113-41910	5128W	W_INJ	35-113-43607	9726W	W_INJ
35-113-41944	5133W	W_INJ	35-113-43608	9727W	SI_WINJ
35-113-41945	5031D	SI_SWD	35-113-43609	9737W	SI_WINJ
35-113-41946	5029W	SI_WINJ	35-113-43610	13107	OIL
35-113-41947	4230AW	SI_WINJ	35-113-43611	14004	SI_OIL
35-113-41947	4230W	P&A_INJ	35-113-43612	1901	PA_PROD
35-113-41948	4229W	W_INJ	35-113-43612	1901A	SI_OIL
35-113-41949	3428W	W_INJ	35-113-43613	1902	SI_OIL
35-113-41950	3430WS	SI_WSW	35-113-43614	1910	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status
35-113-43615	1512	OIL
35-113-43616	12607	OIL
35-113-43617	12714	SI_OIL
35-113-43875	1441W	W_INJ
35-113-43877	3141W	WAG
35-113-43878	4041W	WAG
35-113-43879	3941W	WAG
35-113-43892	2341W	WAG
35-113-43893	2441W	WAG
35-113-43894	3142W	WAG
35-113-43904	2241W	W_INJ
35-113-43924	4042W	WAG
35-113-43963	1741W	WAG
35-113-44124	1541	OIL
35-113-44125	1542	OIL
35-113-44126	2442W	WAG
35-113-44213	3942W	W_INJ
35-113-44214	4043W	W_INJ
35-113-44320	3241W	WAG
35-113-44465	2541W	WAG
35-113-44466	3341W	WAG
35-113-44467	3841W	W_INJ
35-113-44468	2242W	W_INJ
35-113-44616	3242	OIL
35-113-44617	3143W	WAG
35-113-44670	2342	OIL
35-113-44697	2343	OIL
35-113-44864	541W	WAG
35-113-44866	642W	WAG
35-113-44874	1044	OIL
35-113-44878	1641	OIL
35-113-44885	942	OIL
35-113-44889	941	OIL
35-113-44918	2344	OIL
35-113-44926	842W	W_INJ
35-113-44927	1042	OIL
35-113-44928	1041	OIL
35-113-44931	943	OIL
35-113-44932	2542W	WAG
35-113-44933	1141WR	WAG
35-113-44936	1742W	WAG

API Number	Well Name and Well #	Well Type and Well Status
35-113-45252	452W	WAG
35-113-45291	852W	W_INJ
35-113-45292	2255	W_INJ
35-113-45293	3357W	WAG
35-113-45294	1855W	WAG
35-113-45315	1257W	W_INJ
35-113-45316	1748	OIL
35-113-45317	1853W	WAG
35-113-45318	1857W	WAG
35-113-45319	3052W	W_INJ
35-113-45321	3457W	W_INJ
35-113-45322	741	OIL
35-113-45332	2657W	WAG
35-113-45367	742	OIL
35-113-45369	3448	TA_OIL
35-113-45390	3453W	W_INJ
	3513AW	WAG_TBD
	3513AW	WAG_TBD
	3602AW	WAG_TBD
	5002AW	WAG_TBD
	5225AW	WAG_TBD
	5306AW	WAG_TBD
	5308AW	WAG_TBD
	5313AW	WAG_TBD
	5402AW	WAG_TBD
	5407AW	WAG_TBD
	5707AW	WAG_TBD
	5715AW	WAG_TBD
	5727AW	WAG_TBD
	5801AW	WAG_TBD
	5803AW	WAG_TBD
	5813AW	WAG_TBD
	5903AW	WAG_TBD
	5912AW	WAG_TBD
	5914AW	WAG_TBD
	5927AW	WAG_TBD
	6021AW	WAG_TBD
	6025AW	WAG_TBD
	6125AW	WAG_TBD
	6205AW	WAG_TBD
	6207AW	WAG_TBD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
	6209AW	WAG_TBD		6213AW	WAG_TBD

Request for Additional Information: North Burbank Unit (NBU)
September 1, 2020

Instructions: Please enter responses into this table. Any long responses, references, or supplemental information may be attached to the end of the table as an appendix. Supplemental information may also be provided in a resubmitted MRV plan.

No.	MRV Plan		EPA Questions	Responses by Perdure September 17, 2020
	Section	Page		
1.	Multiple	2, 26, 27, 34	(pg. 2) "…the rules and regulations in Subpart W will inform the activities described in this MRV Plan..." (pg. 26) "…Perdure will reconcile any Subpart W report[26] and results from any event-driven quantification to assure that surface leaks are not counted multiple times…" But footnote 26 says "…Monitoring and QA/QC procedures specified in Subpart W will be used to estimate surface leaks from equipment in the NBU…" (pg. 27) "…If it is a simple matter, the repair would be accomplished, and the volume of leaked CO2 would be included in any Subpart W report for the NBU…" (pg. 34) "… In addition, reports under GHGRP Subpart W will be taken into consideration and will be reconciled to ensure that surface leakage of CO2 emissions is not double counted." Reporting under Subpart W is mentioned several times in the MRV Plan for the NBU. However, the NBU currently does not appear to be reporting under Subpart W, presumably because the facility falls below the threshold for subpart W reporting. Do you expect to report under Subpart W once reporting under Subpart RR begins? Or will Subpart W methods and procedures be used to calculate emissions, if the emissions from the NBU fall below the threshold for Subpart W reporting? Please clarify.	The emissions from the field associated with the NBU have historically not met or exceeded the Subpart W reporting threshold. Because Perdure believes this historical trend will continue, Perdure does not anticipate reporting under Subpart W for the field associated with the NBU. In the event emissions from the field associated with the NBU trigger a reporting requirement under Subpart W, Perdure will comply with Subpart W regulations. For purposes of the NBU MRV Plan, certain Subpart W methodologies will be utilized for certain emission calculations regardless of whether Subpart W reporting is required by regulation. The clarifications provided in this response have been made in the MRV Plan in all instances in which Subpart W is mentioned.

No.	MRV Plan		EPA Questions	Responses by Perdure September 17, 2020
	Section	Page		
2.	Multiple	1, 32, 33, 34	In the plan, there is a statement that says "Section 7 provides the site-specific modifications to the mass balance equations…" (page 1), and "…All delivery of CO2 to the NBU is currently used within the NBU and not redelivered outside of the NBU, so quarterly flow redelivered, Sr,p, is zero ("0") and will not be included in the equation during the time period of that operation…" (page 32). Modification to equations is not allowed under the GHGRP. Is your plan to modify certain equations, or is the plan for certain terms in the equations to be equal to zero? Please clarify.	Our plan is for certain terms in the equations in the MRV Plan to be equal to zero. Changes to page 1 and 32 have been made to increase clarity on this point.

No.	MRV Plan		EPA Questions	Responses by Perdure September 17, 2020
	Section	Page		
3.	Multiple	9-10, 17	"Operationally, the reservoir boundaries of the NBU are maintained with a "water curtain". Because of the WCI operations employed at the NBU unit boundaries, injected fluids (including CO2) stay in the reservoir within the NBU unit boundary and do not move to adjacent areas. The CO2 stored in the NBU will fill approximately 46.7% of the total calculated storage capacity of the reservoir. As a result, there is more than enough pore space to retain the projected amount of stored CO2." As EPA understands it, one key objective of the Water Curtain Injection (WCI) is to ensure pattern balancing and active reservoir management, which is key to reservoir monitoring under the plan. This balancing appears instrumental in ensuring that pattern pressures are in harmony with WCI pressures, which means no movement either way on the water curtain. This does not appear to be discussed. The role of the WCI to contain the CO2 (from crossing pattern development areas or property lines or for other reasons), however, is discussed. Therefore, it would be useful to see more elaboration on the discussion of the WCI operation. Specifically, it would be useful to know: (1) What happens if operations go astray (such as that described historically on p. 17)? (2) What happens if/when WCI operations end? Would CO_2 containment be affected if the water curtain fails to keep the fluids within the boundary of the NBU?	Historically, the EOR flood at the NBU had active waterflood patterns on the western flank as a "curtain" to insure CO_2 containment in the unit area. These were two columns of 5 spot patterns. The positive drawdown from the pattern's producing wells however was encouraging CO_2 migration towards the northwest flank of the field. In addition, non-unit production farther to the northwest and down dip complicated the pattern balancing. Since 2018 Perdure has been modifying this "curtain" to a water injection only barrier, avoiding this drawdown from producers and has limited production from downdip wells. This is a simpler and more effective barrier system. Furthermore, the reservoir stratigraphically pinchs out to the east and southwest and thus those areas will not require a "Water Curtain". If the barrier is ineffective to any degree and the CO_2 injected during the specified period migrates in a manner so as to lead to a release at the surface, the amount of CO_2 will be accounted for as described in Section 4.6 of the MRV Plan. The Water Curtain Injection operations are only required when there are dynamic conditions such as injection and withdrawal from the reservoir. When active operations end the CO_2 plume will be governed by gravity (and stop migrating downdip). The MRV Plan has been amended in Sections 2.3 and 4.6 to address these questions. Estimation of potential leakage is also addressed in Section 5.5.1.

No.	MRV Plan		EPA Questions	Responses by Perdure September 17, 2020
	Section	Page		
4.	Multiple	15, 19, 29	The well counts reported for the NBU are not consistent throughout. On page 15 and 19, 439 active wells (240 producers and 191 injectors) are reported. On page 15 and page 29, 467 total wells are reported. Is the 28 well count difference due to the WAG TBD wells listed in the appendices? Please clarify.	The number of wells, including active wells, production wells and injection wells, has been updated throughout the MRV Plan. The WAG TBD well count is not in any of the referenced well counts.
5.	1.3	2	The API numbers for the injection wells in the NBU, as of January 1, 2019, are listed in Appendix 1. The sentence above refers to "Appendix 1", but the appendices do not match this naming convention. Please update the reference to be consistent with the applicable appendix title.	The reference to the Appendix has been updated to refer to Section 12.6.
6.	2.5.2	15	The text in the legend on Figure 11 (page 15) is small enough that much of it is unreadable. If possible, please replace with a larger or more readable legend.	Figure 11 has been replaced with an image of increased clarity, including a larger legend.
7.	2.5.3	16	The CO2 at the outlet of the RCF is transported to the injection system described in Section 3.3.1 above. Should the section be 2.5.1?	Yes. The reference has been updated to Section 2.5.1 in the MRV Plan.
8.	4.1	19	The regulations establish the requirements with which all wells **much comply**, whether they are injection, production or disposal wells. Should this read "…**must comply**"?	Yes. The sentence has been amended in the MRV Plan.

<table>
<tr><th rowspan="2">No.</th><th colspan="2">MRV Plan</th><th rowspan="2">EPA Questions</th><th rowspan="2">Responses by Perdure September 17, 2020</th></tr>
<tr><th>Section</th><th>Page</th></tr>
<tr><td>9.</td><td>4.1</td><td>19-20</td><td>Perdure well completion practices are discussed for “new wells,” where these wells “… are designed to be cemented all the way from the formation to the surface…”

Please elaborate as to what portion of the wells within the NBU are constructed to the “new well” specifications, and correspondingly what portion were constructed to more traditional standards, and thus not cemented to the surface.</td><td>As of January 1, 2020, approximately 17 of the active completed wells have been constructed to the new well specifications, and 100% of the new wells that have been drilled since Perdure took over operations of the NBU in 2017 have been drilled in this manner. Section 4.1 of the MRV Plan has been updated accordingly.</td></tr>
<tr><td>10.</td><td>4.3</td><td>21-22</td><td>“…Osage County as an anomalously “quiet” region.”

“Therefore, there is no direct evidence to suggest that natural seismic activity poses a significant risk for loss of CO2 to the surface from the NBU. If induced seismicity resulted in a pathway for material amounts of CO2 to migrate from the injection zone, then other reservoir fluid monitoring methods (such as reservoir pressure, well pressure and pattern monitoring) would lead to further investigation.”

Please elaborate on the discussion related to seismic activity. For example, some previous seismicity in the state could be related to injection near basement rock. Will the facility avoid this type of injection? Furthermore, there may be efforts at the state level to monitor, detect, identify, model and mitigate injection activities. Are you aware of any trends in seismic activity that are relevant to this MRV plan?</td><td>The MRV Plan contains additional information regarding induced seismicity from produced water injection into the Arbuckle formation in areas of the state where the Arbuckle contacts the crystalline basement. There are very few if any of the earthquakes in Osage County, and Perdure does not inject CO_2 into the Arbuckle formation or in a formation adjacent to the crystalline basement. The additional information also demonstrates that the Arbuckle formation is much deeper than the CO_2 injection reservoir in the NBU unit boundary, and the Arbuckle is not directly above the basement rock in the NBU unit boundary. Perdure’s injection of CO_2 also serves to maintain pressure in the reservoir since other fluids are produced from the reservoir, which is very different from a disposal operation of constantly injecting produced water without any other fluid production. Section 4.3 has been updated accordingly.</td></tr>
<tr><td>11.</td><td></td><td>35</td><td>This plan will be effective as of January 1, 2019, which is also the proposed date for beginning to collect data under this plan.

Should this read “This plan will be effective as of January 1, 2020.”?</td><td>Yes. The MRV Plan is proposed to be effective as of January 1, 2020. Section 8 of the MRV Plan has been updated accordingly.</td></tr>
</table>

North Burbank Unit (NBU)
CO_2 Monitoring, Reporting, and Verification (MRV) Plan

Perdure Petroleum

August 1, 2020

Table of Contents

Introduction

Perdure Petroleum LLC (Perdure) operates the North Burbank Unit (NBU) located near Shidler, Oklahoma for the primary purpose of enhanced oil recovery (EOR) using carbon dioxide (CO_2) with a subsidiary or ancillary purpose of geologic sequestration of CO_2 in a subsurface geologic formation. Perdure has been operating the NBU since 2017. Perdure acquired the NBU from Chaparral Energy LLC, which initiated the CO_2-EOR project in 2013. Perdure intends to continue CO_2-EOR operations until the end of the economic life of the CO_2-EOR program.

Perdure has developed this monitoring, reporting and verification (MRV) plan in accordance with the rules and regulations in Subpart RR of the Mandatory Greenhouse Gas Reporting Program, 40 CFR Sections 98.440-98.449,[1] to provide for the monitoring, reporting and verification of geologic sequestration in the Burbank reservoir during the injection period in the geographic area defined as the unit boundary of the NBU. This MRV Plan meets the requirements of Section 98.440(c)(1).

This MRV Plan contains the following 12 sections:

- Section 1 contains facility information.
- Section 2 contains the project description. This section estimates the years of CO_2 injection, provides the estimated tons of CO_2 to be injected and stored at the NBU, describes the geology of the NBU, details the operational history of the NBU, and provides an overview of the injection program and project facilities. This section also demonstrates the suitability for secure geologic storage in the reservoir.
- Section 3 contains the delineation of the monitoring areas.
- Section 4 evaluates the potential leakage pathways and demonstrates that the risk of CO_2 leakage through the identified pathways is minimal.
- Section 5 provides information on the detection, verification and quantification of leakage. Leakage detection incorporates several monitoring programs, each of which are described. Detection efforts will be focused towards managing potential leaks through the injection wells and surface equipment due to the improbability of leaks through the seal or faults and fractures.
- Section 6 describes the determination of expected baselines to identify excursions from expected performance that could indicate CO_2 leakage.
- Section 7 provides the site-specific modifications to the mass balance equations and the methodology for calculating volumes of CO_2 stored or sequestered.
- Section 8 provides the estimated schedule for implementation of the MRV Plan.
- Section 9 describes the quality assurance program.

[1] Any "Subpart" referenced in this Plan is a subpart of 40 CFR Part 98, and any reference in this Plan to a "Section 98.xxx" refers to that section in 40 CFR Part 98.

- Section 10 describes some methods for revising this MRV Plan.
- Section 11 describes the records retention process.
- Section 12 includes several Appendices.

In addition to complying with the rules and regulations in Subpart RR for the monitoring, reporting and verification of geologic sequestration in the reservoir during the injection period in the geographic area defined as the NBU, the rules and regulations in Subpart W will inform the activities described in this MRV Plan.

1. Facility Information

1.1. Reporter Number

The North Burbank Unit facility reports under Greenhouse Gas Reporting Program Identification number 553337. The facility is located at or near 36.82491, -96.73257, Webb City, Oklahoma.

1.2. UIC permit class: Class II

The NBU is located in Osage County, Oklahoma. While the Oklahoma Corporation Commission regulates oil and gas activities in 76 of the 77 counties in Oklahoma, the UIC program for Osage County, Oklahoma is different. For purposes of the Environmental Protection Agency (EPA) Underground Injection Control (UIC) program, UIC Class II wells for the Osage Mineral Estate are permitted pursuant to 40 CFR Part 147 Subpart GGG Sections 147.2901-147.2929.[2] As a result of these regulations, UIC Class II permits in the Osage Mineral Estate are regulated by the Osage UIC office, as well as the EPA Region 6 Administrator. All of the injection wells in the NBU are classified as UIC Class II wells under these regulations.

1.3. UIC injection well identification numbers

Wells in the NBU are identified by name and API number. The API numbers for the injection wells in the NBU, as of January 1, 2019, are listed in Appendix 1. Any new wells in the NBU will be indicated in the annual report.

2. Project Description

Perdure exclusively operates all wells within the North Burbank Unit (NBU), which produces oil (and sometimes gas) from the geologic reservoir. Numerous aspects of the geology, facilities, equipment, and operational procedures are similar throughout the NBU. Because of these similarities, one MRV Plan is being prepared for the entire NBU. This section describes the geologic setting and characteristics of the NBU, the estimated years of CO_2 injection, the tons of CO_2 to be injected and stored at the NBU, and the injection process and CO_2-EOR project facilities.

[2] All of the mineral estate in the 1.47 million-acre Osage County, including the oil, gas and other subsurface minerals in Osage County, is known as the Osage Mineral Estate. According to the Osage Allotment Act of June 28, 1906, the United States holds title to the Osage Mineral Estate in trust for the Osage Nation, which is the beneficial owner of the Osage Mineral Estate.

2.1. Estimated years of CO_2 injection

A long-term performance forecast for the NBU has been conducted using the reservoir modeling approaches described in Section 4.1 below. In general, that forecast includes the estimated years of CO_2 injection and the estimated amounts of CO_2 anticipated to be injected and stored in the NBU as a result of current and planned CO_2-EOR operations during the modeling period, based on historic and predicted data. The forecast is based on results from a reservoir model that is used to develop injection plans for each injection pattern. This forecast is merely that: a forecast or prediction; actual data will be collected, assessed and reported as described in other portions of this MRV Plan to demonstrate the tons of CO_2 injected and stored at the NBU. The receipt and injection of CO_2 into the NBU commenced in 2013 and has continued since that time. The forecast anticipates that CO_2 will continue to be received at the NBU until at least 2060.

Figure 1 is a visual representation of a portion of the long-term performance forecast. Figure 1 reflects the actual (historic) amount of CO_2 injection and stored volumes in the NBU for the period beginning in 2013 when CO_2-EOR flooding was commenced in the NBU through 2019, as well as the projected tons to be injected and stored through 2040.

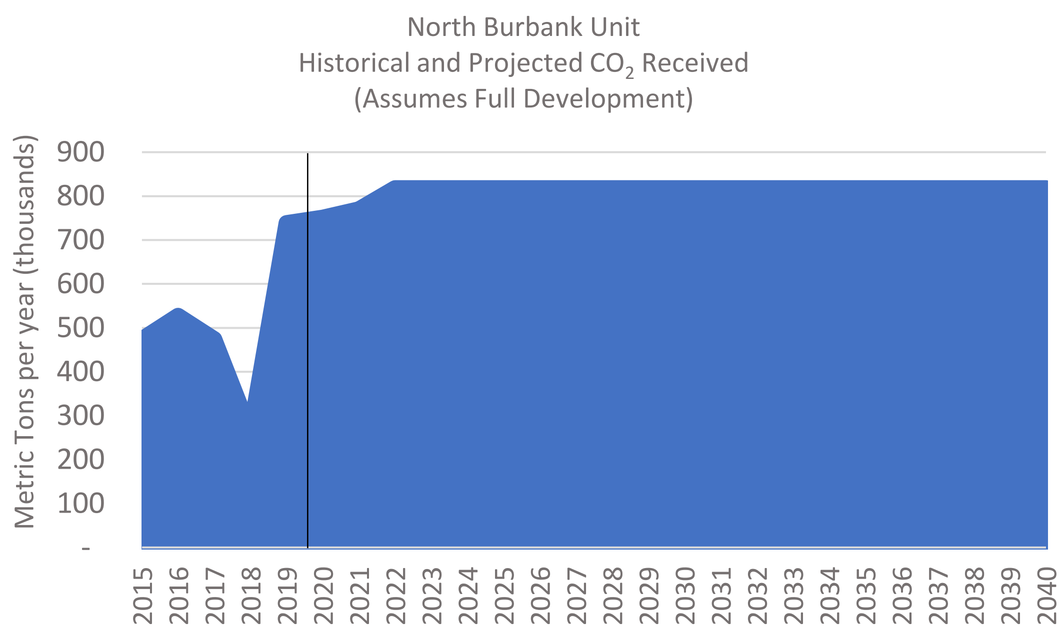

Figure 1 –Historic and Forecast CO_2 Injection and Storage at the NBU

2.2. Estimated tons of CO_2 injected and stored

The amount of CO_2 injected at the NBU is adjusted periodically to maintain reservoir pressure and to increase recovery of oil by extending or expanding the EOR project. The amount of CO_2 injected is the amount needed to balance the fluids removed from the reservoir and to increase oil recovery. While the model output shows CO_2 injection and storage through 2060, this data is for planning purposes only and may not necessarily represent the actual operational life of the NBU EOR project. As of the end of 2019, 143.8 BCF (7.58 million metric tons (MMT)) of CO_2 has been injected into the NBU. Of that amount, 77.6 BCF (4.09 MMT) was produced and recycled.

While tons of CO_2 injected and stored will be calculated using the mass balance equations described in Section 7, the forecast described above reflects that the total amount of CO_2 injected and stored over the modeled injection period to be 514 BCF (27.11 MMT). This represents approximately 46.7% of the theoretical storage capacity of the NBU.

2.3. Geologic Setting

The project site for this MRV Plan is the North Burbank Field, located in Osage County, Oklahoma. See Figure 2 for a general location of Osage County, Oklahoma.

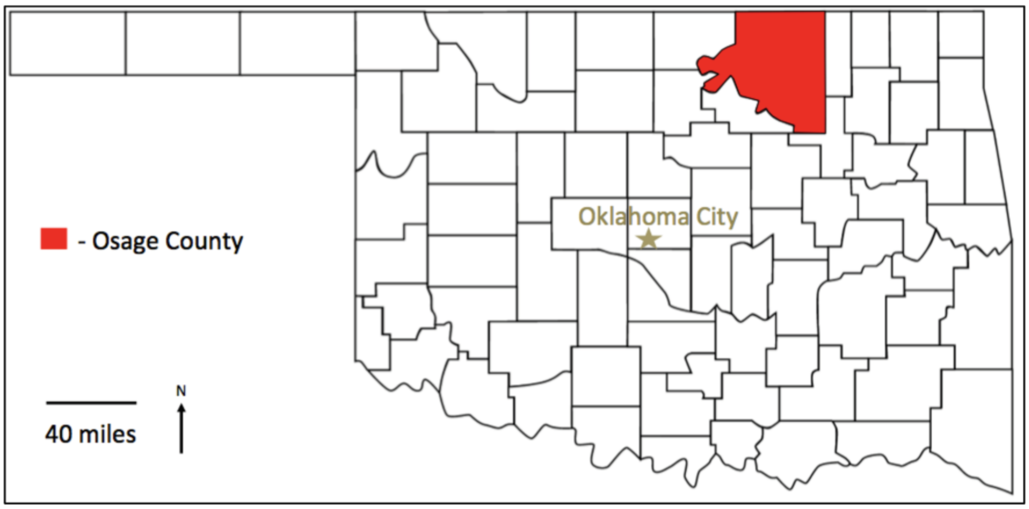

Figure 2 – General Location of Project[3]

The North Burbank Field is a sandstone reservoir that is a large oil trap. The oil producing zone is a large sand body comprised of many overlapping sand bars deposited along the southern shore of the Cherokee sea of Pennsylvania Age. The oil trap is an updip pinch-out of multistoried sands deposited into channels, eroded into underlying marine shales. The overlapping and erosional contact between these channels produced a net effect of a wide, single sand body. Intermittent marine incursions spread the reservoir in an east-west direction, further widening the sand body. The channels have a north-south trend. The reservoir is a well-consolidated sand and is rather strongly oil-wet. It is a Fluvial dominated deltaic (Class 1) reservoir. The reservoir is heterogeneous horizontally and vertically.[4] The Cherokee platform is a province with a relatively stable geologic history.[5]

The Burbank Sandstone includes the Red Fork and Bartlesville formations. "The Bartlesville and Burbank sands are so similar in composition and physical characteristics that they cannot be differentiated with certainty."[6] For convenience, this MRV Plan will refer to the Burbank Sandstone, the Red Fork formation and the Bartlesville formation collectively as the "reservoir". At the Burbank Field, the reservoir is about 3,000 feet below the surface, located in Ranges 5E-6E and Townships 26N-27N in Osage County, Oklahoma. The Burbank Field is 12 miles long, 4.5 miles wide, and trends in a southeast-northwest

[3] West (2015).
[4] Lorenz (1986).
[5] West (2015); Kleinschmidt (1976).
[6] Leatherock (1937).

direction. The sand is largely composed of fine- and medium-grained quartz cemented with silica, dolomite, ankerite and calcite.

The Burbank Field was discovered in 1920. The Burbank Field is located in western Osage County, in north-central Oklahoma (see Figure 3). The Burbank Field is approximately 25 miles east of Ponca City, Oklahoma, and 60 miles northwest of Tulsa, Oklahoma, as indicated by the red dot in Figure 3.

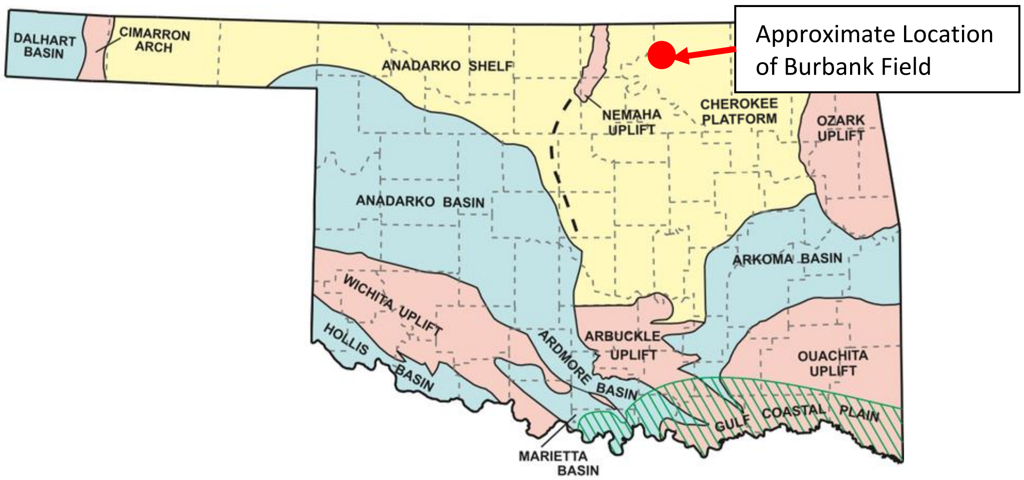

Figure 3 – Paleogeographic Map of Oklahoma[7]

As shown in Figure 3, Osage County, and the NBU, is bound to the east by the Ozark Uplift, and to the west by the Nemaha Uplift. In Osage County, regional dip of the strata is to the west-southwest.[8]

The Burbank Field is one of the largest oil fields in the United States and has approximately 824 million barrels of Original Oil In Place (OOIP). Since first discovered in the 1920s, the Burbank Field has produced approximately 360 million barrels of oil, or 39% of the OOIP. The reservoir has been buried underneath thick layers of impermeable rock. Over time, subsurface elevations within the reservoir have become uneven, creating variations in elevations and relatively higher subsurface elevations in locations such as the Burbank Field where oil and natural gas have accumulated.

[7] Villalba (2016).
[8] West (2015).

The reservoir (highlighted in green in Figure 4) now lies beneath approximately 3,000 feet of overlying sediments. There are numerous formations above the reservoir that are impermeable and serve as reliable barriers to prevent fluids from moving upwards towards the surface. These barriers, or "seals", effectively seal fluids into the formation(s) beneath them. In the Burbank Field, the first seal is the Pink Limestone member of the Cabaniss formation in the Cherokee Group. Above this lie over 10 additional intervals of impermeable rock layers of various thicknesses, including the Verdigris Lime, the "Big Lime" and the Avant/Iola Lime formations or members. These formations and members are highlighted in brown in Figure 4.

Depth	System	Series	Group	Formation	Member
	Quaternary	Quaternary	Alluvium & Terrace		
	Permian	Leonardian	Sumner	Wellington	
		Wolfcampian	Chase	Oscar	
			Council Grove	Vanoss	Red Eagle Lime
50'				Sand Creek	Foraker Lime
			Admire Group		Admire Shale
~200'	Pennsylvanian	Virgilian	Wabaunsee	Ada	Campbell, Ragan, Crews and Ebert Sands
				Pawhuska	Burlingame Lime
					Newkirk Sand
~725'			Shawnee	Elgin	Pawhuska (Deer Creek) Lime
~900'					Hoover, Elgin, and Carmichael Sands
~1000'				Nelagoney (Vamoosa)	Oread Lime
~1150'					Endicott & Lovell Sands
			Douglas		Haskell Lime
~1400'					Fourmile, Cheshewalla, Revard, Bigheart and Tonkawa Sands
		Missourian	Ochelata		Wildhorse Lime
`1700'				Barnsdall	Okesa Sand (Suitcase Sands)
					Lane-Vilas Shale
				Torpedo	Torpedo Sand
				Wann	Clem Creek (Perry Gas) Sand
~1875'				Iola	Avant/Iola Lime
					Muncie Creek Shale
					Paola (Loula) Lime
~1950'				Chanute	Osage Layton (Cottage Grove) Sand
			Skiatook	Dewey Lime	Dewey/Drum Limestone
				Nellie Bly	Cherry Vale Shale
					Layton (Shell Creek), Mussellem and
					Hogshooter (Dennis) Limestone
~2250'				Coffeyville	True Layton (Dodd Creek) Sand
~2400'					Checkerboard Lime
~2450'				Seminole	Cleveland Sands
		Desmoinesian	Marmaton	Holdenville	
					Memorial Shale
				Lenapah	Lenapah Lime
				Nowata	Nowata Shale
					Altamont Lime
					Bandera Shale
~2490'				Oologah	Big Lime (Pawnee Lime)
~2575'				Labette	Labette (Cherokee) Shale
~2625'				Fort Scott Lime	Oswego Lime
			Cherokee	Cabaniss (Senora, Boggy Savanna)	Little Osage, Excello and Oakley Shales
~2750'					Prue (Squirrel) Shale and Sand
					Verdigris Lime
~2865'					Skinner and Sonner Sands
~2890'					Pink or "Hot Pink" Lime
~3000'				Krebs	Burbank (Red Fork and Bartlesville) Sands
					Brown Lime
					Penn Shales
~3030'	Mississippian	Osagean	Boone Group		Boone Lime
		Kinderhookian	St. Joe Lime		St. Joe Lime
~3300'	Devonian		Chattanooga (Woodford) Shale		Misener Sand
	Ordovician		Sylvan Group		Sylvan (Maquoketa) Shale
			Viola Group		Viola (Fite) Lime
			Simpson Group		Wilcox Sand
					Tyner Shales and Sands
					Burgen Sand
~3525'	Cambrian		Arbuckle Group		
~3800'			Siliceous Lime		
~3850'			Reagan Sand (Timbered Hills) & Granite Wash		
~4400'	Pre-Cambrian		Spavinaw Granite & Washington County / Rhyolite		

Figure 4 – Generalized Stratigraphic Column for Osage County, Oklahoma (compiled from Keeling (2016); Suneson (2010); West (2015); Jennings (2014); Li (2014); Reeves (1999); Stafford (2014); and Bass (1942)

The Burbank Field includes formations that involve incised valley fill sequences. The geologic depositional model of the Burbank Field is depicted in Figure 5 below.

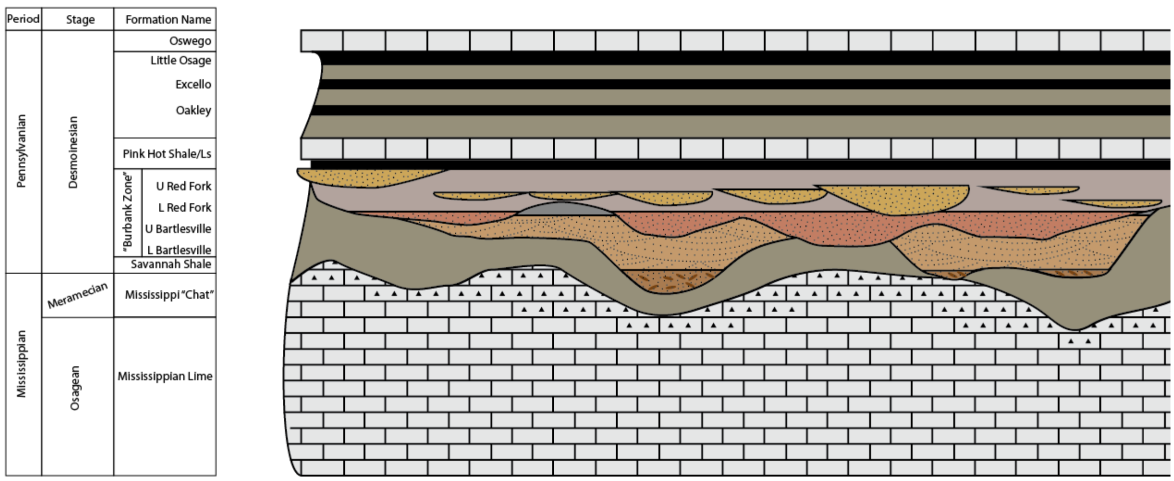

Figure 5 – Geological Depositional Model, NBU

As shown in Figure 5, multiple layers of caprock or "seals" are naturally provided above the reservoir, which is depicted as the "Burbank Zone" in Figure 5. These seal formations include the Hot Pink Limestone and the Oswego Limestone, each of which are impermeable and provide a reliable barrier to prevent injected CO_2 from moving upward towards the surface. These seal layers are depicted as "Marine Shales" in Figure 6 below, and the reservoir or "Burbank Zone" is indicated as "Channel Sandstones" in Figure 6.

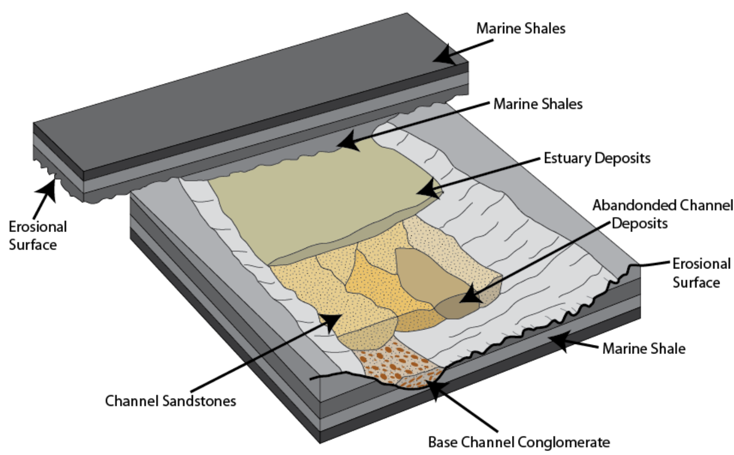

Figure 6 – 3D Rendering of Geological Depositional Model, NBU

Other than as described below, there are no known faults or fractures in the Burbank Field that provide a potential pathway for upward fluid flow. The fact that significant amounts of oil and natural gas have been produced from the reservoir is one confirmation of this fact and is indicative that a good quality natural seal exists. Oil and natural gas tend to migrate upward over time because they are less dense than brine found in various rock formations. Locations where oil and natural gas have been trapped in

the deep subsurface provide positive proof that faults and fractures do not provide a potential pathway for upward flow of injected CO_2 from the reservoir.

The operating history of the Burbank Field also demonstrates that there are no faults or fractures penetrating the reservoir, other than as described below. Fluids including water, carbon dioxide and polymers have been successfully injected into the NBU since 1950. The reservoir is characterized by east-west jointing, or fracturing, such that the effective permeability in the east-west direction is five times as great as that in the north-south direction. This results in a preferential east-west movement of injected fluids. For this reason, flooding operations in the NBU has generally developed by injecting water in east-west rows of wells and producing alternate rows of wells.[9] CO_2 injection has been similarly initiated, beginning in 2013. CO_2 and water are both injected in the CO_2-EOR portion of the NBU in a water alternating gas (WAG) process, where water is injected for a certain time period, followed by CO_2 for a certain time period, and then repeating the process. Water curtain injection (WCI) described below is the historic method used for decades during the waterflood in the NBU to address the flow of fluids within and external to the NBU unit boundary, and continues to be used during the CO_2-EOR flood operations. Other than as described above, there is no evidence of any interaction with existing or new faults or fractures. The absence of these faults and factures is one of the reasons why the NBU is such a strong candidate for water-flooding and now CO_2-flooding operations.

Figure 7 (on page 9) provides an overhead view of the geologic structure of the reservoir at the NBU, and the colors indicate changes in subsurface elevation. In Figure 7, red/orange represents the higher elevations (i.e. the level closest to the surface) and blue/magenta represents the lower elevations (i.e. the level furthest below the surface). In the NBU, the higher elevations of the reservoir are to the east, southeast and south. The north half of the reservoir dips down in elevation to the west.

[9] Kleinschmidt (1976).

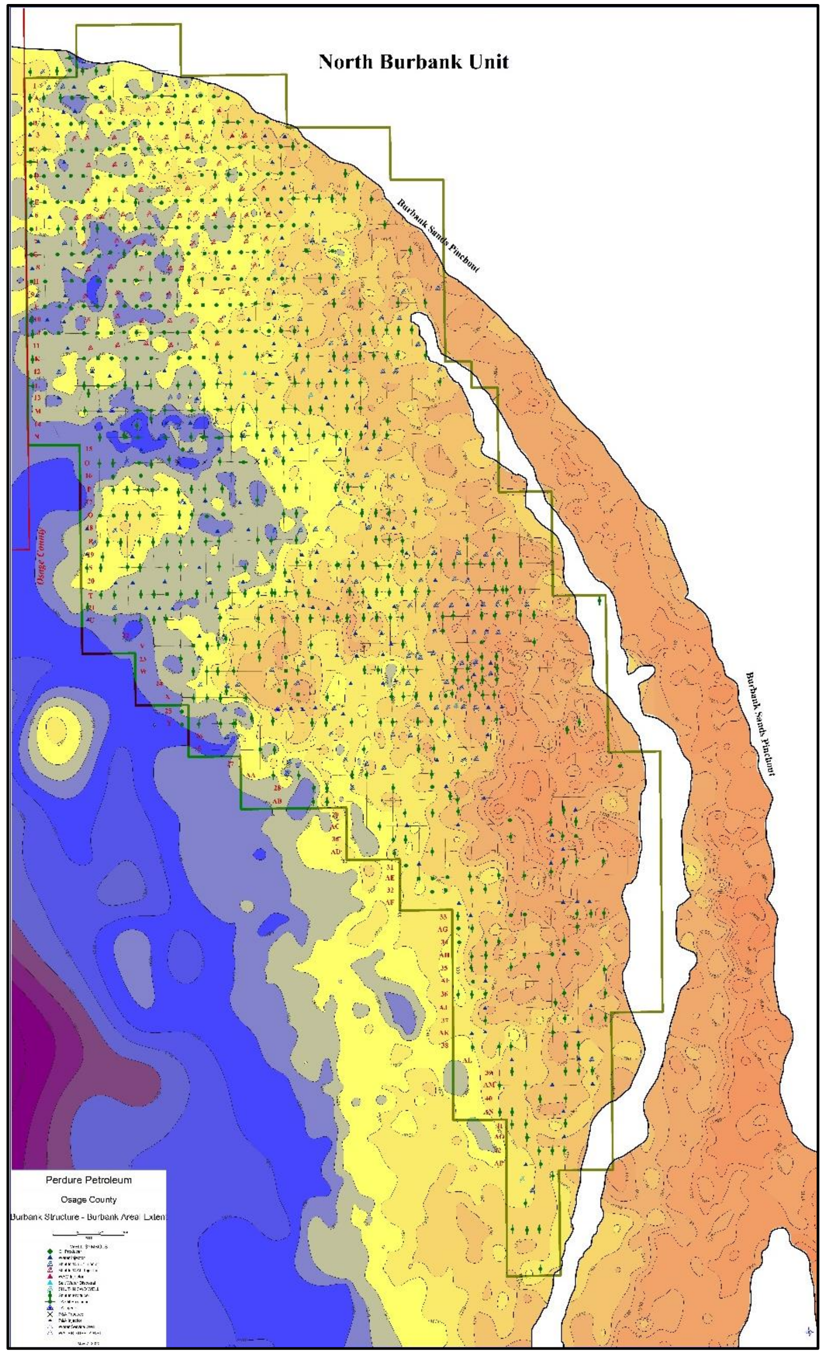

Figure 7 – Structure Map of the Top of the Burbank Sandstone

Buoyancy dominates the interaction of fluids in a reservoir. Gas is the lightest and rises to the top. Water is heavier and sinks to the bottom. Since oil is heavier than gas but lighter than water, it lies in between. Mobile CO_2 that is not miscible with the oil in the reservoir, whether in its gaseous phase or in its dense or supercritical fluid phase, is driven by buoyancy forces and gradually rises upward over time. Fluids including CO_2 and oil rise vertically until reaching the highest elevation in the structure. In the NBU, that highest elevation is to the east. Operationally, the reservoir boundaries of the NBU are maintained with a "water curtain".

Water curtain injection (WCI) is a common operations method in the CO_2-EOR industry involving continuous CO_2 injection in a selected area, with the addition of peripheral continuous water injection (commonly along the oil-water contact). WCI operations are conducted to create a pressure barrier or "curtain" to contain the injected CO_2 within the desired reservoir or rock volume, to focus the injected CO_2 to the area selected for production, to maintain the CO_2 within the confines of a CO_2-EOR project, and to prevent the CO_2 from impacting areas in the reservoir that are not under CO_2 flooding operations. WCI operations are efficient methods of maintaining and controlling lateral migration of fluids to assure that CO_2 does not cross structurally deficient locations.[10]

Because of the WCI operations employed at the NBU unit boundaries, injected fluids (including CO_2) stay in the reservoir within the NBU unit boundary and do not move to adjacent areas.

[10] Nunez-Lopez (2017); Davis (2019); Hvorka (2015); Gaines (2009); and APGTF (2002).

When water and supercritical CO_2 are injected into an oil reservoir, they are pushed from injection wells to production wells by the high pressure of the injected fluids. When the CO_2-EOR operation is complete and injection of CO_2 is terminated, the injected CO_2 that is not dissolved in the remaining oil or water in reservoir will remain in the reservoir and will rise slowly upward due to buoyancy forces. However, at the NBU, the amount of CO_2 stored in the reservoir at that time will not exceed the secure storage capacity of the NBU reservoir. As explained in Section 2.2 above, the CO_2 stored in the NBU will fill approximately 46.7% of the total calculated storage capacity of the reservoir. As a result, there is more than enough pore space to retain the projected amount of stored CO_2.

Certain attributes of the reservoir are summarized in Table 1 below.

NBU Reservoir Characteristics (historic or current)

Unitized Area, acres	23,240
Area, square miles	~36.3
Depth, feet (average)	~2,900
Thickness, feet (average)	45 – 60
Dip	W-SW @ ~ 0.5^o
Porosity, percent average	16.8 – 22%
Permeability, millidarcies (md)	32 – 313
Water Saturation (Initial)	0.27 – 0.34
Viscosity of Oil, centipoise (cP)	~3
Permeability Variation (Dykstra-Parsons)	0.48 – 0.81
Boi (reservoir volume factor, reservoir bbls/stock)	1.23
Solution GOR (original), cf/STB	472
Reservoir Temperature, ^{o}F	122
API Stock Tank Oil Gravity	~39
Unit OOIP, MMSTBO	824
Fracture Pressure (at MMP), psig	~2,030
Original Reservoir Pressure, psia	1,350
Minimum Miscibility Pressure (MMP) (Slimtube), psia	~1,670
Pattern Size, acres	40
Primary Recovery, %OOIP	~18.1
Secondary Recovery, %OOIP	~20.7
Secondary to Primary Ratio	1.14
Tertiary (technically recoverable), %OOIP	12.6
Cumulative Oil Production, MMSTBO	~320
Cum Tertiary (CO_2-EOR) Production (to date), MMSTBO	3.4
Pore Volume, MM BBL	1,492.3

Table 1 – NBU Reservoir Historic or Current Characteristics

When wells are drilled, a detailed record of the geological formation is prepared either by taking samples through visual inspections or with the aid of measurement instruments lowered into the borehole. This detailed record, known as a well log, provides vital information regarding the rocks, fluids and other characteristics of the geology above, in, and below the target reservoir. Sometimes the drilling of a well also includes obtaining a rock sample (or core) from the wellbore at various elevations or formations. Numerous NBU wells have been drilled, logged and cored. NBU Well Nos. 22-42W and 22-27W are exemplar wells, and their core and log are provided below in Figure 8. Another type well log is for NBU Well No. 33-41W and is provided below in Figure 9.

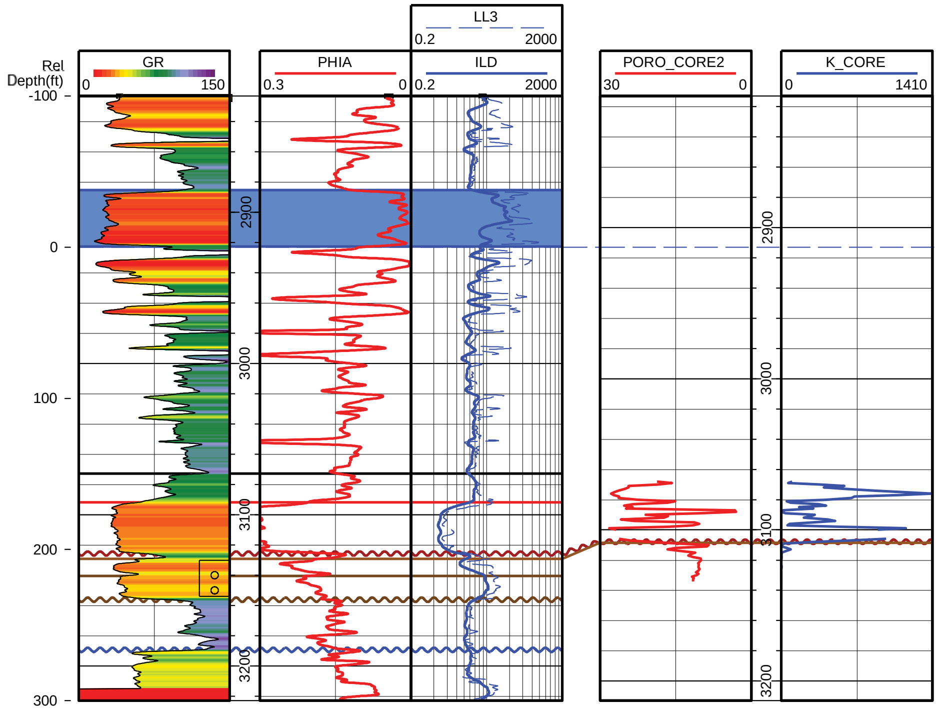

Figure 8 – Exemplar Conventional NBU Well Log and Core

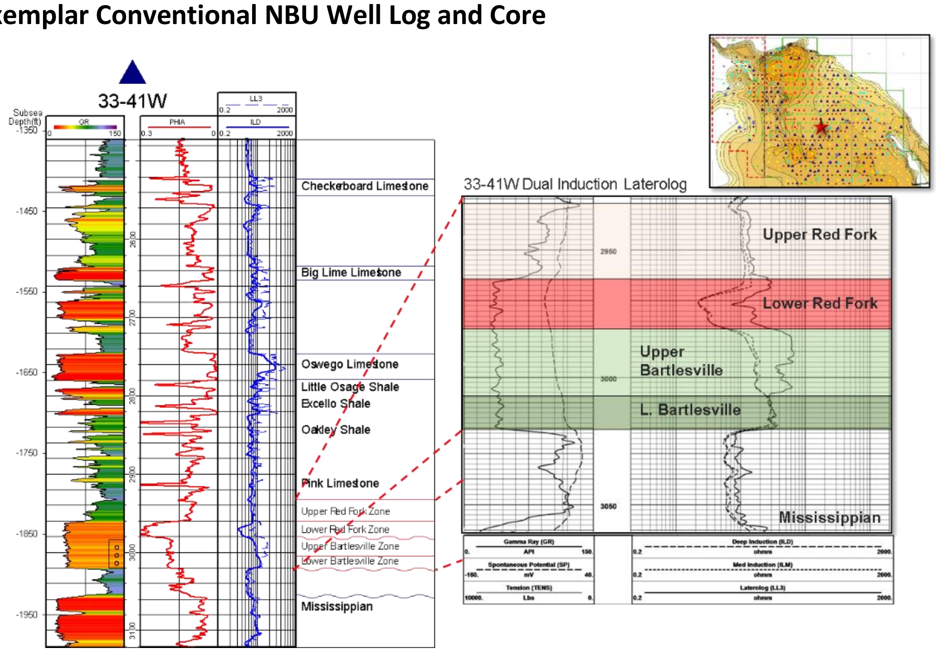

Figure 9 – Type Log of NBU Well

2.4. Operational History[11]

The Burbank Field in Osage County, Oklahoma, was discovered by the Marland Oil Company in May 1920. The Burbank Field was extended several miles to the southeast when The Carter Oil Company completed the second well in in September 1920. The Burbank Field was developed rapidly. Wells were drilled with cable tools and, upon completion, were produced wide open by flowing, swabbing, or pumping to capacity.[12] The wells were heavily shot upon completion or as soon thereafter as they quit flowing. Peak production of 122,000 barrels of oil per day was reached in July 1923. By 1924, 75% of the wells in the main part of the NBU had been drilled. Production declined rapidly because of the large volume of fluid being produced from the reservoir without any injection support.

The practice of pulling vacuum on wells began in 1924 to increase production. Vacuum was discontinued in 1939. Repressuring was inaugurated on a limited scale in 1926. Repressuring using natural gas purchased from outside the NBU was commenced in 1935 and continued for many years.[13]

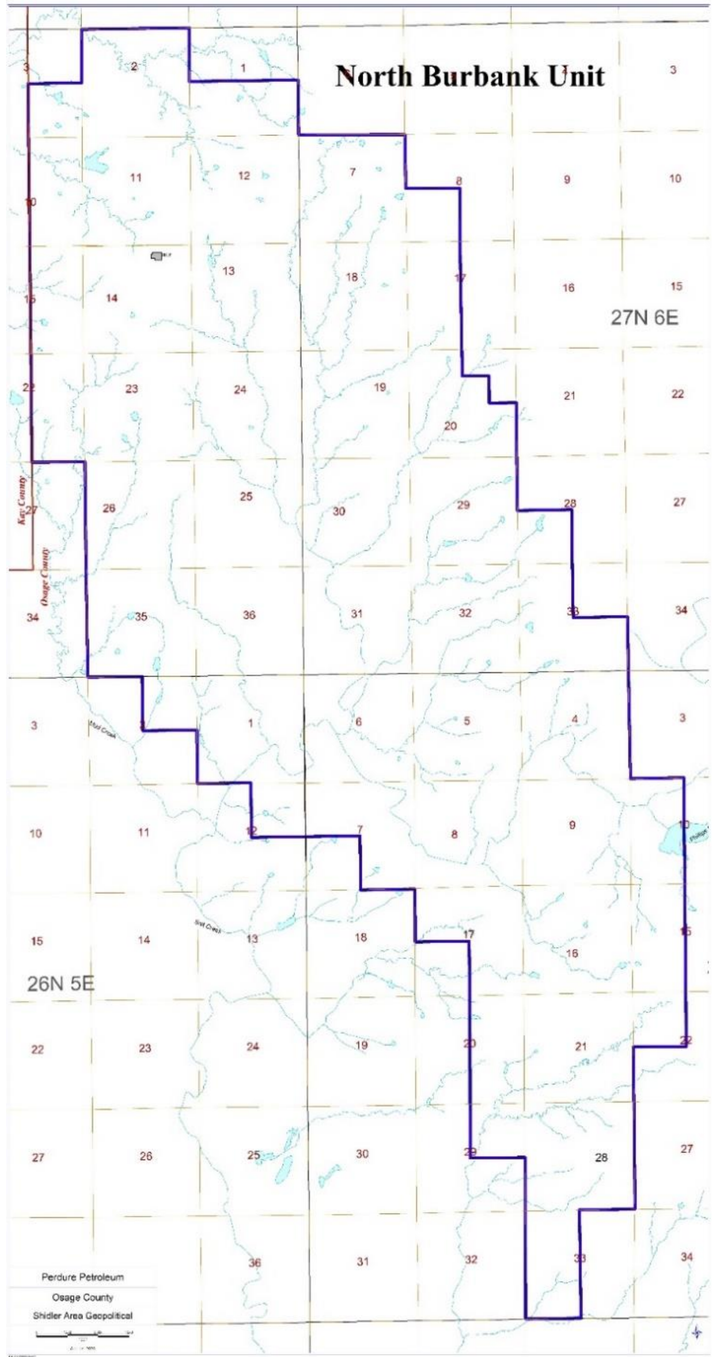

Figure 10 – North Burbank Unit Boundary Map

The NBU was originally developed by numerous individuals and companies under various separate leases from the Bureau of Indian Affairs (BIA) and the Osage Nation in Osage County. Over time, to improve efficiency, several smaller leases were combined or unitized into larger units which are operated without the operational restrictions imposed by the former lease boundaries. The NBU was formed in 1950. The NBU is the single largest oil recovery unit in the state of Oklahoma. The boundaries of the NBU are reflected in Figure 10.

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[11] Compiled from various reports including Bass Report 10 (1942); Hunter (1956), Li (2014); and Stafford (2014).

[12] "When gushers came in, earthen dikes were used to hold the oil until storage tanks could be built." http://www.tgp-docents.com/docent/osage.html

[13] Hunter (1956).

The NBU was unitized in 1950, coordinating 20 leaseholders with a unitized area of 23,240 acres. The boundaries of the NBU include the small unincorporated town of Webb City, Oklahoma, a booming oil camp in the 1920s, but with a population of less than 50 people today.

When oil was discovered in the Burbank Field in the 1920s, oil was found at the top of the sand in practically all wells, and there is no evidence of an initial gas cap. The reservoir energy was supplied almost entirely by dissolved gas in the oil. This type of oil reservoir offers good waterflooding opportunities.

Waterflooding was initiated in the NBU over a 15-year period beginning in 1949. Waterflooding the NBU was one of the world's largest waterflooding projects at that time.[14] Waterflooding began on the southern portion of the unit and was gradually extended toward the north until 1964 when it reached the northern edge.[15] Initial waterflood design of a 5-spot 20-acre spaced pattern quickly changed to a north-south elongated 5-spot 20-acre pattern developed in alternate east-west rows, accounting for a preferential east-west movement of injected fluid.[16] Phillips Petroleum Company operated the NBU beginning in 1950 upon unitization, and implemented the waterflood.

Starting in 1965, a steam drive pilot was conducted, but results were disappointing.[17] A successful polymer flood pilot test was conducted from August 1970 through 1979 on two particular tracts.[18] In the late 1970s, NBU Tract 97 was part of a multi-year Department of Energy (DOE) surfactant polymer pilot.[19] A commercial scale freshwater polymer flood was conducted in the Webb City area of the NBU beginning in 1980.[20]

CO_2-EOR operations began in the NBU on June 6, 2013 and has continued and expanded since that time. The experience at NBU of operating and refining the waterflood since 1950 and the CO_2-EOR flood since 2013 has created a strong understanding of the reservoir and its capacity to store CO_2.

Phillips Petroleum Company operated the NBU from unitization until November 1995, when Phillips sold the NBU to Calumet Oil Company.[21] Chaparral Energy bought the NBU from Calumet Oil Company on October 31, 2007. The current operator is Perdure Petroleum, which acquired the NBU from Chaparral in November 2017. Perdure Petroleum maintains a 99.25% working interest in the NBU and a 86.85% net revenue interest. The operator also owns significant portions of the surface within the NBU unit boundaries. The Osage Indian Nation owns 100% of the oil and gas minerals in Osage County, including the minerals in the NBU.

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[14] Li (2014); see also Reese, L.W., Loughlin, P., *Main Street Oklahoma: Stories of Twentieth-Century America*, p 106 (2013) ("At the time that it was instituted in 1949, the waterflood project in the North Burbank Field was one of the largest secondary recovery efforts in the history of the petroleum industry.")
[15] Pang (1981).
[16] Hunter (1956).
[17] Trantham (1982).
[18] Pang (1981).
[19] Bradford (1980).
[20] Pang (1981); Moffit (1993).
[21] Westermark (2003).

2.5. Description of Injection Process and Project Facilities

The injection process for the CO_2-EOR operations in the NBU generally consists of three (3) primary processes:

1. CO_2 distribution and injection
2. Injection and production wells
3. Produced fluids handling and gas compression

The CO_2 distribution and injection process begins with receiving CO_2 delivered to the NBU for purposes of injection. The CO_2 delivered to the NBU is supplied by one or more sources, such as CO_2 delivered from the Coffeyville CO_2 Pipeline and CO_2 received from the NBU Recycle Compression Facility (RCF). The delivered CO_2 is then sent through the injection pipeline distribution system to various CO_2 injection wells throughout the NBU.

The produced fluids handling system gathers fluids from the production wells in one or more areas within the NBU. While production wells in the NBU produce a mixture of oil and water fluids, some of the production wells also produce CO_2 or other gases. The mixture of produced fluids (oil, water and CO_2 and other gases) flows to satellite batteries for separation and/or to centralized tank batteries where gases and fluids are separated. The fluids stream is further separated into oil that is sold by truck or pipeline, and water that is recovered for reuse, reinjection or disposal. The gas stream, consisting of CO_2 and other gases, is transported to the RCF.

The produced gas compression process consists of gathering CO_2 and other gases that may be produced from the active CO_2-EOR portion of the NBU, and compressing the CO_2-rich gas stream for ultimate reinjection into the NBU. Currently the RCF is the only facility that performs this function, but additional recycle compression facilities may be installed in the future and would provide the same function. In addition, natural gas liquid (NGL) recovery operations may be installed at the RCF or other recycle compression facilities in the NBU in the future, to separate NGLs from the stream of CO_2 and other gases, and the NGLs would be sold by truck or pipeline.

2.5.1. CO_2 Distribution and Injection

Currently, CO_2 delivered to the NBU for injection is received through many meters. One meter measures the amount of CO_2 at each CO_2 source location. Another meter measures the amount of CO_2 delivered from the Coffeyville CO_2 Pipeline. Other meters measure the amount of CO_2 at the outlet of the NBU RCF compressors, and a central meter (downstream of all RCF compressors) may be installed at the outlet of the RCF. As the NBU is developed for CO_2-EOR purposes, it is anticipated that CO_2 delivered to the NBU for injection may be received through additional meters, such as from additional recycle compression facilities in the NBU or other CO_2 sources of pipeline delivery points.

All CO_2 that flows through the meters is sent through CO_2 injection lines to individual injection wells in the NBU, and in many instances through manifolds and distribution lines prior to arriving at the injection well. Currently, each CO_2 injection well has the ability to inject either CO_2 or water, at various rates and injection pressures, as determined by the EOR operator. A flow meter is used at each injection well to measure the injection rate of the CO_2 (or water, as the case may be). Currently, for any given CO_2 injection well, the CO_2 injected may be sourced from the Coffeyville CO_2 Pipeline, the RCF, or a combination thereof.

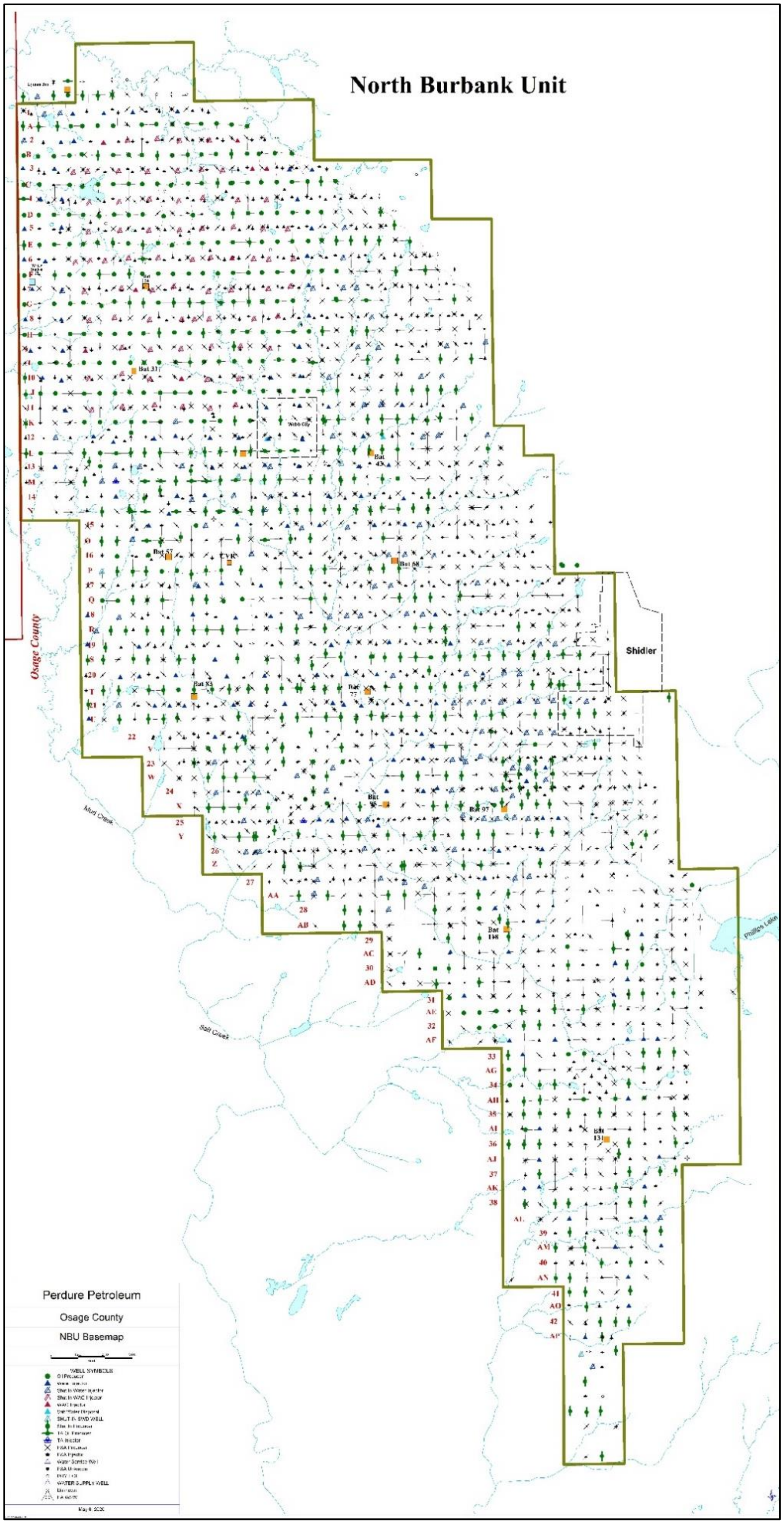

Figure 11 – North Burbank Unit Wells as of January 2019

In January 2019, about 100 MMSCF/d (5,250 MT) of CO_2 is injected into the NBU each day, of which approximately 45% is from the Coffeyville CO_2 Pipeline and the balance (55%) is recycled CO_2 from the RCF. The ratio of CO_2 sources is expected to change over time, and eventually the percentage of recycled CO_2 will increase and deliveries of CO_2 from the Coffeyville CO_2 Pipeline will taper off. There are volume meters at the inlet and the outlet of the RCF.

2.5.2. Injection and Production Wells

As of January 2019, there are 439 active completed wells in the NBU. Those wells consist of 248 production wells, and 191 injection wells. In addition, there are about 2,406 wells that are not in use, such as being inactive, temporarily abandoned, shut in, or plugged and abandoned. As a result, the total number of wells in the NBU is currently about 2,845 wells. The location of the NBU wells is indicated in Figure 11.

Wells located in Osage County, Oklahoma are regulated by the EPA Region 6 office. The EPA Region 6 granted authority to inject CO_2 into the NBU pursuant to Underground Injection Control (UIC) permits for the NBU, which state that permit authorization must be obtained from the Bureau of Indian Affairs (BIA) for various activities related to the NBU CO_2-EOR operations. Those permits also state that the base of underground sources of drinking water is 245 feet below the surface. Regulations and/or the permit(s) require that all wells drilled through this interval be cased and cemented to prevent the movement of fluids from the injection zone into another zone or to the surface around the outside of a casing string.

2.5.3. Produced Fluids Handling and Gas Compression

Upon injection of CO_2 or water into the reservoir, a mixture of oil, gas and water (collectively, "produced fluids") is moved towards a production well. Once produced at the production well, the produced fluids are produced into gathering lines that combine, collect and commingle the produced fluids. In the CO_2-EOR portion of the NBU, the produced fluids then flow into a satellite separation facility and then to a battery. Each satellite is equipped with well test equipment to measure production rates of oil, gas and water from individual production wells. In addition, CO_2 and liquids are separated at the satellites. In the portion of the NBU where CO_2 is not injected (waterflood only area), the produced fluids flow directly into a battery. Production in the NBU is from one of the 248 active production wells, which is sent to one of eight batteries (two in the CO_2-EOR area, and six in the waterflood only area). Each battery has a large vessel that performs a gas-liquid separation.

Once any remaining gas and fluids are separated at the batteries in the CO_2-EOR portion of the NBU, the gas phase is transported by pipeline to a recycle compression facility ("RCF") for additional separation and then compression, dehydration and pumping as described below. The average composition of this gas mixture is approximately 95-99% CO_2 and the remaining portion is composed of hydrocarbons, a trace of nitrogen, and hydrogen sulfide (H_2S) at approximately 50-165 parts per million (ppm). This CO_2 concentration is likely to change over time as CO_2-EOR operations continue and expand. The CO_2 at the outlet of the RCF is transported to the injection system described in Section 3.3.1 above.

Produced oil from the NBU is metered through one or more Lease Automatic Custody Transfer (LACT) units located at centralized tank batteries in the NBU, prior to being sold. Currently, the LACT units in the CO_2-EOR portion of the NBU are Tank Batteries 24 and 31. This oil contains a small amount of dissolved or entrained CO_2. A recent sample of oil indicated that the dissolved CO_2 content is approximately 0.26-0.31% by weight in the oil. Any gas that is released from the liquid tanks at Tank Batteries 24 and 31 is collected by one or more Vapor Recovery Units (VRU) that compresses the gas and sends it to an RCF for processing. This gas stream may include trace amounts of CO_2.

The oil produced from the NBU is slightly sour, containing small amounts of hydrogen sulfide (H_2S), which is highly toxic. All field personnel are required to wear H_2S monitors. Although the primary purpose of those monitors is to detect H_2S and protect employees, monitoring of H_2S will also supplement other CO_2 leak detection methods described in this MRV Plan.

2.5.4. Modifications to Project Facilities and Injection Processes

Perdure plans to continue routine business operations in and near the NBU, which may include securing CO_2 from additional sources; changing the status of existing wells, adding new wells, closing wells; deepening existing wells or drilling new wells to a deeper formation for CO_2 injection into that deeper formation; and adding new facility equipment or pipelines. These modifications represent a continuation of the current integrated configuration and MRV approach and are not a material change that would trigger a revised plan required by Section 98.448(d). Any such changes would be indicated in

the annual monitoring report rather than in a new or amended MRV plan. Prior to any CO_2 injection into a deeper formation, Perdure would comply with the statutory and regulatory process for obtaining all necessary permits. New facility equipment additions could include additional recycle compression facilities in the NBU. Any such changes reflected in an annual monitoring report would include, as necessary, a description of how the change is a continuation of the existing project facilities and injection process and would also include any new site characterization, risk assessment, monitoring and mass balance information.

3. Delineation of the monitoring areas and time frames

The current active monitoring area (AMA) as well as future AMA are described below. In addition, the maximum monitoring area (MMA) of the free phase CO_2 plume and its buffer zone are defined below. Also, the monitoring time frames for both the AMA and the MMA are described.

3.1. Active Monitoring Area

Because CO_2 is present in the NBU, and is retained within that area, the current active monitoring area (AMA) is defined by the boundary of the NBU. This boundary is reflected in Figure 10 above. The following factors were considered in defining this boundary:

- CO_2 is present in the NBU. More than 143.8 BCF (7.58 MMT) of CO_2 has been injected into the NBU since 2013. There has been infill drilling in the NBU to complete additional wells to further optimize production. There has been production of CO_2 in the NBU. Operational results thus far indicate that there is CO_2 in the NBU.

- CO_2 injected into the NBU remains contained within the NBU because of the fluid and pressure management impacts associated with CO_2-EOR operations. Managed lease-line injection and production wells are used to retain fluids in the NBU. Water curtain injection (WCI) operations, described in Section 2.3, have been used for decades in the NBU to retain fluids in the NBU, including the CO_2-EOR portion of the NBU since CO_2 injection began in 2013. There is evidence that operations by the prior EOR operator failed in some instances to maintain the water curtain in the CO_2-EOR area of the NBU as a result of over-producing the western edge of the active CO_2-EOR area and allowing small amounts of injected CO_2 to move outside the west edge of the NBU. Current operations strictly maintain the water curtain so as to prevent such CO_2 migration in the reservoir. Current operational results (such as normal pressures in the injection interval and injection and production rates within predicted ranges) indicate that injected CO_2 is retained in the NBU.

- Over geologic timeframes, injected CO_2 will remain in the NBU and will not migrate downdip to the western edges of the NBU, because the reservoir in the unit boundary of the NBU is higher in elevation than the reservoir west of the NBU unit boundary. While the reservoir in the Stanley Stringer to the east and northeast of the NBU is higher in elevation than the reservoir in the NBU, water curtain injection (WCI) operations described in Section 2.3 have been used to isolate the Stanley Stringer and the NBU for decades, and will continue to be used. Just as oil and gas were trapped in and contained in the NBU, as demonstrated by the long history of oil and gas production occurring within the NBU, so will the injected CO_2.

As CO_2 injection operations are expanded beyond the currently active CO_2-EOR portion of the NBU into other areas of the NBU, then the AMA is anticipated to expand to include areas within the NBU into which the CO_2 is injected. Such expansions will be reported in the Subpart RR Annual Report for the NBU, as required by Section 98.446.

3.2. Maximum Monitoring Area

The maximum monitoring area (MMA) is defined in Section 98.449 as equal to or greater than the area expected to contain the free-phase CO_2 plume until the CO_2 plume has stabilized, plus an all-around buffer zone of one-half mile. Section 4.1 states that the maximum extent of the injected CO_2 is anticipated to be bounded by the NBU unit boundary. Therefore, the MMA is the NBU plus the one-half mile buffer as required.

3.3. Monitoring time frames

The primary purpose for injecting CO_2 in the NBU is to produce oil that would otherwise remain trapped in the reservoir. The primary purpose for injecting CO_2 in the NBU is not, as stated in UIC Class VI regulations at 40 CFR 146.81(b), "specifically for the purpose of geologic storage." During a Specified Period, there will be a subsidiary or ancillary purpose of establishing the long-term containment of a measurable quantity of CO_2 in the reservoir. The Specified Period will be shorter than the period of oil production from the NBU. This is in part because the delivery of CO_2 for injection from sources other than a recycle compression facility is projected to taper off significantly before oil production ceases in the NBU, which is modeled through 2060. At the conclusion of the Specified Period, a request for discontinuation of reporting under Subpart RR will be submitted. This request will be submitted when it can be demonstrated that then-current monitoring and/or model(s) show that the cumulative mass of CO_2 reported as sequestered during the Specified Period is not expected to migrate in the future in a manner likely to result in surface leakage. It is expected that it will be possible to make this demonstration within three years after injection for the Specified Period ceases. The demonstration will rely on at least the following three principles: (1) the amount of CO_2 stored in any properly P&A'd wells will be considered unlikely to migrate to the surface; (2) the continued process of fluid management during the years of CO_2-EOR operation after the Specified Period will contain injected fluids in the NBU; and (3) the cumulative mass reported as sequestered during the Specified Period is a fraction of the theoretical storage capacity of the NBU.

4. Evaluation of Leakage Pathways

The reservoir in the NBU has been studied and documented extensively for decades, including through the publications listed in Section 12.5. Knowledge gained through the 100+ year history of oil and gas production in the NBU has been used to identify and assess potential pathways for leakage of CO_2 to the surface. The following potential pathways are reviewed below:

- Well bores
- Faults and fractures
- Natural and induced seismic activity
- Prior operations
- Pipeline and surface equipment
- Lateral migration outside the NBU
- Drilling through the CO_2 area
- Diffuse leakage through the seal

4.1. Well Bores

As of January 2019, there are approximately 439 active completed wells in the NBU. About 248 of those wells are production wells and about 191 are injection wells. In addition, there are approximately 2,406 wells not in use that penetrate the reservoir, as described in Section 2.5.2 above. Leakage through existing and future well bores is a potential risk in the NBU that Perdure works to prevent by:

- adhering to regulatory requirements for well drilling and testing
- implementing best practices that Perdure has developed through its extensive operating experience
- monitoring performance of injection and production operations
- monitoring wellbore integrity and surface operations
- maintaining surface equipment

Regulations governing wells in the NBU require that wells be completed and operated so that fluids are contained in the strata in which they are encountered and that well operation does not pollute subsurface and surface waters. The regulations establish the requirements with which all wells much comply, whether they are injection, production or disposal wells. Depending on the purpose of the well, the regulatory requirements can impose additional standards for evaluation of area of review (AOR). CO_2 injection well permits are authorized only after an application, notice and opportunity for a hearing. As part of the application process, Perdure conducts an AOR that includes wells within the NBU and one-quarter mile from the set of wells considered in that AOR. Pursuant to Environmental Protection Agency regulations, all wells within the AOR that penetrated the injection interval were located and evaluated.

Regulatory requirements can also impose additional standards for mechanical integrity testing (MIT). All active injection wells must undergo a periodic MIT, depending on various dates and activities associated with the well. MIT tests include inspection of wells and associated surface facilities to ensure they are in good repair, free of leaks, and conform with various rules and permit conditions. MIT tests also include the use of a pressure recorder and pressure gauge and testing the casing-tubing annulus for a minimum amount of time at a minimum pressure.

In implementing those regulations, Perdure has developed operating procedures based on its experience as a CO_2-EOR operator. Perdure's operations include developing detailed modeling at the pattern level to guide injection pressures and performance expectations, as well as utilizing experts in diverse disciplines to operate EOR projects based on specific site characteristics. Perdure's field personnel are trained to operate wells in a manner to look for and address issues promptly, and to implement corrosion prevention techniques to protect wellbores as needed. Field personnel also are required to wear H_2S detectors and, because H_2S is entrained in the CO_2, the H_2S detector would alarm if field personnel are near equipment that leaked CO_2. Perdure's operations are designed to comply with the applicable regulations and to ensure that all fluids (including oil, water and CO_2) remain in the NBU until they are produced through a Perdure well.

New wells that are drilled into the reservoir are designed to be cemented all the way from the formation to the surface. Figure 12 (on page 20) depicts a diagram of a typical new well drilled in the NBU, and provides an example of well construction showing intervals of cement over crucial formations.

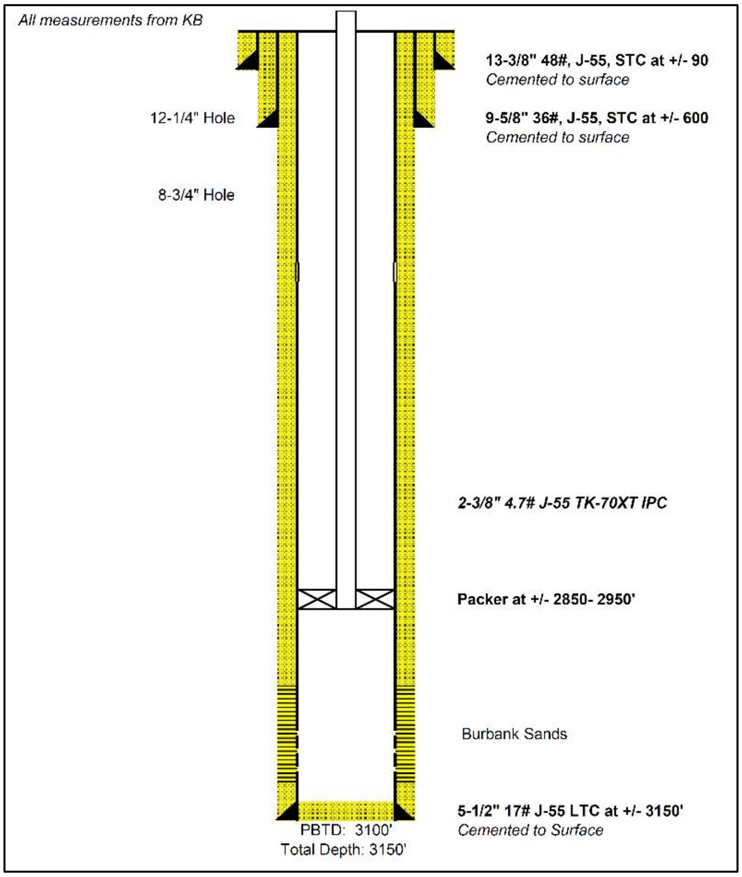

Figure 12 – Typical New Drill Well Bore Diagram

Well pressure in injection wells is monitored on a continual basis. The injection plans for each pattern are programmed into the injection WAG satellite, as discussed in Section 6.4, to govern the rate, pressure, and duration of either water or CO_2 injection. Pressure monitors on the injection wells are programmed to flag pressures that significantly deviate from the plan. Leakage on the inside or outside of the injection wellbore would affect pressure and be detected through this approach. If such excursions occur, they are investigated and addressed. It is the company's experience that few excursions result in fluid migration out of the intended zone and that leakage to the surface is very rare.

In addition to monitoring well pressure and injection performance, Perdure uses the experience gained over time to strategically approach well maintenance and updating. Perdure maintains well maintenance and workover crews onsite for this purpose. For example, well classifications by age and construction method inform Perdure's plan for monitoring and updating wells. Perdure uses all of the information at hand including pattern performance, and well characteristics to determine well maintenance schedules.

Production well performance is monitored using the production well test process conducted when produced fluids are gathered and sent to a satellite battery. There is a routine cycle for each satellite battery, with each well being tested approximately once every two months. During this cycle, each production well is diverted to the well test equipment for a period of time sufficient to measure and sample produced fluids (generally 8-12 hours). This test allows Perdure to allocate a portion of the produced fluids measured at the satellite battery to each production well, assess the composition of produced fluids by location, and assess the performance of each well. Performance data are reviewed on a routine basis to ensure that CO_2 flooding is optimized. If production is off plan, it is investigated and any identified issues addressed. Leakage to the outside of production wells is not considered a major risk because of the reduced pressure in the casing. Also, personal H_2S monitors are designed to detect leaked H_2S around production wells.

Field inspections are conducted on a routine basis by field personnel. On any day, Perdure has approximately 32 personnel in the field in the NBU, as of January 2019. Leaking CO_2 is very cold and leads to formation of bright white clouds or dry ice, either of which is easily spotted. All field personnel are trained to identify leaking CO_2 and other potential problems at wellbores and in the field. Any CO_2 leakage detected will be documented and reported, quantified and addressed as described in Section 5.

Continual and routine monitoring of well bores and site operations will be used to detect leaks, as further described in Section 6.1. Based on these activities, Perdure will mitigate the risk of CO_2 leakage through existing well bores by detecting problems as they arise and quantifying any leakage that does occur. Section 5 summarizes how CO_2 leakage from various pathways will be monitored and responded to. Section 6 describes how any such leakages will be input into the mass-balance equation.

4.2. Faults and Fractures

Other than as described in Section 2.3 above, there are no known faults or fractures in the reservoir that provide a potential pathway for upward fluid flow. Locations where oil and natural gas have been trapped in the deep subsurface provide positive proof that faults and fractures do not provide a potential pathway for upward flow of injected CO_2 from the reservoir. As described in Section 2.3, the reservoir is characterized by east-west fracturing, which results in a preferential east-west movement of injected fluids. This fact led to early adjustments of the waterflood in the 1950s, and all flooding operations since that time. The waterflood and the CO_2-EOR operations in the NBU is generally developed by injecting water/CO_2 in east-west rows of wells and producing alternate rows of wells. Water curtain injection (WCI) described in Section 2.3 is the historic method used for decades during the waterflood in the NBU to address the flow of fluids within and external to the NBU unit boundaries, and continues to be used during the CO_2-EOR flood operations. Other than as described above, there is no evidence of any interaction with existing or new faults or fractures.

Perdure has extensive experience in designing, implementing and operating EOR projects to ensure that injection pressures will not damage the oil reservoir by inducing new fractures or creating shear. Injection pressures are monitored so that injection pressures will not exceed fracture pressures, even if injection well permits authorize injection pressures that exceed fracture pressures.

4.3. Natural and Induced Seismic Activity

There is no direct evidence that natural seismic activity poses a significant risk for loss of CO_2 to the surface in the NBU.

Determining whether seismic activity is induced, or triggered by human activity, is difficult. In the past 10-15 years, northcentral Oklahoma (which includes the NBU) has experienced a significant increase in earthquakes. This increase is depicted in Figure 13, which show the earthquake densities in Oklahoma prior to 2009, and then again from 2009-2018. Osage County is outlined in blue.

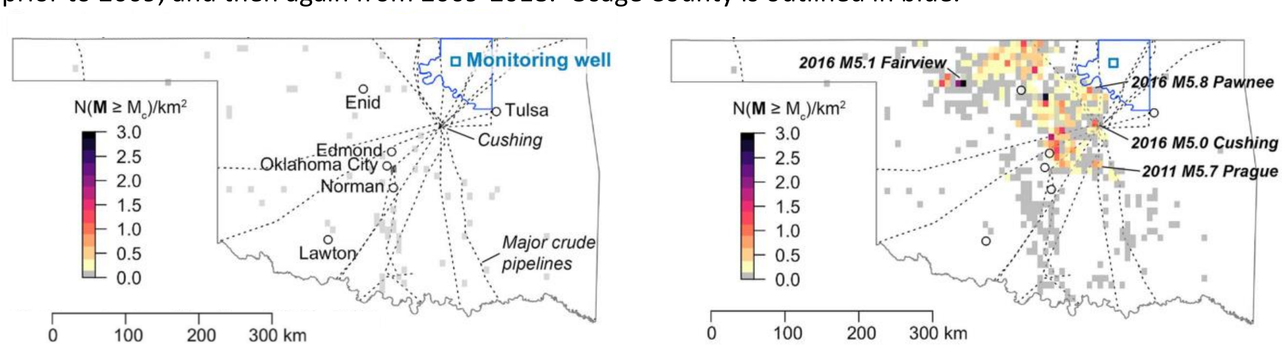

Figure 13 – Oklahoma Earthquake Densities: Prior to 2009 (left) and 2009 – 2018 (right)[22]

[22] Barbour (2019).

Over the past 10-15 years, the Cherokee Platform was targeted by many oil and gas companies for horizontal shale oil drilling. Many of these production wells, including those from the Mississippi Limestone formation, yielded significant volumes of saltwater along with the hydrocarbons, and the produced saltwater was commonly disposed of into deeper formations such as those in the Arbuckle Group. Injection of this produced saltwater into the Arbuckle, which directly overlies crystalline basement rock, has been proposed to perturb the stresses on basement faults, causing them to slip and contributing to at least some of increased density of earthquakes. However,

> "An Oklahoma seismicity map shows Osage County as an anomalously "quiet" region. Seismicity in counties surrounding Osage County experienced hundreds of earthquakes during the past couple of years, yet the area of Osage experienced less than a dozen earthquakes in the decades-long history of the Oklahoma seismic network."[23]

In a recent study focused on the injection of produced saltwater in Osage County into the Arbuckle formation, the study agreed that Osage County is a "seismically quiet location with a high density of active disposal wells".[24]

The concern about induced seismicity is that it could lead to fractures in the seal, providing a pathway for CO_2 leakage to the surface. However, the subject wells injecting produced wastewater into the Arbuckle formation are injecting fluids at approximately 3,200 feet deep, which is about 350 feet lower than the reservoir in the NBU that contains the injected CO_2. Moreover, there have been no reports of loss of injectant (wastewater or CO_2) to the surface associated with any seismic activity.

The nearest large earthquake was in Pawnee, Oklahoma in 2016, which is nearly 35 miles away from the NBU. Perdure is not aware of any reported loss of CO_2 or water to the surface in the NBU associated with any seismic activity.

Therefore, there is no direct evidence to suggest that natural seismic activity poses a significant risk for loss of CO_2 to the surface from the NBU. If induced seismicity resulted in a pathway for material amounts of CO_2 to migrate from the injection zone, then other reservoir fluid monitoring methods (such as reservoir pressure, well pressure and pattern monitoring) would lead to further investigation.

4.4. Prior Operations

In 2013, CO_2 flooding began in the NBU. Perdure and prior operators have maintained records of the NBU, including active and abandoned wells. Perdure's standard practice in drilling new wells includes a review of records to ensure that drilling will not cause damage to any nearby active or abandoned well. AOR requirements include identification of all active and abandoned wells in the AOR, and implementation of procedures to ensure integrity of active wells. Perdure and prior operators have checked for the presence of old, unknown wells throughout the NBU over many decades. These practices ensure that identified wells are sufficiently isolated and do not interfere with the CO_2 injection, enhanced oil recovery, and reservoir pressure maintenance operations. This operational experience supports the conclusions that there are no unknown wells within the NBU and that the risk of migration from older wells has been sufficiently mitigated. To Perdure's knowledge, no prior operations have impaired the CO_2 injection confining zone.

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[23] Crain (2017).
[24] Barbour (2019).

4.5. Pipeline and Surface Equipment

Leakage of CO_2 through pipelines and surface equipment in the NBU is a potential risk. The risk of unplanned losses of CO_2, including damage to or failure of pipelines and surface equipment, is reduced to the maximum extent practicable through the use of prevailing design and construction practices, routine maintenance, periodic inspection procedures as well as maintaining compliance with applicable regulations. The facilities and pipelines currently utilize and will continue to utilize materials of construction and control processes that are standard for CO_2-EOR projects in the oil and gas industry. Operating and maintenance practices currently follow and will continue to follow demonstrated industry standards. In addition, Perdure's field operations include frequent routine visual inspection of surface facilities, which will provide an additional way to detect leaks and further support Perdure's efforts to detect and remedy any leaks in a timely manner. Finally, amounts of CO_2 lost through this potential leakage pathway will be determined by: (a) following Subpart W method for estimating fugitive and vented emissions; (b) using direct metering to measure specific venting events, and (c) using engineering best practices to estimate a loss in the rare event of an extreme event.

4.6. Lateral Migration

There is a potential risk of injected CO_2 in the NBU migrating in the reservoir to an area outside the unit boundary of the NBU. However, as described in Section 2.4, the NBU waterflood design was adjusted in the 1950s to account for a preferential east-west movement of injected fluid in the reservoir. For many decades, the injection pattern in the NBU has been a north-south elongated 5-spot 20-acre pattern on alternating east-west rows. Currently, the CO_2-EOR area of the NBU is operated on 5-spot 40-acre injection patterns, with alternating east-west rows of injectors and producers. This operations method has successfully maintained injected water and CO_2 in the reservoir within the NBU unit boundary. Because Perdure has no intentions of changing this operational injection pattern, this risk of lateral migration is significantly reduced.

Water curtain injection (WCI) methods are also deployed during CO_2-EOR operations to prevent CO_2 lateral migration out of the unit boundary. As described in Section 2.3, continuous WCI operations are conducted at the NBU unit boundaries to create a pressure barrier to contain injected fluids within the NBU. WCI operations efficiently and effectively maintain and control lateral migration of fluids to assure that the CO_2 does not cross NBU unit boundaries. CO_2 injection and production operations are conducted based on lessons learned from prior operations and provide added measures of protection against any potential leakage of CO_2 from the reservoir. An earlier operator's over production of the western water curtain, described in Section 3.1, demonstrates the importance of managing WCI operations in the NBU. Upon assuming ownership of the NBU in 2017, Perdure modified the CO_2 injection and production operations to prevent over production of the water curtain on the NBU's western edge, which is downdip in the reservoir. Due to Perdure's WCI operations at the NBU unit boundaries, injected fluids (including CO_2) are maintained in the reservoir within the NBU unit boundary and do not move to adjacent areas, much like how operations were successfully conducted during decades of the waterflood (1950s-2013). As a result, it is unlikely that injected CO_2 will migrate downdip and laterally outside the NBU because of the nature of the geology and Perdure's approach used for injection.

4.7. Drilling Through the CO_2 Area

There is a risk, albeit small, that future drilling through the Burbank formation could occur and inadvertently create a leakage pathway. However, the risk is very low because of regulatory requirements, routine inspections, and operational drivers. EPA UIC regulations regarding Class II injection wells require that any fluids be contained in strata in which they are encountered.[25] In addition, Perdure's visual inspection process is designed to identify unapproved drilling activity in the NBU, especially where Perdure owns substantial portions of the surface estate. Finally, Perdure plans to conduct CO_2-EOR operations in the NBU for decades and inherently has a commercial interested in protecting the integrity of its assets and maximizing resources.

4.8. Diffuse Leakage Through the Seal

In the NBU, for CO_2 injected into the reservoir, the natural seal is the Pink Limestone member of the Cherokee formation. Diffuse leakage of the injected CO_2 through the seal is highly unlikely and improbable.

The seal is composed of several feet of salt, shale and tight carbonate. The seal is highly impermeable where unperforated, and the seal is cemented across in any horizons where the seal is perforated by wells. If CO_2 were to migrate through the seal, it would be encountered and trapped by the secondary seal which is the Oswego Limestone member of the Marmaton formation, or any of the additional shallower seals indicated in brown in Figure 4, Section 2.3 (above).

Oil and gas production in the NBU from the reservoir also confirms the successful trapping of fluids by the seal over geologic time. The natural seal is the reason the reservoir exists in the first place. Additional pressure monitoring and geo-mechanical modeling of the seal in the NBU also confirms the efficiency and integrity of the confining system.

In addition, each CO_2 injection well is assigned a maximum surface injection pressure by the EPA. This limitation is imposed as part of the EPA UIC permitting process and has the purpose of ensuring that the reservoir fracture pressure is not exceeded.

Additionally, geo-mechanical analyses were conducted using wireline logs and core tests for certain wells in the NBU. Analytical techniques were used to estimate changes in minimum horizontal stress, σh, caused by changes in pressure and temperature during CO_2 injection, and to determine whether the stress state compromises the ability of the reservoir for safe and effective CO_2 storage. It was found that fracturing of the reservoir or caprock is not likely, as long as the injection pressure is maintained below the EPA UIC permit pressure limit.

5. Monitoring

5.1. Monitoring Generally

As part of its ongoing operations, Perdure monitors and collects flow, pressure, temperature, and gas composition data from wells and facilities in the NBU, and stores that information in the company's data management system. Some information is collected electronically by equipment connected to a supervisory control and data acquisition (SCADA) system, while other information is collected manually by operations personnel physically present at the well or facility. Meters are used throughout the NBU for measurement purposes. However, accuracy of meters – even though installed, operated, maintained and calibrated according to industry standards – are inherently suspect due to variances between meters, such as factor settings, meter calibrations, operation conditions, elevation differences, changes in temperature during a day, pressure changes over short time periods, and fluid composition

[25] 40 CFR § 146.22(b)(1).

differences (especially in multi-component or multi-phase flows). The NBU includes 467 active completed injection and production wells, and a comparable number of meters, each with an acceptable range of error. This is a site-specific factor that is considered in the mass balance calculations described in Section 7.

Leakage detection for the NBU facilities includes visual inspection of wellheads and surface facilities, injection well monitoring, and Mechanical Integrity Tests (MIT). Some of the potential leakage pathways include surface equipment and wells. Detection monitoring program techniques include visual inspections, pipeline inspections, gas alarms, personal H_2S monitors, and MITs. Areas that are monitored for such leaks include the area from the injection flow meter to the injection wellhead, and from that wellhead to the injection formation. Detection of CO_2 from these potential leakage pathways are described in Section 5.2 through Section 5.5 below. While faults, fractures, formation seal and lateral migration could be additional leakage pathways, the likelihood of such leaks are highly improbable, as described in more detail in Sections 4.2, 4.6, and 4.8 above.

5.2. CO_2 Received

The amount of CO_2 received will be calculated using one or more custody-transfer meters at the point at which custody of the CO_2 is transferred to the NBU. Currently, the sole source of CO_2 received by the NBU is CO_2 from the Coffeyville CO_2 Pipeline. These custody transfers are commercial transactions that are documented. CO_2 composition is governed by the contract, and the CO_2 is periodically sampled to determine composition. Perdure uses flowmeters for measurements at custody transfer locations, and these flowmeters measure flow rate continually. Any additional CO_2 received into the NBU would be measured using similar flowmeters. No CO_2 is currently received in containers.

5.3. CO_2 Injected

The amount of injected CO_2 is calculated using the flow meter volumes at the operations meters at the outlet of the numerous compressors at the RCF, and each of the meters at each CO_2 off-take point from a CO_2 source (currently there is only one such off-take point, the Coffeyville CO_2 Pipeline).

5.4. CO_2 Produced, Entrained and Recycled

CO_2 produced is calculated using flowmeters at the production satellites and any flowmeters at the inlet of the RCF. For purposes of reporting under Subpart RR, Perdure will measure the mass of CO_2 produced through these volumetric flowmeters. For any new production facilities that may be added in the NBU (as indicated in Section 2.5.4), the mass of CO_2 produced would similarly be measured using one or more volumetric flowmeters.

CO_2 is produced as entrained (or dissolved) CO_2 in produced oil. As the oil passes through low-pressure separation to a gathering tank, a small amount of the CO_2 is released. The mass of this amount of CO_2 will be determined as described in Section 7.3 below.

Recycled CO_2 is calculated as CO_2 that is produced from the NBU, recaptured, and reinjected into the NBU. Recycled CO_2 is calculated using the flowmeters on the downstream side of the RCF.

5.5. CO_2 Emitted by Surface Leakage

Perdure uses an event-driven process to assess, address, track and (if applicable) quantify potential CO_2 leakage to the surface. Perdure will reconcile any Subpart W report[26] and results from any event-driven quantification to assure that surface leaks are not counted multiple times. The multi-layered, risk-based monitoring program for event-driven incidents has been designed to meet two objectives, in accordance with the leakage risk assessment in Section 4: (1) to detect problems before CO_2 leaks to the surface; and (2) to detect and quantify any leaks that do occur. Section 5.5.1 through Section 5.5.3 (below) discuss how this monitoring will be conducted and used to quantify the volumes of CO_2 leaked to the surface.

5.5.1. Monitoring for Potential Leakage from the Injection/Production Zone

Perdure monitors both injection into, and production from, the reservoir as a means of early identification of potential anomalies that could indicate leakage of CO_2 from the subsurface. The following surface data is routinely tracked and reported on a daily basis: injection rate (barrels of water, MCF of CO_2), production rates (barrels of oil, barrels of water, MCF of CO_2), tubing pressure (psig), casing pressure (psig), wellhead temperature (°F), and runtime (hours). At certain locations, instruments exist that collect data more frequently, but most if not all of that information is reduced to daily totals or averages which is a standard and custom in the oil and gas industry. The collected information is used primarily for operational oversight and monitoring of CO_2-EOR projects, but it is intended that this data also be used to determine when additional investigation is warranted of any potential CO_2 leakage.

Perdure uses reservoir modeling based on extensive history-matched data, as well as permit conditions and operational performance of CO_2-EOR operations by the prior operator and by Perdure, to develop daily and/or monthly injection rates, pressures, and volumes for each injection well. If injection pressure or rate measurements exceed specified set points determined as part of each pattern injection plan, then a flag is automatically generated, and operations personnel will investigate and resolve the matter. These anomalies are reviewed by operations personnel, and may include engineering personnel, to determine if CO_2 leakage is occurring. These kinds of anomalies are not necessarily indicators of leaks. Instead, they may simply indicate that injection rates and pressures are not conforming to the pattern injection plan. In many cases, flagged conditions present problems are straightforward to remedy, such as recalibration of a meter or some other minor action, and there is no threat of CO_2 leakage. If the issue is not readily resolved, a more detailed investigation is initiated, and additional Perdure personnel and perhaps industry support would provide additional assistance and evaluation. If a leak occurs, Perdure would quantify its magnitude.

In addition to developing daily and/or monthly injection plans, Perdure also uses collected data to forecast production volumes of oil, water and CO_2, both as to produced volumes and composition. Production wells are assigned to a satellite test facility and are isolated once every quarter for a daily well production test. Such tests are conducted more frequently if overall production or individual well

[26] Monitoring and QA/QC procedures specified in Subpart W will be used to estimate surface leaks from equipment in the NBU. Subpart W uses a factor-driven approach to estimate equipment leakage. Perdure evaluates and estimates leaks from equipment, the CO_2 content of produced oil, and vented CO_2 – including for CO_2 emitted from equipment leaks and vented emissions of CO_2 from surface equipment located between (a) the injection flowmeter and the injection wellhead, and (b) the production flowmeter and the production wellhead. See Section 7.5 below.

pressure data call for it, or if fewer production wells are assigned to a particular satellite test facility. Production and test data is reviewed on a periodic basis. If there is a significant deviation from past performance or forecast, then operations and engineering personnel will investigate the matter further. If the cause of the deviation cannot be resolved or understood quickly, then a more thorough investigation would be initiated. If a leak to the surface occurs, Perdure would quantify its magnitude.

If leakage in the reservoir or flood zone were detected, Perdure would deploy methods to quantify the volume of CO_2 involved. One possible method could be the use of material balance equations based on known injected quantities, and monitored pressures in the reservoir, to estimate the magnitude of the CO_2 involved.

If there is a subsurface leak of CO_2, it might not lead to a surface leak of CO_2. In the event of a subsurface CO_2 leak, Perdure would select an appropriate approach for tracking subsurface leakage to determine and quantify CO_2 leakage to the surface. To quantify CO_2 leakage to the surface, an estimate of the relevant parameters would be deployed, including the rate, concentration, and duration of the leakage. Depending on specific circumstances, these determinations may rely on engineering estimates.

In the event leakage from the subsurface occurred diffusely through the seals up to the surface, then the leaked gas would include H_2S, which would trigger the alarm on the personal monitors worn by field personnel. In the event such a leak was detected, operations and engineering personnel would determine how to address the problem. The team might use modeling, engineering estimates and direct measurements to quantify the leakage and otherwise address the matter.

5.5.2. Monitoring of Wellbores

Perdure monitors wells through continual, automated pressure monitoring in the injection zone (as described in Section 4.1), monitoring of the annular pressure in wellheads, and routine maintenance and inspection. In the event a wellbore does not sufficiently satisfy a mechanical integrity test (MIT) then the wellbore is shut-in until a satisfactory repair in implemented such as a workover. When the repair is made, another MIT is performed and upon satisfying that test, operations on the wellbore are resumed upon receipt of any necessary regulatory approval to re-establish operations again.

Leaks from wellbores would be detected through the follow-up investigation of pressure anomalies, visual inspection, or the use of personal H_2S monitors.

Anomalies in injection zone pressure may not indicate a leak, as discussed in Section 5.5.1 above. However, if an investigation is initiated, Perdure personnel and perhaps industry support would inspect the equipment in question and determine the nature of the problem. If it is a simple matter, the repair would be accomplished, and the volume of leaked CO_2 would be included in any Subpart W report for the NBU. If a more extensive repair is needed, then Perdure would determine the appropriate approach for quantifying leaked CO_2 using the relevant parameters (e.g., the rate, concentration, and duration of leakage).

Anomalies in annular pressure or other issues detected during routine maintenance inspections would be treated in a very similar manner. The equipment in question would be inspected for the purpose of determining the nature of the problem. For simple matters, the repair would be made at the time of inspection and the volume of leaked CO_2 would be included in any Subpart W report for the NBU. If a more extensive repair is needed, then Perdure would determine the appropriate approach for quantifying leaked CO_2 using the relevant parameters (e.g., the rate, concentration, and duration of leakage). One approach that would be considered is to prorate the most recently daily volume of CO_2 involved, compared against the number of hours CO_2 leaked from the system.

Because leaking CO_2 at the surface is very cold and leads to formation of bright white clouds and ice that are easily spotted, Perdure also employs a visual inspection process in the general area of the NBU to detect unexpected releases from wellbores. One aspect of the visual inspection process is that operations personnel visit NBU surface facilities on a routine basis. Such inspections may include tank volumes, equipment status and reliability, lube oil levels, pressures and flow rates in the facility, valve leaks, checking that injectors are on the proper WAG schedule and observing the facility for visible CO_2 or fluid line leaks. In the event a repair is necessary, the time to repair any leak is dependent on several factors, such as the severity of the leak, available manpower, location of the leak, and availability of materials required for the repair. Critical leaks are acted upon immediately.

In addition, Perdure uses data collected by H_2S monitors which are worn by all field personnel as a last method to detect leakage from wellbores. The H_2S monitors' detection limit is 10 ppm. If an H_2S alarm is triggered, the first response is to protect the safety of the personnel, and the next step is to safely investigate the source of the alarm. As noted previously, Perdure considers H_2S as a proxy for potential CO_2 leaks in the field. As a result, detected H_2S leaks will be investigated to determine and, if needed, quantify potential CO_2 leakage.

5.5.3. Other Potential Leakage at the Surface

Perdure will utilize the same visual inspection process and H_2S monitoring system to detect other potential leakage at the surface as it does for leakage from wellbores. Perdure utilizes routine visual inspections to detect significant loss of CO_2 to the surface. Operations personnel routinely visit surface facilities to conduct a visual inspection. Inspections may include review of tank levels, equipment status, lube oil levels, pressures and flow rates in the facility, valve leaks, ensuring that injectors are on the proper WAG schedule, and conducting a general observation of the facility for visible CO_2 or fluid line leaks. If a problem is detected, operations personnel would investigate and, if maintenance is required, perform the maintenance or supervise a work crew to perform the maintenance. In addition to the visual inspections, the results of the personal H_2S monitors worn by operations personnel will be a supplement for smaller leaks that may escape visual detection. If CO_2 leakage to the surface is detected, it will be reported to an operations personnel supervisor who will review the report and conduct a site investigation. If maintenance is required, operations personnel will perform the maintenance or supervise a work crew to perform the maintenance. The amount of any CO_2 leakage would be quantified.

5.6. Metering

Perdure follows industry standard metering protocols for custody transfers, such as those standards for accuracy and calibration issued by the API, the American Gas Association (AGA), and the Gas Processors Association (GPA), as appropriate. This approach is consistent with Section 98.444(e)(3). These meters are maintained routinely, operated continually, and will feed data directly to the centralized data collection systems. CO_2 composition is governed by contract and the CO_2 is routinely and periodically sampled to determine average composition. These custody meters provide an accurate method of measuring mass flow.

In addition to custody transfer meters, various process control meters are used in the NBU to monitor and manage in-field activities, many times on a real-time basis. These operations meters provide information used to make operational decisions but are not intended to provide the same level of accuracy as the custody-transfer meters. The level of precision and accuracy for operational meters currently satisfies the requirements for reporting in existing UIC permits. Although these meters are accurate for operational purposes, it is important to note that there is some variance between most commercial meters (on the order of 1-5%) which is additive across meters. This variance is due to differences in factory settings and meter calibration, as well as the operating conditions within the NBU or any given field. Meter elevation, changes in temperature (over the course of the day), fluid composition (especially in multi-component or multi-phase streams), and pressure can affect readings of these operational meters. Unlike some CO_2 injection operations where there are likely to be only a few injection wells and associated meters, the CO_2-EOR operations in the NBU currently involves 467 active completed injection and production wells and a comparable number of meters, each with an acceptable range of error. This is a site-specific factor that is considered in the mass balance calculations described in Section 7.

5.7. Leakage Verification

If there is a report or indication of a CO_2 leak, such as from a visual inspection, monitor, or pressure drop, a Perdure employee or supervisor will be dispatched to investigate the leak. Emergency shutdown systems will be utilized as necessary to isolate the leak. If the leak cannot be located without movement of equipment or other substantial work, further involvement of Perdure personnel or management will be involved to make a determination regarding how the leak will be located. Once the leak is located and isolated, pressure from the system will be relieved so that further investigation of the leak area can be performed, and repair work can be estimated and ultimately performed.

5.8. Leakage Quantification

Leakage of CO_2 on the surface will be estimated once leakage has been detected and confirmed. Leakage quantification will consist of a methodology selected by Perdure. Leakage estimating methods may potentially consist of modeling or engineering estimates based on operating conditions at the time of the leak, such as temperatures, pressures, volumes and hole size.

5.9. Demonstration at End of Specified Period

At the end of the Specified Period, Perdure intends to cease injecting CO_2 for the subsidiary or ancillary purpose of establishing the long-term storage of CO_2 in the NBU. After the end of the Specified Period, Perdure anticipates that it will submit a request to discontinue monitoring and reporting. The request will demonstrate that the amount of CO_2 reported under Subpart RR "is not expected to migrate in the future in a manner likely to result in surface leakage".[27]

At that time, Perdure will be able to support its request with years of data collected during the Specified Period as well as one to three (or more, if needed) years of data collected after the end of the Specified Period. This demonstration will provide the information necessary for the EPA Administrator to approve the request to discontinue monitoring and reporting. This demonstration may include, but is not limited to:

1) An assessment of CO_2 injection data for the NBU, including the total volume of CO_2 injected and stored as well as actual surface injection pressures;

[27] Section 98.441.

2) An assessment of any CO_2 leakage detected, including discussion of the estimated amount of CO_2 leaked and the distribution of emissions by leakage pathway; and
3) An assessment of reservoir pressure in the NBU that demonstrates that the reservoir pressure is stable enough to demonstrate that the injected CO_2 is not expected to migrate in a manner to create a potential leakage pathway.

6. Determination of Baselines for Monitoring CO_2 Surface Leakage

Perdure intends to use the results of daily monitoring of field conditions, operational data (including automatic data systems), routine testing, and maintenance information to identify and investigate excursions from expected performance that could indicate CO_2 leakage, and to otherwise monitor for surface leakage. In the event any of those results identify an issue where a CO_2 leak has occurred, the event will be documented, and an estimate will be made of the amount of CO_2 leaked. The event and estimate will be included in the annual RR reporting. Records of each event will be kept on file for a minimum of 3 years. The methods that Perdure intends to use include the following:

6.1. Data System.

Perdure uses onsite management and SCADA data to conduct its CO_2-EOR operations. Perdure uses data from these efforts to identify and investigate variances from expected performance that could indicate CO_2 leakage. Some CO_2 meters are installed with SCADA systems, that transmit data from the meters automatically into a data warehouse. That data, as well as other operational data collected manually, is also used for operational management and controls.

6.2. Visual Inspections.

Perdure's field personnel conduct routine weekly if not daily inspections of the NBU facilities, wells and other equipment (such as vessels, piping, and valves). These visual inspections provide an opportunity to identify issues early and to address them proactively, which may preclude leaks from happening and/or minimize any CO_2 leakage. Any visual identification of CO_2 vapor emission or ice formation will be reported and documented, and a plan will be developed and executed to correct the issue.

6.3. Personal H_2S Monitors.

All field personnel are required to wear H_2S monitors which, when alarmed at 10 ppm, trigger an immediate response to make sure that personnel are not at risk (and to verify that the monitor is working properly). Any alarm of an H_2S monitor will indicate a release of CO_2, which will be reported and documented, and a plan will be developed and executed to correct the issue.

6.4. Injection Target Rates and Pressures.

Perdure manages its CO_2-EOR operations by developing and implementing target injection rates and pressures for each CO_2 injection well. These target rates and pressures are developed based on various parameters such as historic and ongoing pattern development, WAG operations, CO_2 availability, field performance, and permit conditions. Field personnel implement the WAG schedule by manually making choke adjustments at each injection well, allowing for a physical inspection as described in Section 6.2 of the injection well during each adjustment. Typically on a daily basis, injection rates for each CO_2 injection well are reported and compared to the target rates. Injection pressures and casing pressures are monitored using SCADA equipment on each CO_2 injection well. Injection rates or pressures falling outside of the target rates or pressures to a statistically significant degree are screened to determine if they could lead to CO_2 leakage to the surface. If that screening or investigation identifies any indication of a CO_2 leakage to the surface in this manner, it will be reported and documented, and a plan will be developed and executed to correct the issue.

6.5. Production Wells.

Perdure forecasts the amount of fluids (e.g. oil, water, CO_2) that is likely to be produced from each production well in the NBU over various periods of time. Evaluation of these produced volumes, along with other data, informs operational decisions regarding management of the CO_2-EOR project, and aid in identifying possible issues that may involve CO_2 leakage. These evaluations can direct engineering and/or operational personnel to investigate matters further. If that investigation identifies that a CO_2 leak has occurred, it will be reported and documented, and a plan will be developed and executed to correct the issue.

6.6. Continuous Plant and Pipeline Monitoring.

Perdure currently owns and operates the sole CO_2 supply for the NBU, including the associated CO_2 capture, compression and dehydration facility and the CO_2 pipeline. The facility includes a monitoring program that monitors the rates and pressures at the facility and on the pipeline on a continuous basis. High and low set points are established in the program, and operators at the plant, pipeline and/or NBU are alerted if a parameter is outside the allowable window. If the flagged parameter is the delivery point on the pipeline, but no other parameter at the plant or pipeline is flagged, then the NBU field personnel are alerted so that further investigation can be conducted in the field to determine if the issue poses a leak threat.

6.7. Well Testing.

On a periodic (and in many instances an annual) basis, the NBU injection wells are leak tested for Mechanical Integrity Testing (MIT) as required by the EPA. This consists of regular monitoring of the tubing-casing annular pressure, and conducting a test that pressures up the well and wellhead to verify the well and wellhead can hold the appropriate amount of pressure. Perdure personnel monitor the pressure, and conduct the tests, in accordance with regulations and permit requirements. In the event of a loss of mechanical integrity, the subject injection well is immediately shut-in and an investigation is initiated to determine what caused the loss of mechanical integrity. If investigation of an event identifies that a CO_2 leak has occurred, it will be reported and documented, and a plan will be developed and executed to correct the issue.

7. Determination of CO_2 Volumes Stored Using Mass Balance Equations

The locations for obtaining volume data for the equations in Section 98.443 are proposed to be modified. The following subsections describe how Perdure will calculate the mass of CO_2 injected, emitted, and stored in the NBU.

7.1. Mass of CO_2 Received

Equation RR-2 will be used to calculate the mass of CO_2 received from each delivery point at the NBU ("Mass of CO_2 Received"). The volumetric flow at standard conditions will be multiplied by the CO_2 concentration and the density of the CO_2 at standard conditions to determine mass.

$$\mathrm{CO}_{2T,r} = \sum_{p=1}^{4} (Q_{r,p} - S_{r,p}) * D * C_{CO_2,p,r} \qquad \text{(Equation RR} - 2\text{)}$$

where:

$CO_{2T,r}$ = Net annual mass of CO_2 received through flow meter r (metric tons)

$Q_{r,p}$ = Quarterly volumetric flow through a receiving flow meter r in quarter p at standard conditions (standard cubic meters)

$S_{r,p}$ = Quarterly volumetric flow through a receiving flow meter r that is redelivered to another facility without being injected into a NBU well in quarter *p* (standard cubic meters)

D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682

$C_{CO_2,p,r}$ = Quarterly CO_2 concentration measurement in flow for flow meter r in quarter p (vol. percent CO_2, expressed as a decimal fraction)

p = Quarter of the year

r = Receiving flow meter(s)

All delivery of CO_2 to the NBU is currently used within the NBU and not redelivered outside of the NBU, so quarterly flow redelivered, $S_{r,p}$, is zero ("0") and will not be included in the equation during the time period of that operation. Quarterly CO_2 concentration measurement, $C_{CO_2,p,r}$, will be taken.

Equation RR-3 will be used to sum to total Mass of CO_2 Received.

$$CO_{2,RE} = \sum_{r=1}^{R} CO_{2T,r} \qquad \text{(Equation RR} - 3\text{)}$$

where:

$CO_{2,RE}$ = Total net annual mass of CO_2 received (metric tons)

$CO_{2T,r}$ = Net annual mass of CO_2 received (metric tons) as calculated in Equation RR-2 for flow meter r

r = Receiving flow meter(s)

7.2. Mass of CO_2 Injected into the Subsurface

The Mass of CO_2 Injected into the Subsurface in the NBU will be determined by Equation RR-6 as modified to be the sum of (1) the Mass of CO_2 Recycled as described below and (2) the Mass of CO_2 Received as determined in Section 7.1 above.

Equation RR-5 will be used to calculate the Mass of CO_2 Recycled using measurements taken from the volumetric flow meter(s) located on the downstream side of the RCF. Using data from these meters will be more accurate than using data at each injection well, because the latter would give an inaccurate estimate of total injection volume due to the large number of injection wells and the potential for propagation of error due to allowable calibration ranges for each meter. The Mass of CO_2 Recycled is determined as follows:

$$CO_{2,u} = \sum_{p=1}^{4} Q_{p,u} * D * C_{CO_2,p,r} \qquad \text{(Equation RR − 5)}$$

where:

$CO_{2,u}$ = Annual CO_2 mass injected as measured by flow meter(s) u (metric tons)

$Q_{p,u}$ = Quarterly volumetric flow rate measurement for flow meter(s) u in quarter p at standard conditions (standard cubic meters per quarter)

D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682

$C_{CO_2,p,u}$ = CO_2 concentration measurement in flow for flow meter(s) u in quarter p (vol. percent CO_2, expressed as a decimal fraction)

p = Quarter of the year

u = Flow meter(s)

The Mass of CO_2 Injected is the sum of (1) the Mass of CO_2 Recycled (Equation RR-5 above) and (2) the Mass of CO_2 Received (described in Section 7.1 above):

$$CO_{2,I} = CO_{2,u} + CO_2 \qquad \text{(Equation RR − 6)}$$

where:

$CO_{2,I}$ = Annual CO_2 Mass Injected (metric tons)

$CO_{2,u}$ = Annual CO_2 mass injected as measured by flow meter u (metric tons)

CO_2 = Total net annual mass of CO_2 received (metric tons)

7.3. Mass of CO_2 Produced

The Mass of CO_2 Produced in the NBU will be determined by using measurements from (1) the flow meters at the production satellites and any meters at the inlet to the RCF and (2) the custody transfer meters for oil sales. As with injection well data, using the data at each production well would give an inaccurate estimate of the total mass of CO_2 produced due to the large number of wells and the potential for propagation of error due to allowable calibration ranges for each meter.

Equation RR-8 (as modified) will be used to calculate the mass of CO_2 produced from the production wells (other than the mass of CO_2 entrained in produced oil).

$$\mathrm{CO}_{2,w} = \sum_{p=1}^{4} Q_{p,w} * D * C_{CO_2,p,w} \qquad \text{(Equation RR − 8)}$$

where:

$CO_{2,w}$ = Annual CO_2 mass produced through meter(s) w (metric tons)

$Q_{p,w}$ = Volumetric gas flow rate measurement for meter(s) w in quarter p at standard conditions (standard cubic meters)

D = Density of CO_2 at standard conditions (metric tons per standard cubic meter): 0.0018682

$C_{CO_2,p,w}$ = CO_2 concentration measurement in flow for meter(s) w in quarter p (vol. percent CO_2, expressed as a decimal fraction)

p = Quarter of the year

w = Flow meters

Equation RR-9 (as modified) is used to aggregate (1) the flow meters at the production satellites or any meters at the inlet to the RCF and (2) the custody transfer meters for oil sales.

$$\mathrm{CO}_{2,\mathrm{P}} = \sum_{w=1}^{W} CO_{2,w} + X_{oil} \qquad \text{(Equation RR} - 9\text{)}$$

where:

$CO_{2,P}$ = Total annual CO_2 mass produced through all meters in the reporting year (metric tons)

$CO_{2,w}$ = Annual CO_2 mass produced through meters w in the reporting year (metric tons)

X_{oil} = Mass of entrained CO_2 in oil in the reporting year, measured utilizing commercial meters and electronic flow measurement devices at each point of custody transfer, with such mass of CO_2 calculated by multiplying the total volumetric rate by the CO_2 concentration

w = Flow meters

7.4. Mass of CO_2 Emitted by Surface Leakage

The total annual Mass of CO_2 Emitted by Surface Leakage will be calculated and reported using an approach that is tailored to specific leakage events. Potential leakage events in a variety of settings are identified in other portions of this plan. Estimates of the mass of CO_2 Emitted by Surface Leakage will likely depend on a number of site-specific factors, including measurements, engineering estimates, emission factors, source of the leakage, nature of the leakage, and other factors. The process for quantifying leakage will entail using state of the art engineering principles or emission factors or both. It is not possible to predict in advance the types of leaks that may or will occur. However, some approaches to quantification are described in Section 5.1 above. In the event of a Surface Leakage, the mass of CO_2 Emitted would be quantified and reported, and the records would be maintained that describe the methods used to estimate or measure the Mass of CO_2 Emitted by Surface Leakage. In addition, reports under GHGRP Subpart W will be taken into consideration, and will be reconciled to ensure that surface leakage of CO_2 emissions is not double counted. Equation RR-10 will be used to calculate the Mass of CO_2 Emitted by Surface Leakage:

$$\mathrm{CO}_{2,\mathrm{E}} = \sum_{x=1}^{X} CO_{2,x} \qquad \text{(Equation RR} - 10\text{)}$$

where:

$CO_{2,E}$ = Total annual CO_2 mass emitted by surface leakage in the reporting year (metric tons)

$CO_{2,x}$ = Annual CO_2 mass emitted at leakage pathway x in the reporting year (metric tons)

x = Leakage pathway

7.5. Mass of CO_2 Sequestered

Equation RR-11 is used to calculate the Mass of CO_2 Sequestered in subsurface geologic formations in the reporting year.

$$\mathrm{CO_2} = CO_{2,I} - CO_{2,P} - CO_{2,E} - CO_{2,FI} - CO_{2,FP} \quad (\text{Equation RR} - 11)$$

where:

CO_2 = Total annual CO_2 Mass Sequestered in subsurface geologic formations at the facility in the reporting year (metric tons)

$CO_{2,I}$ = Total annual CO_2 Mass Injected in the well or group of wells covered by this source category in the reporting year (metric tons)

$CO_{2,P}$ = Total annual CO_2 Mass Produced net of CO_2 entrained in oil in the reporting year (metric tons)

$CO_{2,E}$ = Total annual CO_2 Mass Emitted by surface leakage in the reporting year (metric tons)

$CO_{2,FI}$ = Total annual CO_2 mass emitted from equipment leaks and vented emissions of CO_2 from equipment located on the surface between the flow meter used to measure injection quantity and the injection wellhead, for which a calculation procedure is provided in GHGRP Subpart W (metric tons)

$CO_{2,FP}$ = Total annual CO_2 mass emitted from equipment leaks and vented emissions of CO_2 from equipment located on the surface between the production wellhead and the flow meter used to measure production quantity, for which a calculation procedure is provided in GHGRP Subpart W (metric tons)

7.6. Cumulative Mass of CO_2 Reported as Sequestered

The total annual CO_2 Mass Sequestered in subsurface geologic formations at the facility in the reporting year, using Equation RR-11, will be summed to calculate the Cumulative Mass of CO_2 Sequestered in subsurface geologic formations.

8. Estimated Schedule for Implementation of MRV Plan

This plan will be effective as of January 1, 2019, which is also the proposed date for beginning to collect data under this plan. Other GHG reports are filed on March 31 of the year after the reporting year and it is anticipated that the Annual Subpart RR Report will be filed at the same time. As described in Section 3.3 above, it is anticipated that the MRV program will be in effect during the Specified Period, during which time the NBU will be operated with the subsidiary or ancillary purpose of establishing long-term containment of a measurable quantity of CO_2 in the reservoir at the NBU. It is anticipated that Perdure will establish that a measurable amount of CO_2 injected during the Specified Period will be stored in a manner not expected to migrate in the future in a manner likely to result in surface leakage.

At such time, a demonstration will be prepared that will supporting the long-term containment determination, and a request will be submitted to discontinue reporting under this MRV plan. See Section 98.441(b)(2)(ii).

9. Quality Assurance Program

9.1. Monitoring

The requirements of Sections 98.444(a) – (d) are incorporated into the mass balance calculations in Section 7 above. These include the following:

CO_2 Received and Injected

- The quarterly flow rate of CO_2 received by pipeline is measured with volumetric flow meter(s) at the receiving custody transfer point(s).
- The quarterly CO_2 flow rate for recycled CO_2 is measured with volumetric flow meter(s) at the outlet of the RCF.

CO_2 Produced

- The point of measurement for the quantity of CO_2 produced from oil or other fluid production wells is a volumetric flow meter directly downstream of separation, sending a stream of gas into a recycle system or end use system.
- The produced gas stream is sampled at least once per quarter immediately downstream of the flow meter used to measure flow rate of that gas stream, and the CO_2 concentration of the sample is measured.
- The quarterly flow rate of the produced gas is measured with volumetric flow meter(s) located at the inlet of the RCF.

CO_2 emissions from equipment leaks and vented emissions of CO_2

- These volumes are measured in conformance with the monitoring and QA/QC requirements specified in Subpart W.

Flow meter provisions

The volumetric flow meters used to generate data for the mass balance equations in Section 7 are:

- Operated continuously except as necessary for maintenance and calibration.
- Operated using the calibration and accuracy requirements in Section 98.3(i).
- Operated in conformance with American Petroleum Institute (API) standards.
- National Institute of Standards and Technology (NIST) traceable.

Concentration of CO_2

- As required by Section 98.444(f)(1) and as indicated in Appendix 1, CO_2 concentration is measured using an appropriate standard method. Unless stated otherwise in the annual report, the standard method will be the use of a gas analyzer, which is an industry standard practice.
- As required by Section 98.444(f)(2), all measured volumes of CO_2 for Equations RR-2, RR-5 and RR-8 in Section 7 will be converted to standard cubic meters at a temperature of 60 degrees Fahrenheit and at an absolute pressure of 1 atmosphere.

9.2. Procedures for Estimating Missing Data

In the event any of the data needed for the mass balance calculations in Section 7 is unable to be collected, then the procedures for estimating missing data in §98.445 will be used. Those procedures include the following:

- A quarterly flow rate of CO_2 received that is missing would be estimated using invoices, purchase statements, or using a representative flow rate value from the nearest previous time period.
- A quarterly CO_2 concentration of a CO_2 stream received that is missing would be estimated using invoices, purchase statements, or using a representative concentration value from the nearest previous time period.
- A quarterly quantity of CO_2 injected that is missing would be estimated using a representative quantity of CO_2 injected from the nearest previous period of time at a similar injection pressure.
- For any values associated with CO_2 emissions from equipment leaks and vented emissions of CO_2 from surface equipment at the facility that are reported in Subpart RR, missing data estimation procedures specified in Subpart W would be followed.
- The quarterly quantity of CO_2 produced from subsurface geologic formations that is missing would be estimated using a representative quantity of CO_2 produced from the nearest previous period of time.
- When estimating the amount of CO_2 (due to an interruption in data collection, mechanical failure of a meter, mechanical failure of other equipment, or otherwise), the amount of CO_2 is to be estimated by using the most recent periodic (i.e. daily) volume of CO_2 associated with the meter or equipment and calculating the proportionate volume of "missing" CO_2 based on the number of hours involved in the data gap or until meter/equipment repair.

10. MRV Plan Revisions

In the event there is a material change to the monitoring and/or operational parameters of CO_2-EOR operations in the NBU that is not anticipated in this MRV plan, or if Perdure chooses to revise the MRV plan for any other reason, the MRV plan will be revised and submitted to the EPA Administrator within 180 days as required in Section 98.448(d). The proposed revision to this MRV plan will be submitted in the same manner and format as this MRV plan.

11. Records Retention

Records will be maintained as required under Section 98.3(g) and Section 98.447(a)(1) – (6). These records may be maintained electronically, in paper copies, or both. Data will be collected from these records and aggregated as required for reporting purposes.

12. Appendices

12.1. Conversion Factors

For purposes of this MRV Plan, CO_2 volumes are stated at Oklahoma standard conditions of temperature and pressure: 60°F and 14.65 psia.[28]

[28] 52 Okla. Stat. § 52-472.

To convert these volumes into metric tons (tonnes), a density is calculated using the Span and Wagner equation of state as recommended by the EPA.[29] Density is calculated using the database of thermodynamic properties developed by the National Institute of Standards and Technology (NIST), available at http://webbook.nist.gov/chemistry/fluid/.

At State of Oklahoma standard conditions, the Span and Wagner equation of state gives a density of 0.0026417 lb-moles per cubic foot. Using a molecular weight for CO_2 of 44.00950, 2204.623 lbs/metric ton and 35.314667 ft^3/m^3, gives a CO_2 density of 5.2734289×10^{-2} MT/MCF or 0.001862294 MT/m^3.

The conversion factor 5.2734289×10^{-2} MT/MCF has been used throughout to convert CO_2 volumes to metric tons.

12.2. Acronyms

AGA – American Gas Association
AMA – Active Monitoring Area
AOR – Area of Review
API – American Petroleum Institute
BIA – US Bureau of Indian Affairs
BCF – billion cubic feet
cf – cubic feet
CO_2 – Carbon Dioxide
DOE – US Department of Energy
EOR – Enhanced Oil Recovery
EPA – US Environmental Protection Agency
GPA – Gas Processors Association
GHGRP – Greenhouse Gas Reporting Program
H_2S – Hydrogen Sulfide
LACT – Lease Automatic Custody Transfer
MIT – Mechanical Integrity Test
MMA – Maximum Monitoring Area
MCF – Thousand cubic feet
MMCF – Million cubic feet
MMP – Minimum Miscibility Pressure
MMT – Million metric tonnes
MRV – Monitoring, Reporting, and Verification
MMSTBO – Million stock tank barrels of oil
MT – Metric Ton (Tonne)
NIST – National Institute of Standards and Technology
NBU – North Burbank Unit
NGL – Natural Gas Liquid
OOIP – Original Oil-In-Place
PPM – Parts Per Million
PSIG – Pound per Square Inch, Gauge
RCF – NBU CO_2 Recycling and Compression Facility
SCADA – Supervisory Control And Data Acquisition

[29] General Technical Support Document for Injection and Geologic Sequestration of Carbon Dioxide: Subparts RR and UU, EPA Greenhouse Gas Reporting Program, Office of Air and Radiation, November 2010, pg 25.

STB – Stock Tank Barrel
UIC – Underground Injection Control
VRU – Vapor Recovery Unit
WAG – Water Alternating Gas
WCI – Water Curtain Injection

12.3. Glossary of Terms

This glossary describes some of the technical terms as they are used in this MRV plan.[30]

Contain / Containment – having the effect of keeping fluids located within in a specified portion of a geologic formation.

Dip -- Very few, if any, geologic features are perfectly horizontal. They are almost always tilted. The direction of tilt is called "dip." Dip is the angle of steepest descent measured from the horizontal plane. Moving higher up structure is moving "updip." Moving lower is "downdip." Perpendicular to dip is "strike." Moving perpendicular along a constant depth is moving along strike.

Formation -- A body of rock that is sufficiently distinctive and continuous that it can be mapped.

Permeability -- Permeability is the measure of a rock's ability to transmit fluids. Rocks that transmit fluids readily, such as sandstones, are described as permeable and tend to have many large, well-connected pores. Impermeable formations, such as shales and siltstones, tend to be finer grained or of a mixed grain size, with smaller, fewer, or less interconnected pores.

Phase -- Phase is a region of space throughout which all physical properties of a material are essentially uniform. Fluids that don't mix together segregate themselves into phases. Oil, for example, does not mix with water and forms a separate phase.

Porosity -- Porosity is the fraction of a rock that is not occupied by solid grains or minerals. Almost all rocks have spaces between rock crystals or grains that is available to be filled with a fluid, such as water, oil or gas. This space is called "pore space."

Primary recovery -- The first stage of hydrocarbon production, in which natural reservoir energy, such as gas drive, water drive or gravity drainage, displaces hydrocarbons from the reservoir, into the wellbore and up to surface. Initially, the reservoir pressure is considerably higher than the bottom hole pressure inside the wellbore. This high natural differential pressure drives hydrocarbons toward the well and up to surface. However, as the reservoir pressure declines because of production, so does the differential pressure. To reduce the bottom hole pressure or increase the differential pressure to increase hydrocarbon production, it is necessary to implement an artificial lift system, such as a rod pump, an electrical submersible pump or a gas-lift installation. Production using artificial lift is considered primary recovery. The primary recovery stage reaches its limit either when the reservoir pressure is so low that the production rates are not economical, or when the proportions of gas or water in the production stream are too high. During primary recovery, only a small percentage of the initial hydrocarbons in place are produced, typically around 10% for oil reservoirs. Primary recovery is also called primary production.

[30] For additional glossaries please see the U.S. EPA Glossary of UIC Terms (http://water.epa.gov/type/groundwater/uic/glossary.cfm) and the Schlumberger Oilfield Glossary (http://www.glossary.oilfield.slb.com/).

Saturation -- The fraction of pore space occupied by a given fluid. Oil saturation, for example, is the fraction of pore space occupied by oil.

Seal – A geologic layer (or multiple layers) of impermeable rock that serve as a barrier to prevent fluids from moving upwards to the surface.

Secondary recovery -- The second stage of hydrocarbon production during which an external fluid such as water or gas is injected into the reservoir through injection wells located in rock that has fluid communication with production wells. The purpose of secondary recovery is to maintain reservoir pressure and to displace hydrocarbons toward the wellbore. The most common secondary recovery techniques are gas injection and waterflooding.

Stratigraphic section -- A stratigraphic section is a sequence of layers of rocks in the order they were deposited.

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12.5. Reservoir-Related Publications

The NBU has been the subject of over 60 published reports, studies and articles, and the reservoir has been the object of numerous laboratory investigations and field tests of tertiary recovery. Some of the published papers, reports and other documents are listed in the References in Section 12.4 above, while many more are listed below.

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12.6. Wells

The following table presents the well name, API number, status and type for the wells in the NBU as of January 2020. The table is subject to change over time as new wells are drilled, existing wells change status, or existing wells are repurposed. The following terms are used:

- DRY refers to wells that were not produced and have been closed (plugged and abandoned)
- OIL refers to active wells that produce oil
- PA_GAS refers to gas production wells that have been closed (plugged and abandoned)
- PA_PROD refers to oil production wells that have been closed (plugged and abandoned)
- P&A_INJ refers to injection wells that have been closed (plugged and abandoned)
- P&A_UNKW refers to wells with an unknown type that have been closed (plugged and abandoned)
- SI_OIL refers to oil production wells that have been temporarily idled or shut-in
- SI_SWD refers to salt-water disposal wells that have been temporarily idled or shut-in
- SI_WINJ refers to water injection wells that have been temporarily idled or shut-in
- SI_WSW refers to water supply wells that have been temporarily idled or shut-in
- SI_WTR_SRVC refers to water service wells that have been temporarily idled or shut-in
- SWD refers to active salt-water disposal wells
- TA_INJ refers to water and CO_2 injection wells that have been temporarily abandoned
- TA_OIL refers to oil production wells that have been temporarily abandoned
- UNKNW refers to wells with an unknown status and type
- W_INJ refers to active wells that inject water
- WAG refers to active wells that inject water and CO_2
- WAG_TBD refers to wells anticipated to be drilled that inject water and CO_2

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-110-88510	4302A	SI_OIL	35-113-05572	13508W	P&A_INJ
35-113-05487	13001	SI_OIL	35-113-05573	13512	SI_OIL
35-113-05488	13002W	P&A_INJ	35-113-05574	13516W	P&A_INJ
35-113-05489	13003	OIL	35-113-05685	14002W	P&A_INJ
35-113-05490	13004W	P&A_INJ	35-113-05687	14006	OIL
35-113-05491	13005	P&A_INJ	35-113-05688	14007	SI_OIL
35-113-05493	13007	PA_PROD	35-113-06433	964	SI_WINJ
35-113-05494	13008W	P&A_INJ	35-113-07263	9303	PA_PROD
35-113-05495	13009	PA_PROD	35-113-07266	9302	PA_PROD
35-113-05496	13010W	PA_PROD	35-113-07269	9308	SI_OIL
35-113-05497	13011	PA_PROD	35-113-07271	9310	PA_PROD
35-113-05498	13012	PA_PROD	35-113-07272	9311	P&A_INJ
35-113-05499	13013	PA_PROD	35-113-07274	9313	PA_PROD
35-113-05500	13014W	PA_PROD	35-113-07275	9314	P&A_INJ
35-113-05501	13015	PA_PROD	35-113-07276	9315	P&A_INJ
35-113-05502	13016W	P&A_INJ	35-113-07277	9316	PA_PROD
35-113-05503	13007A	PA_PROD	35-113-07279	932	PA_GAS
35-113-05504	13017W	PA_PROD	35-113-07281	934	PA_PROD
35-113-05506	13305	SI_OIL	35-113-07282	9217	SI_OIL
35-113-05507	13306W	P&A_INJ	35-113-07283	9317	P&A_INJ
35-113-05508	13307	P&A_INJ	35-113-07284	9318W	SI_WINJ
35-113-05545	13605AW	SI_WINJ	35-113-07285	10002A	SI_OIL
35-113-05546	13614	SI_OIL	35-113-07286	10011	SI_OIL
35-113-05547	13615	SI_OIL	35-113-07287	10106A	OIL
35-113-05548	13617W	P&A_INJ	35-113-07292	9101	PA_PROD
35-113-05549	13813	PA_PROD	35-113-07293	9102	PA_PROD
35-113-05550	13903	SI_OIL	35-113-07294	9103	PA_PROD
35-113-05551	13601W	PA_PROD	35-113-07295	9104	PA_PROD
35-113-05552	13602	PA_PROD	35-113-07296	9105	PA_PROD
35-113-05553	13603W	P&A_INJ	35-113-07319	10801	PA_PROD
35-113-05554	13604	OIL	35-113-07320	10802	PA_PROD
35-113-05555	13605	PA_PROD	35-113-07321	10803	PA_PROD
35-113-05556	13606W	P&A_INJ	35-113-07322	10804	PA_PROD
35-113-05557	13607W	PA_PROD	35-113-07323	10805	PA_PROD
35-113-05558	13608W	P&A_INJ	35-113-07324	10803AW	SI_WINJ
35-113-05559	13609W	P&A_INJ	35-113-07325	10806	SI_OIL
35-113-05560	13610	SI_OIL	35-113-07326	10807	PA_PROD
35-113-05561	13611	PA_PROD	35-113-07412	1079	SI_OIL
35-113-05562	13612W	P&A_INJ	35-113-07413	1062	PA_PROD
35-113-05563	13706	PA_PROD	35-113-07414	10610	PA_PROD
35-113-05571	13504	SI_OIL	35-113-07415	1077	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07416	10608	PA_PROD	35-113-07457	10503	PA_PROD
35-113-07417	10609	PA_PROD	35-113-07458	10504	PA_PROD
35-113-07418	10602	PA_PROD	35-113-07459	10505	PA_PROD
35-113-07419	10603	PA_PROD	35-113-07460	10506	PA_PROD
35-113-07420	10605	PA_PROD	35-113-07461	10507	P&A_INJ
35-113-07421	10606	PA_PROD	35-113-07462	10508	PA_PROD
35-113-07422	10611	PA_PROD	35-113-07463	10509	PA_PROD
35-113-07423	10612	PA_PROD	35-113-07464	10510	PA_PROD
35-113-07424	10613	PA_PROD	35-113-07465	10511	OIL
35-113-07425	10614	P&A_INJ	35-113-07466	10512	PA_PROD
35-113-07426	9801	PA_PROD	35-113-07467	10513	PA_PROD
35-113-07427	9802	PA_PROD	35-113-07468	10514	PA_PROD
35-113-07428	9803	PA_PROD	35-113-07469	10515	SI_OIL
35-113-07429	9804	PA_PROD	35-113-07470	10516	PA_PROD
35-113-07430	9805	PA_PROD	35-113-07471	9601	PA_PROD
35-113-07431	9806	PA_PROD	35-113-07472	9602	PA_PROD
35-113-07432	9807	PA_PROD	35-113-07473	9603	PA_PROD
35-113-07433	9808	PA_PROD	35-113-07474	9604	SI_OIL
35-113-07434	9809	P&A_INJ	35-113-07475	9605	SI_OIL
35-113-07435	9810	PA_PROD	35-113-07476	9606	SI_OIL
35-113-07436	9811	PA_PROD	35-113-07477	9607	PA_PROD
35-113-07437	9812	PA_PROD	35-113-07478	9608	PA_PROD
35-113-07438	9813	P&A_INJ	35-113-07479	9609	PA_PROD
35-113-07439	9814	PA_PROD	35-113-07480	9610	PA_PROD
35-113-07440	9815	PA_PROD	35-113-07481	9611	PA_PROD
35-113-07441	9816	PA_PROD	35-113-07482	9612	PA_PROD
35-113-07442	10701	PA_PROD	35-113-07483	9613	PA_PROD
35-113-07443	10702	PA_PROD	35-113-07484	9614	PA_PROD
35-113-07444	10703	P&A_INJ	35-113-07485	9615	PA_PROD
35-113-07445	1064	PA_PROD	35-113-07486	9616	SI_OIL
35-113-07446	10705	PA_PROD	35-113-07487	9714A	SI_OIL
35-113-07447	10706	PA_PROD	35-113-07488	10409A	PA_PROD
35-113-07448	10707	PA_PROD	35-113-07489	9404A	PA_PROD
35-113-07449	10708	PA_PROD	35-113-07490	9406	P&A_INJ
35-113-07450	10709	PA_PROD	35-113-07491	9418	PA_PROD
35-113-07451	10711	PA_PROD	35-113-07492	10305A	PA_PROD
35-113-07452	10712	PA_PROD	35-113-07493	9501	PA_PROD
35-113-07453	9803A	PA_PROD	35-113-07494	9502	PA_PROD
35-113-07454	9805A	PA_PROD	35-113-07495	9504	SI_OIL
35-113-07455	10501	PA_PROD	35-113-07496	9503	PA_PROD
35-113-07456	10502	OIL	35-113-07497	9503A	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07498	9505	PA_PROD	35-113-07538	9516	PA_PROD
35-113-07499	9506	PA_PROD	35-113-07539	9417	PA_PROD
35-113-07500	9507	PA_PROD	35-113-07542	10901	PA_PROD
35-113-07501	9508	PA_PROD	35-113-07543	10902	PA_PROD
35-113-07502	9509W	W_INJ	35-113-07544	10903	PA_PROD
35-113-07503	9510	PA_PROD	35-113-07545	10904	SI_OIL
35-113-07504	9511	PA_PROD	35-113-07546	10905	PA_PROD
35-113-07505	9512	PA_PROD	35-113-07547	10906	PA_PROD
35-113-07506	9513	SI_OIL	35-113-07548	10907	PA_PROD
35-113-07507	9514	PA_PROD	35-113-07562	10908W	PA_PROD
35-113-07508	9515W	P&A_INJ	35-113-07563	10909	SI_OIL
35-113-07509	9516	SI_OIL	35-113-07564	10911	SI_OIL
35-113-07510	1028	SI_OIL	35-113-07565	10913	SI_OIL
35-113-07511	10211W	P&A_INJ	35-113-07566	11009	SI_OIL
35-113-07512	10215	PA_PROD	35-113-07567	11011	PA_PROD
35-113-07513	10203	SI_OIL	35-113-07568	11012W	SI_WINJ
35-113-07514	10204	PA_PROD	35-113-07569	11603	PA_PROD
35-113-07515	10205	PA_PROD	35-113-07570	11604W	P&A_INJ
35-113-07516	10206	PA_PROD	35-113-07571	11605W	P&A_INJ
35-113-07517	10207	PA_PROD	35-113-07572	11606	PA_PROD
35-113-07518	10208	PA_PROD	35-113-07573	11607	PA_PROD
35-113-07519	10209	PA_PROD	35-113-07574	11608	PA_PROD
35-113-07520	10210	PA_PROD	35-113-07575	11609	PA_PROD
35-113-07521	10212	PA_PROD	35-113-07576	11610	SI_OIL
35-113-07522	10213	SI_OIL	35-113-07577	11611	P&A_INJ
35-113-07523	10214	PA_PROD	35-113-07578	11612	SI_OIL
35-113-07524	10216	PA_PROD	35-113-07579	11601A	SI_OIL
35-113-07525	9401W	SI_WINJ	35-113-07602	12001	PA_PROD
35-113-07526	9402	PA_PROD	35-113-07603	12002W	W_INJ
35-113-07527	9402W	SI_WINJ	35-113-07604	12003	PA_PROD
35-113-07528	9403	SI_OIL	35-113-07605	12004	P&A_INJ
35-113-07529	9404W	P&A_INJ	35-113-07606	12005W	P&A_INJ
35-113-07530	9405	PA_PROD	35-113-07607	12006	PA_PROD
35-113-07530	9405A	SI_OIL	35-113-07608	12007	P&A_INJ
35-113-07531	9409	PA_PROD	35-113-07609	12008	PA_PROD
35-113-07532	9410W	W_INJ	35-113-07610	12009	PA_PROD
35-113-07533	9411	PA_PROD	35-113-07611	12010W	W_INJ
35-113-07534	9412	PA_PROD	35-113-07612	12011W	P&A_INJ
35-113-07535	9413	PA_PROD	35-113-07613	12012	OIL
35-113-07536	9414	PA_PROD	35-113-07614	12013	SI_OIL
35-113-07537	9415	SI_OIL	35-113-07615	12014	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07616	12015W	P&A_INJ	35-113-07657	11401AW	P&A_INJ
35-113-07617	12016	PA_PROD	35-113-07658	11801	P&A_INJ
35-113-07618	11301	DRY	35-113-07659	11802	P&A_INJ
35-113-07619	11302	PA_PROD	35-113-07660	11803	PA_PROD
35-113-07620	11303W	P&A_INJ	35-113-07661	11804	OIL
35-113-07621	11304	PA_PROD	35-113-07662	11805W	W_INJ
35-113-07622	11305	PA_PROD	35-113-07663	11806	P&A_INJ
35-113-07623	11306	PA_PROD	35-113-07664	11807	PA_PROD
35-113-07624	11307	PA_PROD	35-113-07665	11808	PA_PROD
35-113-07625	11308W	P&A_INJ	35-113-07666	11809	PA_PROD
35-113-07626	11309	P&A_INJ	35-113-07667	11810W	P&A_INJ
35-113-07627	11901	PA_PROD	35-113-07668	11811	PA_PROD
35-113-07628	11902	PA_PROD	35-113-07669	11812W	P&A_INJ
35-113-07629	11903W	P&A_INJ	35-113-07670	11813	PA_PROD
35-113-07630	11904	SI_OIL	35-113-07671	11814	P&A_INJ
35-113-07631	11905	PA_PROD	35-113-07672	11815	PA_PROD
35-113-07632	11906	PA_PROD	35-113-07673	11116	PA_PROD
35-113-07633	11907	OIL	35-113-07674	11201	PA_PROD
35-113-07634	11908	PA_PROD	35-113-07675	11202	PA_PROD
35-113-07635	11909W	P&A_INJ	35-113-07676	11203	PA_PROD
35-113-07636	11910W	W_INJ	35-113-07677	11204	PA_PROD
35-113-07637	11911	P&A_INJ	35-113-07678	11205	OIL
35-113-07638	11912	PA_PROD	35-113-07679	11206W	SI_WINJ
35-113-07639	11913	PA_PROD	35-113-07680	11207	OIL
35-113-07640	11401	PA_PROD	35-113-07681	11208	PA_PROD
35-113-07641	11402	PA_PROD	35-113-07682	11209	PA_PROD
35-113-07642	11403	PA_PROD	35-113-07683	11103	PA_PROD
35-113-07643	11404	PA_PROD	35-113-07684	11211W	W_INJ
35-113-07644	11405	PA_PROD	35-113-07685	11212	P&A_INJ
35-113-07645	11406	PA_PROD	35-113-07686	11213	PA_PROD
35-113-07646	11407	PA_PROD	35-113-07687	11214	PA_PROD
35-113-07647	11408	PA_PROD	35-113-07688	11215	PA_PROD
35-113-07648	11409	P&A_INJ	35-113-07689	11216	P&A_INJ
35-113-07649	11410	PA_PROD	35-113-07690	11101	PA_PROD
35-113-07650	11303	DRY	35-113-07691	11102	PA_PROD
35-113-07651	11401A	PA_PROD	35-113-07692	11103W	W_INJ
35-113-07652	12006A	P&A_INJ	35-113-07693	11104	PA_PROD
35-113-07653	12008A	P&A_INJ	35-113-07694	11105	PA_PROD
35-113-07654	12009A	P&A_INJ	35-113-07695	11106	PA_PROD
35-113-07655	12014A	OIL	35-113-07696	11107	PA_PROD
35-113-07656	12016A	SI_OIL	35-113-07697	11108	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07698	11109	PA_PROD	35-113-07773	14504	PA_PROD
35-113-07699	11710	OIL	35-113-07775	12701	PA_PROD
35-113-07700	11110	PA_PROD	35-113-07776	12702	PA_PROD
35-113-07701	11111	PA_PROD	35-113-07777	12703	SI_OIL
35-113-07702	11112	PA_PROD	35-113-07778	12704	SI_OIL
35-113-07703	11113	OIL	35-113-07779	12705	PA_PROD
35-113-07704	11114	SI_OIL	35-113-07780	12706	PA_PROD
35-113-07705	11115W	P&A_INJ	35-113-07781	12707	PA_PROD
35-113-07707	11701	PA_PROD	35-113-07782	12708	PA_PROD
35-113-07708	11702	PA_PROD	35-113-07783	12709	PA_PROD
35-113-07709	11704	P&A_INJ	35-113-07784	12710	P&A_INJ
35-113-07710	11705	OIL	35-113-07785	12711	PA_PROD
35-113-07711	11706	PA_PROD	35-113-07786	12712	PA_PROD
35-113-07712	11707W	P&A_INJ	35-113-07787	12713	PA_PROD
35-113-07713	11709W	W_INJ	35-113-07788	12814	SI_OIL
35-113-07714	11711W	P&A_INJ	35-113-07789	12715	PA_PROD
35-113-07715	11712	SI_OIL	35-113-07790	12716	SI_OIL
35-113-07716	11713W	P&A_INJ	35-113-07791	12801	PA_PROD
35-113-07717	11714	PA_PROD	35-113-07792	12802	OIL
35-113-07718	11715W	P&A_INJ	35-113-07793	12803	OIL
35-113-07719	11716	PA_PROD	35-113-07794	12804	PA_PROD
35-113-07720	11501	PA_PROD	35-113-07795	12805	OIL
35-113-07721	11502	PA_PROD	35-113-07796	12806	SI_OIL
35-113-07722	11503	PA_PROD	35-113-07797	12807	PA_PROD
35-113-07723	11504	DRY	35-113-07798	12808A	PA_PROD
35-113-07724	11505	P&A_INJ	35-113-07799	12809	SI_OIL
35-113-07725	11506	PA_PROD	35-113-07800	12810	P&A_INJ
35-113-07726	12101	PA_PROD	35-113-07801	12811W	SI_WINJ
35-113-07727	12102W	P&A_INJ	35-113-07802	12812	PA_PROD
35-113-07728	12103	PA_PROD	35-113-07803	12813W	P&A_INJ
35-113-07729	12104W	P&A_INJ	35-113-07804	12814	PA_PROD
35-113-07730	12105W	P&A_INJ	35-113-07805	12815	PA_PROD
35-113-07765	12501	PA_PROD	35-113-07806	12301	PA_PROD
35-113-07766	12502W	P&A_INJ	35-113-07807	12302	OIL
35-113-07767	12503	PA_PROD	35-113-07808	12303	PA_PROD
35-113-07767	12503A	PA_PROD	35-113-07809	12304W	P&A_INJ
35-113-07768	12504	PA_PROD	35-113-07810	12305W	P&A_INJ
35-113-07769	12505	P&A_INJ	35-113-07811	12306	PA_PROD
35-113-07770	14501	PA_PROD	35-113-07812	12307	OIL
35-113-07771	14502	PA_PROD	35-113-07813	12308W	P&A_INJ
35-113-07772	14503	PA_PROD	35-113-07814	12309	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-07815	12311	P&A_INJ	35-113-07856	12204W	W_INJ
35-113-07816	12312W	P&A_INJ	35-113-07857	12205W	P&A_INJ
35-113-07817	12313	PA_PROD	35-113-07858	12206W	P&A_INJ
35-113-07818	12314W	P&A_INJ	35-113-07859	12207W	W_INJ
35-113-07819	12315	PA_PROD	35-113-07860	12208	PA_PROD
35-113-07820	12316	PA_PROD	35-113-07861	12209W	P&A_INJ
35-113-07821	12310	PA_PROD	35-113-07862	12211W	P&A_INJ
35-113-07822	12401	PA_PROD	35-113-07863	12212	PA_PROD
35-113-07823	12402	PA_PROD	35-113-07864	12213W	P&A_INJ
35-113-07824	12403	SI_OIL	35-113-07865	12214	OIL
35-113-07825	12405W	P&A_INJ	35-113-07866	12215	SI_OIL
35-113-07826	12406W	P&A_INJ	35-113-07867	12216	PA_PROD
35-113-07827	12407	PA_PROD	35-113-07868	14401	PA_PROD
35-113-07828	12408W	W_INJ	35-113-07869	14402	PA_PROD
35-113-07829	12409	OIL	35-113-07870	14403	PA_PROD
35-113-07830	12410W	W_INJ	35-113-07871	14404	PA_PROD
35-113-07831	12411W	W_INJ	35-113-07872	14405	PA_PROD
35-113-07832	12412W	P&A_INJ	35-113-07873	14406	SI_OIL
35-113-07833	12413	PA_PROD	35-113-07884	12207A	SI_OIL
35-113-07834	12404	PA_PROD	35-113-07885	12608W	P&A_INJ
35-113-07835	12301AW	W_INJ	35-113-07886	12609	SI_OIL
35-113-07836	12316W	P&A_INJ	35-113-07887	12615	SI_OIL
35-113-07837	12401A	SI_OIL	35-113-07888	12616	P&A_INJ
35-113-07838	12804W	P&A_INJ	35-113-07889	14401A	PA_PROD
35-113-07839	12414	PA_PROD	35-113-07890	14402A	PA_PROD
35-113-07840	12416W	P&A_INJ	35-113-07891	14406W	P&A_INJ
35-113-07841	12808W	P&A_INJ	35-113-07892	14408	PA_PROD
35-113-07842	12601	P&A_INJ	35-113-07893	14409	SI_OIL
35-113-07843	12602	PA_PROD	35-113-07894	14412	PA_PROD
35-113-07844	12603	OIL	35-113-07895	14413	PA_PROD
35-113-07845	12604	PA_PROD	35-113-07896	14414	PA_PROD
35-113-07846	12605	SI_OIL	35-113-07942	13209	PA_PROD
35-113-07847	12606	SI_OIL	35-113-07994	12902	OIL
35-113-07848	12610	SI_OIL	35-113-07995	12903	SI_OIL
35-113-07849	12611W	W_INJ	35-113-07996	12904	PA_PROD
35-113-07850	12612	PA_PROD	35-113-07997	12905W	W_INJ
35-113-07851	12613W	P&A_INJ	35-113-07998	12906W	P&A_INJ
35-113-07852	12614	SI_OIL	35-113-07999	12907	PA_PROD
35-113-07853	12201W	P&A_INJ	35-113-08000	12908W	W_INJ
35-113-07854	12202	OIL	35-113-08001	12909	OIL
35-113-07855	12203W	P&A_INJ	35-113-08002	12910	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08003	12911	P&A_INJ	35-113-08053	502	SI_OIL
35-113-08004	12912	SI_OIL	35-113-08054	521W	P&A_INJ
35-113-08005	12913	PA_PROD	35-113-08055	522W	P&A_INJ
35-113-08006	12914	SI_OIL	35-113-08056	523W	P&A_INJ
35-113-08007	13201W	SI_WINJ	35-113-08057	524W	P&A_INJ
35-113-08008	13202	SI_OIL	35-113-08058	526W	P&A_INJ
35-113-08010	13204	PA_PROD	35-113-08059	527W	W_INJ
35-113-08011	13207	PA_PROD	35-113-08060	528W	P&A_INJ
35-113-08012	13208	SI_OIL	35-113-08061	201	PA_PROD
35-113-08013	13211W	SI_WINJ	35-113-08062	202	DRY
35-113-08022	702	PA_PROD	35-113-08063	203	DRY
35-113-08023	703	PA_PROD	35-113-08064	204	DRY
35-113-08024	705	PA_PROD	35-113-08065	205	DRY
35-113-08025	706	DRY	35-113-08067	503	OIL
35-113-08026	613	PA_PROD	35-113-08068	401	PA_PROD
35-113-08027	616	DRY	35-113-08069	407	PA_PROD
35-113-08028	601	OIL	35-113-08070	104	PA_PROD
35-113-08029	611	OIL	35-113-08074	301	OIL
35-113-08030	621W	P&A_INJ	35-113-08075	302	OIL
35-113-08031	622W	P&A_INJ	35-113-08076	303	OIL
35-113-08032	623W	WAG	35-113-08077	304	SI_OIL
35-113-08033	624W	P&A_INJ	35-113-08078	305W	SI_WINJ
35-113-08034	625W	P&A_INJ	35-113-08079	306A	SI_OIL
35-113-08035	721W	P&A_INJ	35-113-08080	307	PA_PROD
35-113-08036	207	PA_PROD	35-113-08085	308	SI_OIL
35-113-08037	106	SI_OIL	35-113-08086	309	SI_OIL
35-113-08038	107W	DRY	35-113-08087	310	OIL
35-113-08039	525W	P&A_INJ	35-113-08088	322W	P&A_INJ
35-113-08040	104A	SI_OIL	35-113-08089	323W	W_INJ
35-113-08041	401A	OIL	35-113-08090	324W	W_INJ
35-113-08042	409	OIL	35-113-08091	325W	P&A_INJ
35-113-08043	410	OIL	35-113-08092	326W	W_INJ
35-113-08044	411	OIL	35-113-08093	327W	SI_WINJ
35-113-08045	421W	P&A_INJ	35-113-08094	328W	W_INJ
35-113-08046	422W	WAG	35-113-08095	801	OIL
35-113-08047	423W	P&A_INJ	35-113-08096	1401	OIL
35-113-08048	424W	P&A_INJ	35-113-08097	803	OIL
35-113-08049	425W	P&A_INJ	35-113-08098	804	OIL
35-113-08050	426W	W_INJ	35-113-08099	805	PA_PROD
35-113-08051	427W	P&A_INJ	35-113-08100	806	OIL
35-113-08052	428W	W_INJ	35-113-08101	807	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08102	808	P&A_INJ	35-113-08143	1024W	P&A_INJ
35-113-08103	809	P&A_INJ	35-113-08144	1025W	WAG
35-113-08104	810W	W_INJ	35-113-08145	1026W	P&A_INJ
35-113-08105	811	OIL	35-113-08146	1027W	WAG
35-113-08106	812W	TA_OIL	35-113-08147	1028W	P&A_INJ
35-113-08107	813	PA_PROD	35-113-08148	1510A	OIL
35-113-08108	816	OIL	35-113-08149	1521W	WAG
35-113-08109	822W	P&A_INJ	35-113-08150	1522W	WAG
35-113-08110	823W	P&A_INJ	35-113-08151	1523W	P&A_INJ
35-113-08111	824W	P&A_INJ	35-113-08152	1524W	P&A_INJ
35-113-08112	826W	P&A_INJ	35-113-08153	1525W	WAG
35-113-08113	827W	P&A_INJ	35-113-08154	1526W	P&A_INJ
35-113-08114	828W	WAG	35-113-08155	1527W	WAG
35-113-08115	1422W	W_INJ	35-113-08156	1528W	P&A_INJ
35-113-08116	1427W	P&A_INJ	35-113-08157	1621W	P&A_INJ
35-113-08117	902	OIL	35-113-08158	1622W	P&A_INJ
35-113-08118	903	PA_PROD	35-113-08159	1623W	P&A_INJ
35-113-08119	904	OIL	35-113-08160	1624W	WAG
35-113-08120	905	PA_PROD	35-113-08161	1625W	WAG
35-113-08121	906	PA_PROD	35-113-08162	1626W	P&A_INJ
35-113-08122	907	PA_PROD	35-113-08163	1627W	WAG
35-113-08123	908	OIL	35-113-08164	1017	DRY
35-113-08124	909	PA_PROD	35-113-08165	1517W	P&A_INJ
35-113-08125	910	P&A_INJ	35-113-08166	1121W	P&A_INJ
35-113-08126	911	SI_OIL	35-113-08167	1122W	P&A_INJ
35-113-08127	912	OIL	35-113-08168	1123W	WAG
35-113-08128	913	PA_PROD	35-113-08169	1124W	P&A_INJ
35-113-08129	914	PA_PROD	35-113-08170	1125W	P&A_INJ
35-113-08130	915	P&A_INJ	35-113-08171	1126W	WAG
35-113-08131	916	OIL	35-113-08172	1127W	P&A_INJ
35-113-08132	921W	WAG	35-113-08173	1128W	WAG
35-113-08133	922W	P&A_INJ	35-113-08174	1221W	WAG
35-113-08134	923W	WAG	35-113-08175	1222W	P&A_INJ
35-113-08135	924W	PA_PROD	35-113-08176	1223W	W_INJ
35-113-08136	925W	WAG	35-113-08177	1224W	P&A_INJ
35-113-08137	926W	P&A_INJ	35-113-08178	1225W	WAG
35-113-08138	927W	WAG	35-113-08179	1226W	P&A_INJ
35-113-08139	928W	P&A_INJ	35-113-08180	1227W	P&A_INJ
35-113-08140	1021W	P&A_INJ	35-113-08181	1721W	P&A_INJ
35-113-08141	1022W	P&A_INJ	35-113-08182	1722W	P&A_INJ
35-113-08142	1023W	WAG	35-113-08183	1723W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08184	1724W	WAG	35-113-08226	2621W	P&A_INJ
35-113-08185	1725W	P&A_INJ	35-113-08227	2622W	P&A_INJ
35-113-08186	1726W	P&A_INJ	35-113-08228	2623W	P&A_INJ
35-113-08187	1727W	P&A_INJ	35-113-08229	2624W	P&A_INJ
35-113-08188	1728W	P&A_INJ	35-113-08230	2625W	WAG
35-113-08189	1821W	WAG	35-113-08231	2626	P&A_INJ
35-113-08190	1822W	P&A_INJ	35-113-08232	2627W	P&A_INJ
35-113-08191	1823	P&A_INJ	35-113-08233	2628W	SI_WINJ
35-113-08192	1825W	P&A_INJ	35-113-08234	3321W	PA_PROD
35-113-08193	1826W	P&A_INJ	35-113-08235	3323W	PA_PROD
35-113-08194	1827W	P&A_INJ	35-113-08236	3325W	P&A_INJ
35-113-08195	1828W	W_INJ	35-113-08237	3327W	P&A_INJ
35-113-08196	1802	P&A_INJ	35-113-08238	3404	PA_PROD
35-113-08197	1803	OIL	35-113-08238	3404A	OIL
35-113-08198	1804	PA_PROD	35-113-08239	3421W	P&A_INJ
35-113-08199	1805	P&A_INJ	35-113-08240	3423W	P&A_INJ
35-113-08200	1806	P&A_INJ	35-113-08241	3425W	WAG
35-113-08201	1807	P&A_INJ	35-113-08242	3427W	P&A_INJ
35-113-08202	1808	OIL	35-113-08243	2601	OIL
35-113-08204	1810	OIL	35-113-08244	2602	OIL
35-113-08205	1811	OIL	35-113-08245	2603	OIL
35-113-08206	1812	OIL	35-113-08246	2604	OIL
35-113-08207	1813	PA_PROD	35-113-08247	2605	W_INJ
35-113-08208	1814	OIL	35-113-08248	2606	PA_PROD
35-113-08209	1815	OIL	35-113-08249	2607W	P&A_INJ
35-113-08210	1816	P&A_INJ	35-113-08250	2608	PA_PROD
35-113-08211	1801	OIL	35-113-08251	2609	P&A_INJ
35-113-08212	1209	OIL	35-113-08252	2610	PA_PROD
35-113-08213	1210	OIL	35-113-08253	2611	OIL
35-113-08214	1217	P&A_INJ	35-113-08254	2612	PA_PROD
35-113-08215	2502A	OIL	35-113-08255	2613	OIL
35-113-08216	2503A	OIL	35-113-08256	2614	OIL
35-113-08217	2511A	OIL	35-113-08257	2615	PA_PROD
35-113-08218	2521W	WAG	35-113-08258	2616	SI_WINJ
35-113-08219	2522W	P&A_INJ	35-113-08259	2501	OIL
35-113-08220	2523W	P&A_INJ	35-113-08261	2503	PA_PROD
35-113-08221	2524W	WAG	35-113-08262	2504	PA_PROD
35-113-08222	2525W	P&A_INJ	35-113-08263	2505	PA_PROD
35-113-08223	2526W	P&A_INJ	35-113-08264	2506	PA_PROD
35-113-08224	2527W	P&A_INJ	35-113-08265	2507	PA_PROD
35-113-08225	2528W	P&A_INJ	35-113-08266	2508	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08268	2510	PA_PROD	35-113-08312	3206	PA_PROD
35-113-08269	2511	PA_PROD	35-113-08313	3203	OIL
35-113-08270	2512	PA_PROD	35-113-08314	3208	PA_PROD
35-113-08271	2513	PA_PROD	35-113-08315	3209	PA_PROD
35-113-08272	2514	PA_PROD	35-113-08316	3210	PA_PROD
35-113-08273	2515	OIL	35-113-08317	3211	SI_OIL
35-113-08275	3401	PA_PROD	35-113-08318	3212	PA_PROD
35-113-08276	3402	OIL	35-113-08319	3213	PA_PROD
35-113-08277	3403	PA_PROD	35-113-08320	3214	PA_PROD
35-113-08277	3403A	OIL	35-113-08321	3215	OIL
35-113-08279	3405W	P&A_INJ	35-113-08322	3216	OIL
35-113-08280	3406	PA_PROD	35-113-08323	3101A	OIL
35-113-08281	3407	PA_PROD	35-113-08324	3101	PA_PROD
35-113-08282	3408	PA_PROD	35-113-08325	3102	OIL
35-113-08283	3409	PA_PROD	35-113-08326	3103	OIL
35-113-08284	3410	OIL	35-113-08327	3104	DRY
35-113-08285	3411	OIL	35-113-08328	3104A	OIL
35-113-08286	3412	OIL	35-113-08329	3105	PA_PROD
35-113-08287	3413	PA_PROD	35-113-08330	3106	OIL
35-113-08288	3414	PA_PROD	35-113-08331	3107	PA_PROD
35-113-08289	3415	PA_PROD	35-113-08332	3108	PA_PROD
35-113-08290	3416	PA_PROD	35-113-08333	3109	PA_PROD
35-113-08291	3301	OIL	35-113-08334	3110	PA_PROD
35-113-08292	3302	OIL	35-113-08335	3111	OIL
35-113-08293	3303	OIL	35-113-08336	3112	PA_PROD
35-113-08294	3304	OIL	35-113-08337	3113	PA_PROD
35-113-08295	3305	PA_PROD	35-113-08338	3114	PA_PROD
35-113-08296	3306	OIL	35-113-08339	3115	OIL
35-113-08297	3307	PA_PROD	35-113-08340	3116	OIL
35-113-08298	3308	PA_PROD	35-113-08341	2301	OIL
35-113-08300	3310	PA_PROD	35-113-08342	2302A	OIL
35-113-08301	3311	OIL	35-113-08343	2303	PA_PROD
35-113-08302	3312	PA_PROD	35-113-08344	2304	PA_PROD
35-113-08303	3313	PA_PROD	35-113-08345	2305	PA_PROD
35-113-08304	3314	P&A_INJ	35-113-08346	2306	PA_PROD
35-113-08305	3315	OIL	35-113-08347	2307W	WAG
35-113-08306	3316	OIL	35-113-08348	2308	PA_PROD
35-113-08307	321	PA_PROD	35-113-08349	2309	OIL
35-113-08308	3202	OIL	35-113-08350	2310	OIL
35-113-08310	3204	OIL	35-113-08351	2311	PA_PROD
35-113-08311	3205	PA_PROD	35-113-08352	2312	OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08353	2313	PA_PROD	35-113-08412	2201	OIL
35-113-08354	2314	P&A_INJ	35-113-08413	2202W	W_INJ
35-113-08355	2315	PA_PROD	35-113-08414	2203	OIL
35-113-08356	2316	PA_PROD	35-113-08415	2204W	P&A_INJ
35-113-08357	2321W	WAG	35-113-08416	2205	OIL
35-113-08358	2323W	P&A_INJ	35-113-08417	2206	PA_PROD
35-113-08359	2325W	WAG	35-113-08418	2207	OIL
35-113-08360	2326W	P&A_INJ	35-113-08419	2208	PA_PROD
35-113-08361	2327W	P&A_INJ	35-113-08420	2209	OIL
35-113-08362	2328W	WAG	35-113-08421	2210	PA_PROD
35-113-08363	2421W	WAG	35-113-08422	2211	P&A_INJ
35-113-08364	2422W	P&A_INJ	35-113-08423	2212	PA_PROD
35-113-08365	2423W	P&A_INJ	35-113-08424	2213	PA_PROD
35-113-08366	2424W	WAG	35-113-08425	2214	PA_PROD
35-113-08367	2425W	P&A_INJ	35-113-08426	2215	OIL
35-113-08368	2426W	P&A_INJ	35-113-08427	2216	PA_PROD
35-113-08369	2427W	P&A_INJ	35-113-08428	3801	PA_PROD
35-113-08370	2428W	P&A_INJ	35-113-08429	3802	PA_PROD
35-113-08371	3121W	P&A_INJ	35-113-08429	3802A	SI_OIL
35-113-08372	3123W	P&A_INJ	35-113-08430	3803	P&A_INJ
35-113-08373	3125W	WAG	35-113-08431	3804	PA_PROD
35-113-08374	3127W	P&A_INJ	35-113-08431	3804A	SI_OIL
35-113-08375	3221W	P&A_INJ	35-113-08432	3805	SI_OIL
35-113-08376	3223W	WAG	35-113-08433	3806	PA_PROD
35-113-08377	3225W	WAG	35-113-08434	3807	PA_PROD
35-113-08378	3227W	WAG	35-113-08435	3808W	P&A_INJ
35-113-08394	2223W	P&A_INJ	35-113-08436	3809	PA_PROD
35-113-08395	2227W	P&A_INJ	35-113-08437	3810	PA_PROD
35-113-08396	3008A	PA_PROD	35-113-08438	3811	PA_PROD
35-113-08397	3015A	OIL	35-113-08439	3812W	P&A_INJ
35-113-08398	3022W	P&A_INJ	35-113-08440	3813W	P&A_INJ
35-113-08399	3023W	W_INJ	35-113-08441	3814	PA_PROD
35-113-08400	3025W	W_INJ	35-113-08442	3815W	SI_WINJ
35-113-08401	3027W	W_INJ	35-113-08443	3816	PA_PROD
35-113-08402	3001	SI_OIL	35-113-08444	4701	P&A_INJ
35-113-08403	3002	SI_OIL	35-113-08445	4702	P&A_INJ
35-113-08404	3003	PA_PROD	35-113-08445	4702AW	SI_WINJ
35-113-08405	3004	PA_PROD	35-113-08446	4703	PA_PROD
35-113-08406	3006	PA_PROD	35-113-08447	4704	P&A_INJ
35-113-08407	3011	OIL	35-113-08448	4706	PA_PROD
35-113-08408	3012	OIL	35-113-08449	4707	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08450	4708	P&A_INJ	35-113-08491	4016	OIL
35-113-08451	4709	PA_PROD	35-113-08492	4101	PA_PROD
35-113-08452	4710	P&A_INJ	35-113-08492	4101A	SI_OIL
35-113-08453	4711	PA_PROD	35-113-08493	4102	SI_OIL
35-113-08454	4712	PA_PROD	35-113-08494	4103	PA_PROD
35-113-08455	3827W	P&A_INJ	35-113-08494	4103A	SI_OIL
35-113-08456	4728W	P&A_INJ	35-113-08495	4104	SI_OIL
35-113-08457	3921W	P&A_INJ	35-113-08496	4105	PA_PROD
35-113-08458	3923W	P&A_INJ	35-113-08497	4106	PA_PROD
35-113-08459	3925W	WAG	35-113-08498	4107	PA_PROD
35-113-08460	3927W	P&A_INJ	35-113-08499	4108	PA_PROD
35-113-08461	4021W	P&A_INJ	35-113-08500	4109	PA_PROD
35-113-08462	4023W	P&A_INJ	35-113-08501	4110	PA_PROD
35-113-08463	4025W	P&A_INJ	35-113-08502	4111	OIL
35-113-08464	4027W	P&A_INJ	35-113-08503	4112	OIL
35-113-08465	4825W	P&A_INJ	35-113-08504	4113	SI_OIL
35-113-08466	4827W	P&A_INJ	35-113-08505	4114	OIL
35-113-08467	4922W	P&A_INJ	35-113-08505	4114W	P&A_INJ
35-113-08468	4923W	P&A_INJ	35-113-08506	4115	PA_PROD
35-113-08469	4925W	P&A_INJ	35-113-08507	4116	WAG
35-113-08470	4927W	SI_WINJ	35-113-08508	5101	SI_OIL
35-113-08471	3901	SI_OIL	35-113-08509	5102	PA_PROD
35-113-08473	3908	PA_PROD	35-113-08510	5103	SI_OIL
35-113-08474	3917	P&A_INJ	35-113-08511	5104	SI_OIL
35-113-08475	4001	PA_PROD	35-113-08512	5105	PA_PROD
35-113-08475	4001A	SI_OIL	35-113-08513	5106	PA_PROD
35-113-08476	4002	PA_PROD	35-113-08514	5107	P&A_INJ
35-113-08477	4003W	W_INJ	35-113-08515	5130W	W_INJ
35-113-08478	4004	SI_OIL	35-113-08516	5109	PA_PROD
35-113-08479	4005	PA_PROD	35-113-08517	5110	PA_PROD
35-113-08480	4006W	W_INJ	35-113-08518	5111	OIL
35-113-08481	4007	PA_PROD	35-113-08519	5112	SI_OIL
35-113-08482	4008	PA_PROD	35-113-08520	5113	PA_PROD
35-113-08483	4009	PA_PROD	35-113-08521	5114	PA_PROD
35-113-08484	4010	PA_PROD	35-113-08522	5115	SI_OIL
35-113-08485	4011	PA_PROD	35-113-08523	4116	PA_PROD
35-113-08486	4012	PA_PROD	35-113-08524	4141W	P&A_INJ
35-113-08487	4013	OIL	35-113-08525	4121AW	SI_WINJ
35-113-08488	4014A	SI_OIL	35-113-08525	4121W	P&A_INJ
35-113-08489	4014	PA_PROD	35-113-08526	4128AW	SI_WINJ
35-113-08490	4015W	SI_WINJ	35-113-08526	4128W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08527	4125W	WAG	35-113-08568	6410	SI_WINJ
35-113-08528	4127W	P&A_INJ	35-113-08569	6411	OIL
35-113-08529	4131W	P&A_INJ	35-113-08570	6412	OIL
35-113-08530	4232D	SWD	35-113-08571	6501W	P&A_INJ
35-113-08531	4223W	P&A_INJ	35-113-08572	6502W	P&A_INJ
35-113-08532	4225W	W_INJ	35-113-08573	6505W	P&A_INJ
35-113-08533	4227W	P&A_INJ	35-113-08574	6407	PA_PROD
35-113-08534	5005A	TA_OIL	35-113-08575	6506W	W_INJ
35-113-08535	5024W	P&A_INJ	35-113-08577	6514	SI_OIL
35-113-08536	5025W	P&A_INJ	35-113-08589	7305	P&A_INJ
35-113-08537	5027W	P&A_INJ	35-113-08590	7306W	P&A_INJ
35-113-08538	5121W	P&A_INJ	35-113-08591	7307	SI_OIL
35-113-08539	5123W	P&A_INJ	35-113-08592	7307W	P&A_INJ
35-113-08540	5122W	P&A_INJ	35-113-08593	7308	SI_OIL
35-113-08541	5125W	SI_WINJ	35-113-08594	7308W	SI_WINJ
35-113-08542	5127W	P&A_INJ	35-113-08595	7309	PA_PROD
35-113-08543	5821W	P&A_INJ	35-113-08596	7310W	SI_WINJ
35-113-08544	5917	SI_OIL	35-113-08597	7311	SI_OIL
35-113-08545	5921W	P&A_INJ	35-113-08598	7312W	SI_WINJ
35-113-08546	5923W	P&A_INJ	35-113-08599	7313	SI_OIL
35-113-08547	5925W	P&A_INJ	35-113-08600	7314	PA_PROD
35-113-08548	5926W	W_INJ	35-113-08601	7315	SI_OIL
35-113-08549	5927W	SI_WINJ	35-113-08602	7413	SI_OIL
35-113-08550	6611	SI_OIL	35-113-08603	7414	SI_OIL
35-113-08551	6601W	P&A_INJ	35-113-08604	8202	SI_OIL
35-113-08552	6602W	W_INJ	35-113-08605	8203	PA_PROD
35-113-08553	6604W	P&A_INJ	35-113-08606	8204W	SI_WINJ
35-113-08554	6703W	SI_WINJ	35-113-08607	8205	PA_PROD
35-113-08555	6705W	W_INJ	35-113-08608	8206W	SI_WINJ
35-113-08556	6707W	P&A_INJ	35-113-08609	8207	SI_OIL
35-113-08557	6709A	PA_PROD	35-113-08610	8208	PA_PROD
35-113-08558	5612	SI_OIL	35-113-08611	8208W	P&A_INJ
35-113-08559	5613	SI_OIL	35-113-08612	8301A	PA_PROD
35-113-08560	5614	PA_PROD	35-113-08613	8305W	SI_WINJ
35-113-08561	5624W	P&A_INJ	35-113-08614	8306W	SI_WINJ
35-113-08562	5628W	P&A_INJ	35-113-08615	8307A	SI_OIL
35-113-08563	5721W	P&A_INJ	35-113-08616	8307W	SI_WINJ
35-113-08564	5723W	P&A_INJ	35-113-08617	8308W	P&A_INJ
35-113-08565	6401W	W_INJ	35-113-08618	8301	PA_PROD
35-113-08566	6403W	SI_WINJ	35-113-08619	8302	PA_PROD
35-113-08567	6409	SI_OIL	35-113-08620	8303	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08621	8304	PA_PROD	35-113-08664	7608	PA_PROD
35-113-08622	8305	PA_PROD	35-113-08665	7609	PA_PROD
35-113-08623	8306	PA_PROD	35-113-08666	7610	PA_PROD
35-113-08624	8307	PA_PROD	35-113-08667	7611	PA_PROD
35-113-08625	8308	PA_PROD	35-113-08668	7612	PA_PROD
35-113-08626	8310	PA_PROD	35-113-08669	7613	PA_PROD
35-113-08627	8311	PA_PROD	35-113-08670	7614	SI_OIL
35-113-08628	8410	PA_PROD	35-113-08671	7615	PA_PROD
35-113-08629	8404	SI_OIL	35-113-08674	8502	PA_PROD
35-113-08630	8405	PA_PROD	35-113-08675	8503W	P&A_INJ
35-113-08632	8403	PA_PROD	35-113-08676	8504	SI_OIL
35-113-08633	8406	PA_PROD	35-113-08677	8505	PA_PROD
35-113-08634	8407	P&A_INJ	35-113-08678	8506	SI_OIL
35-113-08635	848	PA_PROD	35-113-08679	8507	PA_PROD
35-113-08635	8408	SI_OIL	35-113-08680	8508W	P&A_INJ
35-113-08637	8411	SI_OIL	35-113-08681	8509	PA_PROD
35-113-08638	7510	SI_OIL	35-113-08682	8510	PA_PROD
35-113-08639	7511	OIL	35-113-08683	8511	PA_PROD
35-113-08640	7512	SI_OIL	35-113-08684	8512	PA_PROD
35-113-08641	7602	PA_PROD	35-113-08685	8513	DRY
35-113-08641	7602A	OIL	35-113-08686	8514	PA_PROD
35-113-08643	7613A	OIL	35-113-08687	7501	PA_PROD
35-113-08644	7617	SI_OIL	35-113-08688	7502	PA_PROD
35-113-08645	7618	PA_PROD	35-113-08689	7503	DRY
35-113-08646	8301W	P&A_INJ	35-113-08690	7507	PA_PROD
35-113-08647	8405W	P&A_INJ	35-113-08691	7509	PA_PROD
35-113-08648	8406A	SI_OIL	35-113-08693	7508	PA_PROD
35-113-08649	8406W	W_INJ	35-113-08694	14201	PA_PROD
35-113-08650	8407W	W_INJ	35-113-08695	14202	DRY
35-113-08651	8417A	OIL	35-113-08696	14203	DRY
35-113-08652	8505W	P&A_INJ	35-113-08697	1309	SI_OIL
35-113-08653	8506W	W_INJ	35-113-08698	1301	PA_PROD
35-113-08654	8509W	P&A_INJ	35-113-08699	1302	PA_PROD
35-113-08655	8515	SI_OIL	35-113-08700	1303	PA_PROD
35-113-08656	8516	OIL	35-113-08701	1304	PA_PROD
35-113-08657	7601	PA_PROD	35-113-08703	1306	P&A_INJ
35-113-08659	7603	PA_PROD	35-113-08704	1307	PA_PROD
35-113-08660	7504	PA_PROD	35-113-08705	1310	PA_PROD
35-113-08661	7605	SI_OIL	35-113-08706	1313	P&A_INJ
35-113-08662	7606	PA_PROD	35-113-08707	2001	PA_PROD
35-113-08663	7607	PA_PROD	35-113-08708	2003	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08709	2004	SI_OIL	35-113-08763	3707	SI_OIL
35-113-08710	2005	PA_PROD	35-113-08764	3708	SI_OIL
35-113-08711	1906W	P&A_INJ	35-113-08765	3709	PA_PROD
35-113-08712	2007	PA_PROD	35-113-08766	3710	SI_OIL
35-113-08713	2008	PA_PROD	35-113-08767	3721W	SI_WINJ
35-113-08714	2009	SI_OIL	35-113-08768	3725W	SI_WINJ
35-113-08715	2010	PA_PROD	35-113-08769	3726W	P&A_INJ
35-113-08716	2011	SI_OIL	35-113-08770	3703	PA_PROD
35-113-08717	2013	PA_PROD	35-113-08771	3704	P&A_INJ
35-113-08718	2014	SI_OIL	35-113-08772	3705W	SI_WINJ
35-113-08719	1907	PA_PROD	35-113-08773	3706	PA_PROD
35-113-08720	1908	PA_PROD	35-113-08777	3532	UNKNW
35-113-08721	1911	SI_OIL	35-113-08778	2721W	P&A_INJ
35-113-08722	1912	SI_OIL	35-113-08779	2722W	P&A_INJ
35-113-08723	1915	PA_PROD	35-113-08780	2723W	P&A_INJ
35-113-08724	1916	PA_PROD	35-113-08781	2724W	SI_WINJ
35-113-08725	1321W	P&A_INJ	35-113-08782	2725W	P&A_INJ
35-113-08726	1322W	P&A_INJ	35-113-08783	2726W	SI_WINJ
35-113-08727	1323W	P&A_INJ	35-113-08784	2727W	SI_WINJ
35-113-08728	1324W	P&A_INJ	35-113-08785	2728W	P&A_INJ
35-113-08729	1325W	P&A_INJ	35-113-08786	2801A	PA_PROD
35-113-08730	1921W	P&A_INJ	35-113-08787	2821W	P&A_INJ
35-113-08731	1922W	SI_WINJ	35-113-08788	2822W	P&A_INJ
35-113-08732	1923W	P&A_INJ	35-113-08789	2823W	P&A_INJ
35-113-08733	1924W	P&A_INJ	35-113-08790	2824W	P&A_INJ
35-113-08734	1925	P&A_INJ	35-113-08791	2825W	P&A_INJ
35-113-08735	1926W	SI_WINJ	35-113-08792	2826W	P&A_INJ
35-113-08736	1927W	P&A_INJ	35-113-08793	2827W	P&A_INJ
35-113-08737	1928W	P&A_INJ	35-113-08794	2828W	P&A_INJ
35-113-08738	2002	SI_OIL	35-113-08795	3521W	SI_WINJ
35-113-08739	20W21	P&A_INJ	35-113-08796	3523W	P&A_INJ
35-113-08740	20W22	P&A_INJ	35-113-08797	3525W	P&A_INJ
35-113-08741	20W24	P&A_INJ	35-113-08798	3527W	SI_WINJ
35-113-08742	20W25	P&A_INJ	35-113-08799	3616	SI_OIL
35-113-08743	2101	PA_PROD	35-113-08800	3621W	P&A_INJ
35-113-08744	2102	DRY	35-113-08801	3622W	P&A_INJ
35-113-08745	2103	PA_PROD	35-113-08802	3624W	SI_WINJ
35-113-08759	2921W	P&A_INJ	35-113-08803	3625W	SI_WINJ
35-113-08760	2922W	P&A_INJ	35-113-08804	3627W	P&A_INJ
35-113-08761	2923W	P&A_INJ	35-113-08805	3628W	P&A_INJ
35-113-08762	2925W	P&A_INJ	35-113-08806	2701	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08807	2702	SI_OIL	35-113-08850	4301	SI_OIL
35-113-08808	2703A	PA_PROD	35-113-08851	4302	OIL
35-113-08809	2704	SI_OIL	35-113-08852	4303	SI_OIL
35-113-08810	2705	P&A_INJ	35-113-08853	4304	OIL
35-113-08811	2706	PA_PROD	35-113-08854	4305	PA_PROD
35-113-08812	2708	PA_PROD	35-113-08856	4307	PA_PROD
35-113-08813	2709	TA_OIL	35-113-08857	4308	PA_PROD
35-113-08814	2710	PA_PROD	35-113-08858	4309	PA_PROD
35-113-08815	2711	PA_PROD	35-113-08859	4310	PA_PROD
35-113-08816	2712	PA_PROD	35-113-08860	4311	SI_OIL
35-113-08817	3501	PA_PROD	35-113-08861	4312	DRY
35-113-08818	3502	PA_PROD	35-113-08862	2713A	SI_OIL
35-113-08819	3503	SI_OIL	35-113-08863	4313	OIL
35-113-08820	3504	SI_OIL	35-113-08864	4315	PA_PROD
35-113-08821	3505	PA_PROD	35-113-08865	4316	PA_PROD
35-113-08822	3506	PA_PROD	35-113-08866	4314	SI_OIL
35-113-08823	3507	PA_PROD	35-113-08866	4314A	OIL
35-113-08824	3508	PA_PROD	35-113-08867	4322W	W_INJ
35-113-08825	3509	PA_PROD	35-113-08868	4324W	W_INJ
35-113-08826	3510	PA_PROD	35-113-08869	4325W	W_INJ
35-113-08827	3511	SI_OIL	35-113-08870	4327W	SI_WINJ
35-113-08828	3512	PA_PROD	35-113-08871	4422W	P&A_INJ
35-113-08829	3513W	P&A_INJ	35-113-08872	4424W	SI_WINJ
35-113-08830	3514	PA_PROD	35-113-08873	4425W	SI_WINJ
35-113-08831	3515	PA_PROD	35-113-08874	4426W	W_INJ
35-113-08832	3516	PA_PROD	35-113-08875	4428W	P&A_INJ
35-113-08833	5301A	SI_OIL	35-113-08876	5221W	P&A_INJ
35-113-08834	5301	PA_PROD	35-113-08877	5222W	P&A_INJ
35-113-08835	5302	OIL	35-113-08878	5223W	W_INJ
35-113-08836	5303	SI_OIL	35-113-08879	5224W	P&A_INJ
35-113-08837	5304	PA_PROD	35-113-08880	5225W	P&A_INJ
35-113-08838	5305	SI_OIL	35-113-08881	5227W	P&A_INJ
35-113-08839	5306W	P&A_INJ	35-113-08882	5304A	OIL
35-113-08840	5307	PA_PROD	35-113-08883	5321W	P&A_INJ
35-113-08841	5308W	P&A_INJ	35-113-08884	5322W	SI_WINJ
35-113-08843	5310	PA_PROD	35-113-08885	5323W	P&A_INJ
35-113-08845	5312	SI_OIL	35-113-08886	5324W	P&A_INJ
35-113-08846	5313	PA_PROD	35-113-08887	5325W	W_INJ
35-113-08847	5314	PA_PROD	35-113-08888	5327W	P&A_INJ
35-113-08848	5315	OIL	35-113-08889	4401	SI_OIL
35-113-08849	5316	PA_PROD	35-113-08890	4402	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-08891	4403	PA_PROD	35-113-08939	5410	PA_PROD
35-113-08892	4404	PA_PROD	35-113-08940	5411	PA_PROD
35-113-08893	4405	PA_PROD	35-113-08941	5412	PA_PROD
35-113-08894	4406	PA_PROD	35-113-08942	5413	PA_PROD
35-113-08895	4407W	P&A_INJ	35-113-08943	5414	PA_PROD
35-113-08896	4408	PA_PROD	35-113-08944	5415	PA_PROD
35-113-08897	4409	SI_OIL	35-113-08945	5416	PA_PROD
35-113-08898	4410	SI_OIL	35-113-08970	7201	PA_PROD
35-113-08899	4411	PA_PROD	35-113-08971	7202	PA_PROD
35-113-08900	4411A	PA_PROD	35-113-08972	7203	PA_PROD
35-113-08901	4412	SI_OIL	35-113-08973	7204	PA_PROD
35-113-08902	4413	SI_OIL	35-113-08974	7205	PA_PROD
35-113-08903	4414	SI_OIL	35-113-08975	6	PA_PROD
35-113-08904	4414A	PA_PROD	35-113-08976	7208	PA_PROD
35-113-08905	4415	PA_PROD	35-113-08977	7209	PA_PROD
35-113-08913	4502A	SI_OIL	35-113-08978	7210	PA_PROD
35-113-08914	4508	PA_PROD	35-113-08979	1	PA_PROD
35-113-08915	4509	SI_OIL	35-113-08980	2	SI_OIL
35-113-08916	4521W	SI_WINJ	35-113-09001	7	SI_OIL
35-113-08917	4522W	P&A_INJ	35-113-09002	7201W	P&A_INJ
35-113-08918	4524W	SI_WINJ	35-113-09003	7205W	P&A_INJ
35-113-08919	4526W	SI_WINJ	35-113-09004	7209A	PA_PROD
35-113-08920	5404A	PA_PROD	35-113-09005	6201	PA_PROD
35-113-08921	5405A	PA_PROD	35-113-09006	6202	PA_PROD
35-113-08922	5410A	PA_PROD	35-113-09007	6203	PA_PROD
35-113-08923	5421W	P&A_INJ	35-113-09008	6204	PA_PROD
35-113-08924	5422W	P&A_INJ	35-113-09009	6205	PA_PROD
35-113-08925	5423W	P&A_INJ	35-113-09010	6206	PA_PROD
35-113-08926	5424W	P&A_INJ	35-113-09011	6207	PA_PROD
35-113-08927	5425W	P&A_INJ	35-113-09012	6208	PA_PROD
35-113-08928	5427W	P&A_INJ	35-113-09013	6209	PA_PROD
35-113-08929	5521W	P&A_INJ	35-113-09014	6210	PA_PROD
35-113-08930	5525W	P&A_INJ	35-113-09016	6212	PA_PROD
35-113-08931	5401	PA_PROD	35-113-09017	6213	PA_PROD
35-113-08932	5402	PA_PROD	35-113-09018	6214	PA_PROD
35-113-08933	5403	PA_PROD	35-113-09019	6215	PA_PROD
35-113-08934	5404	PA_PROD	35-113-09020	6216	PA_PROD
35-113-08935	5405	PA_PROD	35-113-09021	6221W	P&A_INJ
35-113-08936	5406	PA_PROD	35-113-09022	6222W	P&A_INJ
35-113-08937	5407	PA_PROD	35-113-09023	6223W	P&A_INJ
35-113-08938	5409	P&A_INJ	35-113-09024	6224W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09025	6225W	P&A_INJ	35-113-09066	7003	PA_PROD
35-113-09026	6226W	P&A_INJ	35-113-09067	7004	PA_PROD
35-113-09027	6227W	P&A_INJ	35-113-09068	7005	PA_PROD
35-113-09028	6228W	P&A_INJ	35-113-09069	7006	PA_PROD
35-113-09029	6308	PA_PROD	35-113-09070	7007	PA_PROD
35-113-09030	6321W	P&A_INJ	35-113-09071	7008	PA_PROD
35-113-09031	6322W	P&A_INJ	35-113-09072	7009	PA_PROD
35-113-09032	6325W	P&A_INJ	35-113-09073	7010	PA_PROD
35-113-09033	7001A	SI_OIL	35-113-09074	7011	PA_PROD
35-113-09034	7001W	P&A_INJ	35-113-09075	7012	PA_PROD
35-113-09035	7002W	P&A_INJ	35-113-09076	7013	PA_PROD
35-113-09036	7003W	P&A_INJ	35-113-09077	7014	P&A_INJ
35-113-09037	7004W	P&A_INJ	35-113-09078	7015	PA_PROD
35-113-09038	7005W	P&A_INJ	35-113-09079	7016	PA_PROD
35-113-09039	7006W	P&A_INJ	35-113-09080	6301	PA_PROD
35-113-09040	7007W	SI_WINJ	35-113-09081	6021W	P&A_INJ
35-113-09041	7008W	P&A_INJ	35-113-09082	6022W	P&A_INJ
35-113-09042	7013A	SI_OIL	35-113-09083	6024W	SI_WINJ
35-113-09043	7101W	P&A_INJ	35-113-09084	6025W	SI_WINJ
35-113-09044	7102W	P&A_INJ	35-113-09085	6026W	SI_WINJ
35-113-09045	7103W	P&A_INJ	35-113-09086	6028W	W_INJ
35-113-09046	7104W	P&A_INJ	35-113-09087	6121W	W_INJ
35-113-09047	7105W	P&A_INJ	35-113-09088	6122W	SI_WINJ
35-113-09048	7106W	P&A_INJ	35-113-09089	6123W	P&A_INJ
35-113-09049	7107W	P&A_INJ	35-113-09090	6124W	SI_WINJ
35-113-09050	708	PA_PROD	35-113-09091	6125W	P&A_INJ
35-113-09051	7101	PA_PROD	35-113-09092	4306	PA_PROD
35-113-09052	7102	PA_PROD	35-113-09093	6126W	W_INJ
35-113-09053	7103	PA_PROD	35-113-09094	6127W	SI_WINJ
35-113-09054	7104	PA_PROD	35-113-09095	6128W	P&A_INJ
35-113-09055	7105	PA_PROD	35-113-09096	6801W	SI_WINJ
35-113-09056	7106	SI_OIL	35-113-09097	6802W	SI_WINJ
35-113-09057	7107	PA_PROD	35-113-09098	6803W	SI_WINJ
35-113-09058	7108	PA_PROD	35-113-09099	6804W	P&A_INJ
35-113-09059	7109	PA_PROD	35-113-09100	6805W	P&A_INJ
35-113-09060	7110	P&A_INJ	35-113-09101	6806W	P&A_INJ
35-113-09061	7111	SI_OIL	35-113-09102	6807W	P&A_INJ
35-113-09062	7112	PA_PROD	35-113-09103	6808W	SI_WINJ
35-113-09063	7113	PA_PROD	35-113-09104	6901W	P&A_INJ
35-113-09064	7001	PA_PROD	35-113-09105	6902W	SI_WINJ
35-113-09065	7002	PA_PROD	35-113-09106	6903W	SI_WINJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09107	69W4	SI_WINJ	35-113-09149	6807	PA_PROD
35-113-09108	6905W	SI_WINJ	35-113-09150	6813	PA_PROD
35-113-09109	6906W	P&A_INJ	35-113-09151	6805	PA_PROD
35-113-09110	6907W	P&A_INJ	35-113-09152	6808	PA_PROD
35-113-09111	6908W	P&A_INJ	35-113-09153	6809	PA_PROD
35-113-09112	6101	PA_PROD	35-113-09154	6810	SI_OIL
35-113-09113	6102	OIL	35-113-09155	6811W	P&A_INJ
35-113-09114	6103	PA_PROD	35-113-09156	6812	PA_PROD
35-113-09115	6104	SI_OIL	35-113-09157	6814	PA_PROD
35-113-09116	6105	PA_PROD	35-113-09158	6815	PA_PROD
35-113-09117	6106	PA_PROD	35-113-09159	6816	PA_PROD
35-113-09118	6107	PA_PROD	35-113-09160	6817	PA_PROD
35-113-09119	6108	PA_PROD	35-113-09161	8601	PA_PROD
35-113-09120	6109	PA_PROD	35-113-09162	8602	PA_PROD
35-113-09121	6110	PA_PROD	35-113-09163	8603	PA_PROD
35-113-09122	6111	SI_OIL	35-113-09164	8604	PA_PROD
35-113-09124	6113	PA_PROD	35-113-09165	8606	OIL
35-113-09125	6114	PA_PROD	35-113-09166	8607	PA_PROD
35-113-09126	6115	PA_PROD	35-113-09167	8608	PA_PROD
35-113-09127	6116	PA_PROD	35-113-09168	8609	SI_OIL
35-113-09128	6901	PA_PROD	35-113-09169	8610	PA_PROD
35-113-09129	6902	SI_OIL	35-113-09170	8611	PA_PROD
35-113-09130	6903	SI_OIL	35-113-09171	8612	PA_PROD
35-113-09131	6904	PA_PROD	35-113-09172	8613	PA_PROD
35-113-09132	6905	PA_PROD	35-113-09173	8614	PA_PROD
35-113-09133	6906	PA_PROD	35-113-09174	8615	P&A_INJ
35-113-09134	6907	SI_OIL	35-113-09175	8616	P&A_INJ
35-113-09135	6908	PA_PROD	35-113-09176	8701	PA_PROD
35-113-09136	6909	PA_PROD	35-113-09177	8702	PA_PROD
35-113-09137	6910	PA_PROD	35-113-09179	8704	PA_PROD
35-113-09138	6911	PA_PROD	35-113-09180	8705	PA_PROD
35-113-09139	6912	PA_PROD	35-113-09181	8706	PA_PROD
35-113-09140	6913	PA_PROD	35-113-09182	8707	PA_PROD
35-113-09141	6914	SI_OIL	35-113-09183	8708	PA_PROD
35-113-09142	6915	SI_OIL	35-113-09184	8709	PA_PROD
35-113-09143	6916	PA_PROD	35-113-09185	8710	SI_OIL
35-113-09144	6801	PA_PROD	35-113-09186	8711	P&A_INJ
35-113-09145	6802	SI_OIL	35-113-09187	8712	PA_PROD
35-113-09146	6803	PA_PROD	35-113-09188	8613	PA_PROD
35-113-09147	6804	PA_PROD	35-113-09188	8713	OIL
35-113-09148	6806	PA_PROD	35-113-09189	8714	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09190	8715	PA_PROD	35-113-09232	7710	PA_PROD
35-113-09191	8716	P&A_INJ	35-113-09233	7706	PA_PROD
35-113-09192	7801	PA_PROD	35-113-09234	7713	PA_PROD
35-113-09193	7802	PA_PROD	35-113-09235	867	SI_OIL
35-113-09194	7803A	SI_OIL	35-113-09236	8801	SI_OIL
35-113-09195	7804	OIL	35-113-09237	8802	PA_PROD
35-113-09196	7805	PA_PROD	35-113-09238	8803	PA_PROD
35-113-09197	7806	PA_PROD	35-113-09239	8804	PA_PROD
35-113-09198	7807	PA_PROD	35-113-09240	8805	PA_PROD
35-113-09199	7808	SI_OIL	35-113-09241	8806	SI_OIL
35-113-09200	7809	SI_OIL	35-113-09242	8807	PA_PROD
35-113-09201	7810	OIL	35-113-09243	8808	SI_OIL
35-113-09202	7811	SI_OIL	35-113-09244	8809	PA_PROD
35-113-09203	7812	SI_OIL	35-113-09245	8810	P&A_INJ
35-113-09204	7813	OIL	35-113-09246	8811	PA_PROD
35-113-09205	7814	PA_PROD	35-113-09247	8812	PA_PROD
35-113-09206	7815	P&A_INJ	35-113-09248	8813	OIL
35-113-09207	7816	SI_OIL	35-113-09249	8814	PA_PROD
35-113-09208	771A	PA_PROD	35-113-09250	8815	PA_PROD
35-113-09209	7702A	SI_OIL	35-113-09251	8816	PA_PROD
35-113-09210	7704A	SI_OIL	35-113-09252	7901	PA_PROD
35-113-09211	7708	SI_OIL	35-113-09253	7902	PA_PROD
35-113-09212	7717	SI_OIL	35-113-09254	7903	PA_PROD
35-113-09213	8616A	SI_OIL	35-113-09255	7904	PA_PROD
35-113-09214	8617	OIL	35-113-09256	7905A	PA_PROD
35-113-09215	8605W	W_INJ	35-113-09257	7906	PA_PROD
35-113-09216	8606W	SI_WINJ	35-113-09258	8807	SI_OIL
35-113-09217	8607W	SI_WINJ	35-113-09259	7908	SI_OIL
35-113-09218	8608W	P&A_INJ	35-113-09260	7909	SI_OIL
35-113-09219	7701	PA_PROD	35-113-09261	7910	PA_PROD
35-113-09220	7702	PA_PROD	35-113-09262	7911	SI_OIL
35-113-09221	7703	PA_PROD	35-113-09263	7912	SI_OIL
35-113-09222	7705	PA_PROD	35-113-09264	7913	SI_OIL
35-113-09223	7707	PA_PROD	35-113-09265	7914	PA_PROD
35-113-09225	7709	PA_PROD	35-113-09266	7915	P&A_INJ
35-113-09226	7711W	W_INJ	35-113-09267	7916	SI_OIL
35-113-09227	7712	SI_OIL	35-113-09268	8007A	SI_OIL
35-113-09228	7714	PA_PROD	35-113-09269	8807W	SI_WINJ
35-113-09229	7715	PA_PROD	35-113-09270	8809A	PA_PROD
35-113-09230	7716	PA_PROD	35-113-09271	8903A	SI_OIL
35-113-09231	7704	PA_PROD	35-113-09272	8905A	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-09273	8905W	SI_WINJ	35-113-09318	9003	PA_PROD
35-113-09274	8906W	W_INJ	35-113-09319	9004	PA_PROD
35-113-09275	8907W	SI_WINJ	35-113-09320	9005	PA_PROD
35-113-09276	8901	PA_PROD	35-113-09321	9006	P&A_INJ
35-113-09277	8902	PA_PROD	35-113-09322	9007	PA_PROD
35-113-09278	8903	PA_PROD	35-113-09323	9008	SI_OIL
35-113-09279	8904	PA_PROD	35-113-09324	9009	SI_OIL
35-113-09280	8905	PA_PROD	35-113-09325	9010	PA_PROD
35-113-09281	8906	SI_OIL	35-113-09326	9011	PA_PROD
35-113-09282	8907	PA_PROD	35-113-09327	9012	OIL
35-113-09283	8908	PA_PROD	35-113-09328	9013	P&A_INJ
35-113-09284	8909	PA_PROD	35-113-09329	9014	SI_OIL
35-113-09285	8910	PA_PROD	35-113-09330	9015	SI_OIL
35-113-09286	8911	SI_OIL	35-113-09331	9016	PA_PROD
35-113-09287	8912	PA_PROD	35-113-09332	8101	PA_PROD
35-113-09288	8913	PA_PROD	35-113-09333	812	PA_PROD
35-113-09289	8914	PA_PROD	35-113-09334	8103	P&A_INJ
35-113-09290	8915	OIL	35-113-09335	8104	SI_OIL
35-113-09291	8916	PA_PROD	35-113-09336	8105	PA_PROD
35-113-09292	8003	SI_OIL	35-113-09337	8106	PA_PROD
35-113-09293	8004	PA_PROD	35-113-09338	8107	SI_OIL
35-113-09294	8005	PA_PROD	35-113-09339	8108	PA_PROD
35-113-09295	8006	SI_OIL	35-113-09340	8109	PA_PROD
35-113-09296	8007	PA_PROD	35-113-09341	8110	PA_PROD
35-113-09297	8008A	PA_PROD	35-113-09342	8111	PA_PROD
35-113-09298	8009	PA_PROD	35-113-09343	8112	P&A_INJ
35-113-09299	8010	PA_PROD	35-113-09971	610	OIL
35-113-09300	8011	SI_OIL	35-113-09972	602	OIL
35-113-09301	8012	OIL	35-113-09973	603	OIL
35-113-09302	8013	OIL	35-113-09974	605	PA_PROD
35-113-09303	8014	PA_PROD	35-113-09975	607	PA_PROD
35-113-09308	8113A	SI_OIL	35-113-09976	608	PA_PROD
35-113-09309	9006W	SI_WINJ	35-113-09977	609	OIL
35-113-09310	9007W	P&A_INJ	35-113-09979	604	OIL
35-113-09311	14301	PA_PROD	35-113-09980	606	P&A_INJ
35-113-09312	14302	PA_PROD	35-113-09983	961A	SI_OIL
35-113-09313	14303	PA_PROD	35-113-10648	7505	PA_PROD
35-113-09314	14304	PA_PROD	35-113-10649	752	PA_PROD
35-113-09315	14305	PA_PROD	35-113-10650	5508	DRY
35-113-09316	9001	PA_PROD	35-113-20605	3017	OIL
35-113-09317	9002	PA_PROD	35-113-21008	8717	OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-21339	1018	WAG	35-113-31831	9316	PA_PROD
35-113-21699	6613	OIL	35-113-31832	10101	PA_PROD
35-113-22373	10518D	SI_SWD	35-113-31833	10102	PA_PROD
35-113-22414	9732W	W_INJ	35-113-31834	10103	PA_PROD
35-113-22415	11401B	DRY	35-113-31835	10104	PA_PROD
35-113-22420	9723	SI_OIL	35-113-31836	10105	PA_PROD
35-113-22421	9724	SI_OIL	35-113-31837	10107	SI_OIL
35-113-22422	9729	SI_OIL	35-113-31838	10108	PA_PROD
35-113-22423	9735	SI_OIL	35-113-31839	10109	PA_PROD
35-113-22424	9736	SI_OIL	35-113-31840	10110	PA_PROD
35-113-22433	9730W	SI_WINJ	35-113-31841	10111	PA_PROD
35-113-22453	9731W	SI_WINJ	35-113-31842	10112	PA_PROD
35-113-22454	9733	OIL	35-113-31842	10112A	SI_OIL
35-113-22455	9734	SI_OIL	35-113-31844	10114	P&A_INJ
35-113-22495	9728	SI_OIL	35-113-31845	10115	PA_PROD
35-113-22507	9717	SI_OIL	35-113-31847	9202	SI_OIL
35-113-22508	9721	SI_OIL	35-113-31848	9203	PA_PROD
35-113-22509	9722	SI_OIL	35-113-31849	9204	PA_PROD
35-113-22539	7619	OIL	35-113-31850	9205	SI_OIL
35-113-25173	3429	OIL	35-113-31851	9206	SI_OIL
35-113-25310	5030	TA_OIL	35-113-31852	9207	PA_PROD
35-113-25336	5131	SI_OIL	35-113-31853	9208	PA_PROD
35-113-25337	5132	SI_OIL	35-113-31854	9209	PA_PROD
35-113-25359	5229	SI_OIL	35-113-31855	9210	SI_OIL
35-113-25360	5230	SI_OIL	35-113-31856	9211	P&A_INJ
35-113-25376	5228	OIL	35-113-31857	9212	SI_OIL
35-113-26892	43836	DRY	35-113-31858	9213	SI_OIL
35-113-26925	5233W	W_INJ	35-113-31859	9214	PA_PROD
35-113-31081	14201A	SI_OIL	35-113-31860	9215	OIL
35-113-31201	11902W	P&A_INJ	35-113-31861	9216	PA_PROD
35-113-31201	12016AW	SI_OIL	35-113-31862	10001	PA_PROD
35-113-31270	105	SI_OIL	35-113-31863	10002	SI_OIL
35-113-31821	9301	PA_PROD	35-113-31864	10003	PA_PROD
35-113-31823	9304	SI_OIL	35-113-31865	10004	PA_PROD
35-113-31823	9304A	PA_PROD	35-113-31866	10005	PA_PROD
35-113-31824	9305	PA_PROD	35-113-31867	10006	PA_PROD
35-113-31825	9306	SI_OIL	35-113-31868	10007	PA_PROD
35-113-31826	9307	PA_PROD	35-113-31870	10008	PA_PROD
35-113-31827	9309	PA_PROD	35-113-31871	10009	PA_PROD
35-113-31829	9313	P&A_INJ	35-113-31872	10010	PA_PROD
35-113-31830	9315	PA_PROD	35-113-31873	10015	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-31874	10016	PA_PROD	35-113-31967	10604	PA_PROD
35-113-31875	9201W	SI_WINJ	35-113-31968	9801W	P&A_INJ
35-113-31876	10101W	P&A_INJ	35-113-31969	9901W	P&A_INJ
35-113-31877	9202W	P&A_INJ	35-113-31970	9802W	P&A_INJ
35-113-31878	101WI	P&A_INJ	35-113-31971	9902W	P&A_INJ
35-113-31879	9203W	SI_WINJ	35-113-31972	9803W	P&A_INJ
35-113-31880	9303A	PA_PROD	35-113-31973	9804W	P&A_INJ
35-113-31881	10003W	SI_WINJ	35-113-31974	9805W	P&A_INJ
35-113-31882	10103W	P&A_INJ	35-113-31975	9806W	P&A_INJ
35-113-31883	9204W	SI_WINJ	35-113-31976	106W6	P&A_INJ
35-113-31884	10004W	SI_WINJ	35-113-31977	10706W	DRY
35-113-31885	10104W	P&A_INJ	35-113-31978	9807W	P&A_INJ
35-113-31886	9205W	SI_WINJ	35-113-31979	106W8	P&A_INJ
35-113-31887	10005W	P&A_INJ	35-113-31980	10401	PA_PROD
35-113-31888	10105W	P&A_INJ	35-113-31981	10402	PA_PROD
35-113-31889	9206W	P&A_INJ	35-113-31982	10403	PA_PROD
35-113-31890	10006W	P&A_INJ	35-113-31983	10404	SI_OIL
35-113-31891	9207W	P&A_INJ	35-113-31984	10405	PA_PROD
35-113-31892	10007W	SI_WINJ	35-113-31985	10406	PA_PROD
35-113-31893	10107W	TA_INJ	35-113-31986	10407	PA_PROD
35-113-31894	10008W	P&A_INJ	35-113-31987	10408	PA_PROD
35-113-31895	10108W	W_INJ	35-113-31988	10409	PA_PROD
35-113-31896	10116	PA_PROD	35-113-31989	10410	PA_PROD
35-113-31897	9104A	PA_PROD	35-113-31990	10411	SI_OIL
35-113-31898	9107W	P&A_INJ	35-113-31991	10412	PA_PROD
35-113-31899	9108W	P&A_INJ	35-113-31992	10413	SI_OIL
35-113-31901	9106	PA_PROD	35-113-31993	10414	SI_OIL
35-113-31902	9107	PA_PROD	35-113-31994	10415	P&A_INJ
35-113-31909	10806W	P&A_INJ	35-113-31995	10416	PA_PROD
35-113-31910	10807W	P&A_INJ	35-113-31996	9701	OIL
35-113-31911	10808W	SI_WINJ	35-113-31997	9702	PA_PROD
35-113-31955	9901	PA_PROD	35-113-31998	9703	PA_PROD
35-113-31956	9902	PA_PROD	35-113-31999	9704	PA_PROD
35-113-31957	9903	PA_PROD	35-113-32000	9705	PA_PROD
35-113-31958	9904	PA_PROD	35-113-32001	9706	SI_OIL
35-113-31959	9905	PA_PROD	35-113-32002	9707	PA_PROD
35-113-31962	9907	PA_PROD	35-113-32003	9708	SI_OIL
35-113-31963	9908	PA_PROD	35-113-32004	9709	SI_OIL
35-113-31964	9909	PA_PROD	35-113-32005	9710	PA_PROD
35-113-31965	9910	P&A_INJ	35-113-32006	9711	P&A_INJ
35-113-31966	10601	PA_PROD	35-113-32007	9712	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-32008	9713	PA_PROD	35-113-32047	10202	PA_PROD
35-113-32009	9714	PA_PROD	35-113-32048	10301	DRY
35-113-32010	975	PA_PROD	35-113-32048	10301A	PA_PROD
35-113-32011	9716	PA_PROD	35-113-32049	10302	SI_OIL
35-113-32012	10504W	UNKNW	35-113-32050	10304	PA_PROD
35-113-32013	9601W	SI_WINJ	35-113-32051	10305	PA_PROD
35-113-32014	9718W	SI_WINJ	35-113-32052	10306A	SI_OIL
35-113-32015	10401W	SI_WINJ	35-113-32053	10307	PA_PROD
35-113-32016	10501W	P&A_INJ	35-113-32054	10308	PA_PROD
35-113-32017	9602A	PA_PROD	35-113-32055	10309	OIL
35-113-32018	9702W	P&A_INJ	35-113-32056	10310	PA_PROD
35-113-32019	10402W	P&A_INJ	35-113-32057	10311	PA_PROD
35-113-32020	10502W	P&A_INJ	35-113-32058	10312	PA_PROD
35-113-32021	9603W	P&A_INJ	35-113-32059	10313	PA_PROD
35-113-32022	9703W	P&A_INJ	35-113-32060	10314	PA_PROD
35-113-32023	10403W	P&A_INJ	35-113-32061	10315W	P&A_INJ
35-113-32024	10503W	W_INJ	35-113-32062	10201W	P&A_INJ
35-113-32025	9604W	SI_WINJ	35-113-32063	10301W	P&A_INJ
35-113-32026	9704W	P&A_INJ	35-113-32064	10202W	P&A_INJ
35-113-32027	10404W	W_INJ	35-113-32065	10302W	P&A_INJ
35-113-32028	9605W	SI_WINJ	35-113-32066	9503W	SI_WINJ
35-113-32029	9705W	P&A_INJ	35-113-32067	10203W	SI_WINJ
35-113-32030	10405W	SI_WINJ	35-113-32068	10303W	P&A_INJ
35-113-32031	10505W	SI_WINJ	35-113-32069	9504W	W_INJ
35-113-32032	9606W	SI_WINJ	35-113-32070	10204W	P&A_INJ
35-113-32033	9706W	P&A_INJ	35-113-32071	10304W	SI_WINJ
35-113-32034	10406W	P&A_INJ	35-113-32072	9505W	W_INJ
35-113-32035	10506W	SI_WINJ	35-113-32073	10205W	W_INJ
35-113-32036	9607W	SI_WINJ	35-113-32074	10305W	P&A_INJ
35-113-32037	9707W	P&A_INJ	35-113-32075	9506A	PA_PROD
35-113-32038	10407W	SI_WINJ	35-113-32076	9506W	P&A_INJ
35-113-32039	10507W	W_INJ	35-113-32077	10206W	W_INJ
35-113-32040	9608A	SI_OIL	35-113-32078	10306	SI_OIL
35-113-32041	9608W	P&A_INJ	35-113-32079	10306W	P&A_INJ
35-113-32042	9708W	P&A_INJ	35-113-32080	9507W	W_INJ
35-113-32043	10408W	SI_WINJ	35-113-32081	10207W	SI_WINJ
35-113-32044	10408A	OIL	35-113-32082	10307W	P&A_INJ
35-113-32045	10508W	W_INJ	35-113-32083	9508W	P&A_INJ
35-113-32046	1021	PA_PROD	35-113-32084	10208W	P&A_INJ
35-113-32046	10201	PA_PROD	35-113-32085	10308W	P&A_INJ
35-113-32046	10201A	PA_PROD	35-113-32086	10314A	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-32087	10217D	SI_WINJ	35-113-32173	12816W	P&A_INJ
35-113-32088	11601	PA_PROD	35-113-32174	12701W	P&A_INJ
35-113-32089	11602	P&A_INJ	35-113-32175	12702W	P&A_INJ
35-113-32090	11001	PA_PROD	35-113-32176	12703W	P&A_INJ
35-113-32091	11002	PA_PROD	35-113-32177	12705W	P&A_INJ
35-113-32092	11003	PA_PROD	35-113-32178	12706W	P&A_INJ
35-113-32093	11004	PA_PROD	35-113-32179	12707W	P&A_INJ
35-113-32094	11005	PA_PROD	35-113-32180	12708W	P&A_INJ
35-113-32095	11006W	SI_WINJ	35-113-32181	12709W	P&A_INJ
35-113-32096	11007	OIL	35-113-32182	12717	SI_WTR_SRVC
35-113-32097	11008	SI_OIL	35-113-32184	14403A	SI_OIL
35-113-32098	10905W	P&A_INJ	35-113-32185	14410	SI_OIL
35-113-32099	11005W	P&A_INJ	35-113-32186	14411	SI_OIL
35-113-32100	10906W	P&A_INJ	35-113-32188	12601A	PA_PROD
35-113-32102	10907W	P&A_INJ	35-113-32192	14404A	SI_OIL
35-113-32103	10908	P&A_INJ	35-113-32193	14405A	PA_PROD
35-113-32104	10928W	SI_WINJ	35-113-32194	14407W	W_INJ
35-113-32105	10912	PA_PROD	35-113-32220	13212	PA_PROD
35-113-32106	11407AW	PA_PROD	35-113-32221	13214W	P&A_INJ
35-113-32107	11008W	P&A_INJ	35-113-32222	13215	SI_OIL
35-113-32108	11009W	SI_WINJ	35-113-32223	13216	PA_PROD
35-113-32109	11010	PA_PROD	35-113-32229	13411W	P&A_INJ
35-113-32110	11106W	P&A_INJ	35-113-32230	13412	SI_OIL
35-113-32111	11206	PA_PROD	35-113-32231	13413	PA_PROD
35-113-32112	11108W	P&A_INJ	35-113-32232	13301W	SI_WINJ
35-113-32113	11208W	P&A_INJ	35-113-32233	13302	P&A_INJ
35-113-32114	11110W	W_INJ	35-113-32234	13303W	P&A_INJ
35-113-32115	11112W	P&A_INJ	35-113-32235	13304	PA_PROD
35-113-32116	11205W	SI_WINJ	35-113-32236	13308W	P&A_INJ
35-113-32117	11708	OIL	35-113-32237	13309W	P&A_INJ
35-113-32118	11908W	P&A_INJ	35-113-32238	13310	PA_PROD
35-113-32119	11411W	P&A_INJ	35-113-32239	13311W	P&A_INJ
35-113-32120	11914	OIL	35-113-32240	13312	SI_OIL
35-113-32121	11307AW	P&A_INJ	35-113-32241	13313	PA_PROD
35-113-32122	1203A	PA_PROD	35-113-32242	13314W	P&A_INJ
35-113-32123	11306A	P&A_INJ	35-113-32243	13315	PA_PROD
35-113-32167	9312	PA_PROD	35-113-32244	13316W	P&A_INJ
35-113-32169	14502W	P&A_INJ	35-113-32245	13101	PA_PROD
35-113-32170	14504W	P&A_INJ	35-113-32246	13401	SI_OIL
35-113-32171	12415	PA_PROD	35-113-32247	13102W	P&A_INJ
35-113-32172	12815W	P&A_INJ	35-113-32248	13402	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-32249	13103	PA_PROD	35-113-32373	13702W	P&A_INJ
35-113-32250	13403W	P&A_INJ	35-113-32374	13703	SI_OIL
35-113-32251	13104W	P&A_INJ	35-113-32375	13704W	SI_WINJ
35-113-32252	13404	SI_OIL	35-113-32376	13705	SI_OIL
35-113-32253	13105	P&A_INJ	35-113-32377	13707W	P&A_INJ
35-113-32254	13405W	P&A_INJ	35-113-32378	13708	PA_PROD
35-113-32255	13406	SI_OIL	35-113-32379	13709	OIL
35-113-32257	13407W	P&A_INJ	35-113-32380	13710W	SI_WINJ
35-113-32258	13108W	P&A_INJ	35-113-32381	13711	PA_PROD
35-113-32259	13408W	SI_WINJ	35-113-32382	13613	P&A_INJ
35-113-32260	13109W	P&A_INJ	35-113-32384	13501	PA_PROD
35-113-32261	13409W	SI_WINJ	35-113-32458	14102A	SI_OIL
35-113-32262	13110	PA_PROD	35-113-32459	14105	PA_PROD
35-113-32263	13410W	SI_WINJ	35-113-32461	14001	PA_PROD
35-113-32264	13111W	SI_WINJ	35-113-32462	14101	SI_OIL
35-113-32265	13112	PA_PROD	35-113-32463	1403	DRY
35-113-32266	13113W	P&A_INJ	35-113-32464	14103	PA_PROD
35-113-32267	13114	OIL	35-113-32465	14104	PA_PROD
35-113-32268	13115	PA_PROD	35-113-32467	14005W	P&A_INJ
35-113-32285	14601	PA_PROD	35-113-33494	101	PA_PROD
35-113-32286	14602	PA_PROD	35-113-33495	102	DRY
35-113-32287	14603	P&A_INJ	35-113-33496	402	SI_OIL
35-113-32288	14604	DRY	35-113-33497	103	DRY
35-113-32355	13806	SI_OIL	35-113-33498	403	PA_PROD
35-113-32356	13801W	PA_PROD	35-113-33498	403A	SI_OIL
35-113-32357	13802	PA_PROD	35-113-33499	404	OIL
35-113-32358	13803	SI_OIL	35-113-33500	405	P&A_INJ
35-113-32359	13804	SI_OIL	35-113-33501	406	PA_PROD
35-113-32360	13902W	SI_WINJ	35-113-33502	408W	P&A_INJ
35-113-32361	13807	P&A_INJ	35-113-33503	814	PA_PROD
35-113-32362	13808	SI_OIL	35-113-33504	815	P&A_INJ
35-113-32363	13809W	P&A_INJ	35-113-33506	1402	OIL
35-113-32364	13814W	SI_WINJ	35-113-33507	1403W	W_INJ
35-113-32365	13815W	P&A_INJ	35-113-33508	1404	SI_OIL
35-113-32366	13816	DRY	35-113-33509	1405W	W_INJ
35-113-32367	13810W	P&A_INJ	35-113-33510	1406	PA_PROD
35-113-32368	13811	SI_OIL	35-113-33511	1407	OIL
35-113-32369	13812W	PA_PROD	35-113-33512	1408	PA_PROD
35-113-32370	13616W	P&A_INJ	35-113-33513	1409	P&A_INJ
35-113-32371	13901	OIL	35-113-33514	1410W	P&A_INJ
35-113-32372	13701	SI_OIL	35-113-33515	1411	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33516	1412	PA_PROD	35-113-33558	1613	P&A_INJ
35-113-33517	1413	OIL	35-113-33559	1013	PA_PROD
35-113-33518	1414	OIL	35-113-33560	1614	PA_PROD
35-113-33519	1415	P&A_INJ	35-113-33561	1514	PA_PROD
35-113-33520	1416W	P&A_INJ	35-113-33562	1014	P&A_INJ
35-113-33521	901	PA_PROD	35-113-33563	1515	PA_PROD
35-113-33522	1501	OIL	35-113-33564	1615A	PA_PROD
35-113-33523	1601	OIL	35-113-33565	1015	PA_PROD
35-113-33524	1001	OIL	35-113-33566	1516	PA_PROD
35-113-33525	1502	OIL	35-113-33567	1616	P&A_INJ
35-113-33526	1602	OIL	35-113-33568	1016	PA_PROD
35-113-33527	1002	PA_PROD	35-113-33569	1517	UNKNW
35-113-33528	1503	OIL	35-113-33570	1201	OIL
35-113-33529	1603	OIL	35-113-33571	1701	OIL
35-113-33530	1003	PA_PROD	35-113-33572	1702	OIL
35-113-33531	1504	OIL	35-113-33573	1202	OIL
35-113-33532	1604	OIL	35-113-33574	1102	OIL
35-113-33533	1004	PA_PROD	35-113-33575	1703	OIL
35-113-33534	1505	PA_PROD	35-113-33576	1203	OIL
35-113-33535	1605	PA_PROD	35-113-33577	1103	SI_OIL
35-113-33536	1005	PA_PROD	35-113-33578	1104	OIL
35-113-33537	1506	P&A_INJ	35-113-33579	1704	OIL
35-113-33538	1606W	WAG	35-113-33580	1204	OIL
35-113-33539	1006	P&A_INJ	35-113-33581	1101	PA_PROD
35-113-33540	1607	P&A_INJ	35-113-33582	1705	PA_PROD
35-113-33541	1507	PA_PROD	35-113-33583	1205	P&A_INJ
35-113-33542	1007	PA_PROD	35-113-33584	1105W	WAG
35-113-33543	1508W	WAG	35-113-33585	1706	PA_PROD
35-113-33544	1608	PA_PROD	35-113-33586	1206	PA_PROD
35-113-33545	1008	P&A_INJ	35-113-33587	1106	PA_PROD
35-113-33546	1609	OIL	35-113-33588	1707	P&A_INJ
35-113-33547	1009	OIL	35-113-33589	1207W	P&A_INJ
35-113-33548	1510	P&A_INJ	35-113-33590	1107	P&A_INJ
35-113-33549	1610	OIL	35-113-33591	1208	P&A_INJ
35-113-33550	1010	OIL	35-113-33592	1708	PA_PROD
35-113-33552	1511W	P&A_INJ	35-113-33593	1108	PA_PROD
35-113-33553	1611	PA_PROD	35-113-33594	1109	OIL
35-113-33554	1011	PA_PROD	35-113-33595	1110	OIL
35-113-33555	1612	OIL	35-113-33596	1711	OIL
35-113-33556	1012	OIL	35-113-33597	1211	OIL
35-113-33557	1513	PA_PROD	35-113-33598	1111	OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33599	1112	OIL	35-113-33639	3015	P&A_INJ
35-113-33600	1212	OIL	35-113-33640	3016	P&A_INJ
35-113-33601	1213	PA_PROD	35-113-33641	3817	PA_PROD
35-113-33602	1713	PA_PROD	35-113-33642	4705	PA_PROD
35-113-33602	1713A	WAG	35-113-33643	4901	TA_OIL
35-113-33603	1113	PA_PROD	35-113-33645	4902	PA_PROD
35-113-33604	1714	PA_PROD	35-113-33646	3902	SI_OIL
35-113-33605	1214	P&A_INJ	35-113-33647	3903	TA_OIL
35-113-33606	1114	PA_PROD	35-113-33648	4903	TA_OIL
35-113-33607	1215	PA_PROD	35-113-33649	3904	PA_PROD
35-113-33608	1715W	WAG	35-113-33649	3904A	SI_OIL
35-113-33609	1115	PA_PROD	35-113-33650	4904	PA_PROD
35-113-33610	1716	PA_PROD	35-113-33650	4904A	PA_PROD
35-113-33611	1216	PA_PROD	35-113-33651	4905	P&A_UNKW
35-113-33612	1116	P&A_INJ	35-113-33652	3906	PA_PROD
35-113-33613	1117	P&A_INJ	35-113-33653	4906	P&A_UNKW
35-113-33614	18106W	UNKNW	35-113-33654	3907W	P&A_INJ
35-113-33615	2617	PA_PROD	35-113-33655	4907W	W_INJ
35-113-33616	2401	OIL	35-113-33656	4908	P&A_INJ
35-113-33617	2402	OIL	35-113-33659	3909	OIL
35-113-33618	2403	OIL	35-113-33660	4910	PA_PROD
35-113-33619	2404	OIL	35-113-33660	4910A	TA_OIL
35-113-33620	2405	PA_PROD	35-113-33661	3911	OIL
35-113-33621	2406	P&A_INJ	35-113-33662	4911	SI_OIL
35-113-33622	2407	PA_PROD	35-113-33663	4912	PA_PROD
35-113-33623	2408	P&A_INJ	35-113-33664	3912	OIL
35-113-33624	2409	OIL	35-113-33665	3913	PA_PROD
35-113-33625	2410	OIL	35-113-33666	4913	P&A_INJ
35-113-33626	2411	OIL	35-113-33667	3914	PA_PROD
35-113-33627	2412	OIL	35-113-33668	4914	PA_PROD
35-113-33628	2413	PA_PROD	35-113-33669	3915	PA_PROD
35-113-33629	2414	PA_PROD	35-113-33670	4915	PA_PROD
35-113-33630	2415	P&A_INJ	35-113-33671	3916	PA_PROD
35-113-33630	2415A	WAG	35-113-33672	4916	PA_PROD
35-113-33631	2416	P&A_INJ	35-113-33673	4801	PA_PROD
35-113-33632	3005	P&A_INJ	35-113-33674	4802	P&A_INJ
35-113-33633	3007	PA_PROD	35-113-33674	4802AW	SI_WINJ
35-113-33635	3009	PA_PROD	35-113-33675	4803W	TA_INJ
35-113-33636	3010	PA_PROD	35-113-33676	4804	PA_PROD
35-113-33637	3013	PA_PROD	35-113-33677	4805	SI_OIL
35-113-33638	3014	OIL	35-113-33678	4806W	P&A_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33679	4807W	P&A_INJ	35-113-33718	5015	OIL
35-113-33680	4808A	OIL	35-113-33719	4215	P&A_INJ
35-113-33681	4809	PA_PROD	35-113-33720	5016	PA_PROD
35-113-33682	4810	TA_OIL	35-113-33721	4216	PA_PROD
35-113-33683	4811	PA_PROD	35-113-33722	4117	PA_PROD
35-113-33684	4812	PA_PROD	35-113-33723	6701	PA_PROD
35-113-33685	4813W	TA_INJ	35-113-33724	6601	P&A_INJ
35-113-33686	4814W	SI_WINJ	35-113-33725	5901	SI_OIL
35-113-33687	4815W	P&A_INJ	35-113-33726	5801W	W_INJ
35-113-33688	4816W	W_INJ	35-113-33727	5902	PA_PROD
35-113-33689	3910	OIL	35-113-33728	6702	P&A_INJ
35-113-33690	5001	SI_OIL	35-113-33729	6602	PA_PROD
35-113-33691	4201	PA_PROD	35-113-33731	5802W	SI_WINJ
35-113-33691	4201A	TA_OIL	35-113-33732	6703	OIL
35-113-33692	5002W	W_INJ	35-113-33733	5903	PA_PROD
35-113-33693	4202	PA_PROD	35-113-33734	6603W	SI_WINJ
35-113-33693	4202A	TA_OIL	35-113-33735	5803	PA_PROD
35-113-33694	5003	PA_PROD	35-113-33736	5804	PA_PROD
35-113-33695	4203	TA_OIL	35-113-33737	6704	SI_OIL
35-113-33696	5004	SI_OIL	35-113-33738	5904	PA_PROD
35-113-33697	4204	PA_PROD	35-113-33739	6604	PA_PROD
35-113-33698	4205	PA_PROD	35-113-33740	6705	PA_PROD
35-113-33699	5005	PA_PROD	35-113-33741	6705A	PA_PROD
35-113-33700	5006	TA_OIL	35-113-33742	6605	PA_PROD
35-113-33701	4206	P&A_INJ	35-113-33743	5905	PA_PROD
35-113-33702	5007	PA_PROD	35-113-33744	5805	PA_PROD
35-113-33703	4207	PA_PROD	35-113-33745	6706	PA_PROD
35-113-33704	5028W	SI_WINJ	35-113-33746	6606	SI_OIL
35-113-33705	4208	PA_PROD	35-113-33747	5906	PA_PROD
35-113-33706	5009	OIL	35-113-33748	5806	SI_OIL
35-113-33707	4209	PA_PROD	35-113-33749	6707	OIL
35-113-33708	5010	PA_PROD	35-113-33750	5907	P&A_INJ
35-113-33709	4210	SI_OIL	35-113-33751	6607	SI_OIL
35-113-33710	5011W	SI_WINJ	35-113-33752	5807	SI_OIL
35-113-33711	4211	PA_PROD	35-113-33753	5808	P&A_INJ
35-113-33712	5012	TA_OIL	35-113-33754	5908	SI_OIL
35-113-33713	4212	PA_PROD	35-113-33755	6608	SI_OIL
35-113-33714	5013	PA_PROD	35-113-33756	6709	PA_PROD
35-113-33715	4213	PA_PROD	35-113-33757	6609W	P&A_INJ
35-113-33716	5014	P&A_INJ	35-113-33758	5909	PA_PROD
35-113-33717	4214	PA_PROD	35-113-33759	5809	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33760	6710	SI_OIL	35-113-33800	5713	PA_PROD
35-113-33761	6610	PA_PROD	35-113-33801	5714	P&A_INJ
35-113-33762	5910	SI_OIL	35-113-33802	5703	OIL
35-113-33763	5810	PA_PROD	35-113-33803	6510	PA_PROD
35-113-33764	5811	SI_OIL	35-113-33804	6512	SI_OIL
35-113-33765	6711	PA_PROD	35-113-33805	5712	SI_OIL
35-113-33766	5911	SI_OIL	35-113-33806	6513W	W_INJ
35-113-33767	6712	PA_PROD	35-113-33807	5715	PA_PROD
35-113-33768	5912	PA_PROD	35-113-33808	6401	P&A_INJ
35-113-33769	5812	SI_OIL	35-113-33809	6402	SI_OIL
35-113-33770	5913	PA_PROD	35-113-33810	6403	PA_PROD
35-113-33771	6713	PA_PROD	35-113-33811	6404	P&A_INJ
35-113-33772	5813	PA_PROD	35-113-33812	6405W	P&A_INJ
35-113-33773	6714	P&A_INJ	35-113-33813	6406	PA_PROD
35-113-33774	5914	PA_PROD	35-113-33814	5601	PA_PROD
35-113-33775	5814W	W_INJ	35-113-33815	5602W	P&A_INJ
35-113-33776	5915	P&A_INJ	35-113-33816	5603	PA_PROD
35-113-33777	6715	PA_PROD	35-113-33817	5604	PA_PROD
35-113-33778	5815	SI_OIL	35-113-33818	5605W	SI_WINJ
35-113-33779	6716	PA_PROD	35-113-33819	5606	PA_PROD
35-113-33780	5916	PA_PROD	35-113-33820	5607	SI_OIL
35-113-33781	5816	DRY	35-113-33821	5608	OIL
35-113-33782	6501	SI_WINJ	35-113-33822	5609	OIL
35-113-33783	5701	SI_OIL	35-113-33823	5610W	P&A_INJ
35-113-33784	6502	PA_PROD	35-113-33824	5611	SI_SWD
35-113-33785	5702	OIL	35-113-33828	7401	SI_OIL
35-113-33786	6503	PA_PROD	35-113-33829	7402	SI_OIL
35-113-33786	6503A	PA_PROD	35-113-33830	7403	SI_OIL
35-113-33787	6504	PA_PROD	35-113-33831	7404	PA_PROD
35-113-33788	5704	SI_OIL	35-113-33832	7405	P&A_INJ
35-113-33789	6505	SI_OIL	35-113-33833	7406	SI_OIL
35-113-33790	5705	PA_PROD	35-113-33834	7407	PA_PROD
35-113-33791	6506	SI_OIL	35-113-33835	7408	SI_OIL
35-113-33792	5706	PA_PROD	35-113-33836	7410	PA_PROD
35-113-33793	5707	PA_PROD	35-113-33837	7411	PA_PROD
35-113-33794	6508	SI_OIL	35-113-33838	7412	PA_PROD
35-113-33795	5708	PA_PROD	35-113-33839	7301	PA_PROD
35-113-33796	6509	SI_OIL	35-113-33840	7302A	SI_OIL
35-113-33797	5709	SI_OIL	35-113-33841	7303	PA_PROD
35-113-33798	5710	PA_PROD	35-113-33842	7304	PA_PROD
35-113-33799	6511	OIL	35-113-33843	8201	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33844	8309	SI_OIL	35-113-33896	2904	PA_PROD
35-113-33845	8312	SI_OIL	35-113-33897	2911	PA_PROD
35-113-33846	8313	PA_PROD	35-113-33898	2912	PA_PROD
35-113-33848	8401	PA_PROD	35-113-33899	3701	PA_PROD
35-113-33849	8402	PA_PROD	35-113-33900	3702	SI_OIL
35-113-33850	8503	SI_OIL	35-113-33902	3601	PA_PROD
35-113-33851	8414	PA_PROD	35-113-33903	3602	PA_PROD
35-113-33856	8409	PA_PROD	35-113-33904	3603	PA_PROD
35-113-33857	8410	PA_PROD	35-113-33905	3604	PA_PROD
35-113-33858	8411	PA_PROD	35-113-33906	3605	SI_OIL
35-113-33859	8412	P&A_INJ	35-113-33907	3606	SI_OIL
35-113-33860	8413	PA_PROD	35-113-33908	3607	PA_PROD
35-113-33861	8414	PA_PROD	35-113-33909	3608	PA_PROD
35-113-33862	8415	PA_PROD	35-113-33910	3609	P&A_INJ
35-113-33863	8416	PA_PROD	35-113-33912	3611	SI_OIL
35-113-33864	8417	PA_PROD	35-113-33913	3612	PA_PROD
35-113-33865	7506	PA_PROD	35-113-33914	3613	PA_PROD
35-113-33866	7616W	SI_WINJ	35-113-33915	3614	PA_PROD
35-113-33867	7501W	P&A_INJ	35-113-33916	2707	PA_PROD
35-113-33868	7502W	W_INJ	35-113-33917	2713	PA_PROD
35-113-33869	7503W	P&A_INJ	35-113-33918	2714	TA_OIL
35-113-33870	7513W	W_INJ	35-113-33919	2715	PA_PROD
35-113-33871	7601W	W_INJ	35-113-33920	2716	PA_PROD
35-113-33872	7602W	P&A_INJ	35-113-33921	2802	PA_PROD
35-113-33873	7603W	P&A_INJ	35-113-33922	2803	PA_PROD
35-113-33874	7604	SI_OIL	35-113-33923	2804	PA_PROD
35-113-33875	7604W	W_INJ	35-113-33924	2805	PA_PROD
35-113-33876	8401W	SI_WINJ	35-113-33925	2806W	P&A_INJ
35-113-33877	8402W	P&A_INJ	35-113-33926	2807	PA_PROD
35-113-33878	8403W	W_INJ	35-113-33927	2808	PA_PROD
35-113-33886	2901	PA_PROD	35-113-33928	2809	PA_PROD
35-113-33887	2902	PA_PROD	35-113-33930	2811	PA_PROD
35-113-33888	2903	PA_PROD	35-113-33931	2812	PA_PROD
35-113-33889	2905	PA_PROD	35-113-33932	2813	PA_PROD
35-113-33890	2906	SI_OIL	35-113-33933	2814	PA_PROD
35-113-33891	2907	PA_PROD	35-113-33934	2815	PA_PROD
35-113-33892	2908	PA_PROD	35-113-33935	2816	PA_PROD
35-113-33893	2909	P&A_INJ	35-113-33936	5201	OIL
35-113-33894	2910	PA_PROD	35-113-33937	5202	OIL
35-113-33895	2913	PA_PROD	35-113-33938	5203	P&A_INJ
35-113-33895	2913A	PA_PROD	35-113-33939	5204	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-33941	5206	PA_PROD	35-113-34015	6004	PA_PROD
35-113-33942	5207	PA_PROD	35-113-34016	6005	SI_OIL
35-113-33943	5209	OIL	35-113-34017	6006	PA_PROD
35-113-33944	5212	PA_PROD	35-113-34018	6007	PA_PROD
35-113-33945	5213A	DRY	35-113-34019	6008	PA_PROD
35-113-33946	5213	DRY	35-113-34020	6009	PA_PROD
35-113-33947	5214	PA_PROD	35-113-34021	6010	PA_PROD
35-113-33948	5215	PA_PROD	35-113-34022	6011	PA_PROD
35-113-33949	5216	P&A_INJ	35-113-34023	6012	PA_PROD
35-113-33950	5208	PA_PROD	35-113-34024	6013	PA_PROD
35-113-33951	5210	P&A_INJ	35-113-34025	6014	PA_PROD
35-113-33952	5211	OIL	35-113-34026	6015	P&A_INJ
35-113-33953	4416	PA_PROD	35-113-34027	6016	PA_PROD
35-113-33954	5501	PA_PROD	35-113-34028	6017	PA_PROD
35-113-33955	5502	PA_PROD	35-113-34029	7701W	P&A_INJ
35-113-33956	5503	PA_PROD	35-113-34030	7702W	W_INJ
35-113-33957	4502	PA_PROD	35-113-34031	7703W	P&A_INJ
35-113-33958	4503	PA_PROD	35-113-34032	7704W	W_INJ
35-113-33959	5504	PA_PROD	35-113-34033	7705W	W_INJ
35-113-33960	4504	PA_PROD	35-113-34034	7708W	P&A_INJ
35-113-33961	5505	PA_PROD	35-113-34035	7801W	W_INJ
35-113-33962	4505	PA_PROD	35-113-34036	7802W	P&A_INJ
35-113-33963	546	PA_PROD	35-113-34037	7803W	P&A_INJ
35-113-33964	4506	PA_PROD	35-113-34038	7804W	P&A_INJ
35-113-33965	5507	PA_PROD	35-113-34039	7805W	SI_WINJ
35-113-33966	4507	SI_OIL	35-113-34040	7806W	P&A_INJ
35-113-33968	5408	PA_PROD	35-113-34042	7808W	P&A_INJ
35-113-33999	6301	PA_PROD	35-113-34043	8601W	P&A_INJ
35-113-34000	6302	PA_PROD	35-113-34044	8603W	P&A_INJ
35-113-34001	6303	PA_PROD	35-113-34045	8604W	P&A_INJ
35-113-34002	6304	PA_PROD	35-113-34046	8701W	W_INJ
35-113-34003	6305	PA_PROD	35-113-34047	8702W	P&A_INJ
35-113-34004	6306	PA_PROD	35-113-34048	8703W	W_INJ
35-113-34005	6307	P&A_INJ	35-113-34049	8704W	P&A_INJ
35-113-34007	6309	PA_PROD	35-113-34050	8705W	P&A_INJ
35-113-34008	6310	PA_PROD	35-113-34051	8706W	W_INJ
35-113-34009	6311	PA_PROD	35-113-34052	8707W	P&A_INJ
35-113-34010	6312	PA_PROD	35-113-34053	8708W	W_INJ
35-113-34011	6313	P&A_INJ	35-113-34054	7901W	P&A_INJ
35-113-34012	6001A	PA_PROD	35-113-34055	7902W	SI_WINJ
35-113-34014	6003	PA_PROD	35-113-34056	7903W	W_INJ

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-34057	7907W	SI_WINJ	35-113-36899	4601	PA_PROD
35-113-34058	8001W	SI_WINJ	35-113-36901	6002	PA_PROD
35-113-34059	8002W	SI_WINJ	35-113-36902	5205	PA_PROD
35-113-34060	8003W	P&A_INJ	35-113-36903	9906	PA_PROD
35-113-34061	8004W	P&A_INJ	35-113-36904	12210	PA_PROD
35-113-34062	8005W	SI_WINJ	35-113-36906	8001	PA_PROD
35-113-34063	8006W	P&A_INJ	35-113-36907	8002	PA_PROD
35-113-34064	8007AW	SI_WINJ	35-113-36964	7807W	P&A_INJ
35-113-34065	8008W	SI_WINJ	35-113-36965	7708A	PA_PROD
35-113-34066	8801W	P&A_INJ	35-113-37061	6701W	W_INJ
35-113-34067	8802W	P&A_INJ	35-113-37070	4525W	P&A_INJ
35-113-34068	8803W	SI_WINJ	35-113-37072	612	PA_PROD
35-113-34069	8804W	P&A_INJ	35-113-37072	612A	OIL
35-113-34070	8805W	SI_WINJ	35-113-37073	306	SI_OIL
35-113-34071	8806W	SI_WINJ	35-113-37075	1628W	P&A_INJ
35-113-34072	8901W	P&A_INJ	35-113-37080	2504A	OIL
35-113-34073	8902W	SI_WINJ	35-113-37082	6408	SI_OIL
35-113-34074	6001	SI_OIL	35-113-37083	2516	SI_OIL
35-113-34075	8903W	SI_WINJ	35-113-37083	2516A	OIL
35-113-34076	8904W	SI_WINJ	35-113-37102	12512	PA_PROD
35-113-34077	8908W	SI_WINJ	35-113-37105	9602W	P&A_INJ
35-113-34078	8817	DRY	35-113-37107	10910	SI_OIL
35-113-34079	7917	PA_PROD	35-113-37108	10914	PA_PROD
35-113-34080	14306	SI_OIL	35-113-37111	1824W	P&A_INJ
35-113-34081	8101W	P&A_INJ	35-113-37112	1228W	W_INJ
35-113-34082	8102W	P&A_INJ	35-113-37115	8302W	P&A_INJ
35-113-34083	8103W	P&A_INJ	35-113-37116	8322	UNKNW
35-113-34084	8105W	P&A_INJ	35-113-37117	8303	P&A_INJ
35-113-34085	9001W	P&A_INJ	35-113-37118	7304W	SI_WINJ
35-113-34086	9002W	P&A_INJ	35-113-37119	7405W	P&A_INJ
35-113-34087	9003W	P&A_INJ	35-113-37120	7406W	P&A_INJ
35-113-34088	9005W	P&A_INJ	35-113-37121	7407W	P&A_INJ
35-113-34089	8113	PA_PROD	35-113-37136	7505W	P&A_INJ
35-113-34090	8114	PA_PROD	35-113-37137	7605W	P&A_INJ
35-113-34091	8116	PA_PROD	35-113-37138	7506W	P&A_INJ
35-113-36813	9106	PA_PROD	35-113-37139	7507W	P&A_INJ
35-113-36894	10113	PA_PROD	35-113-37140	7608W	P&A_INJ
35-113-36894	10113A	SI_OIL	35-113-37142	7514	SI_OIL
35-113-36895	13805	SI_OIL	35-113-37151	2023W	P&A_INJ
35-113-36895	13805W	P&A_INJ	35-113-37152	12922	SI_OIL
35-113-36897	5309	PA_PROD	35-113-37172	339	PA_PROD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
35-113-37172	2509	OIL	35-113-41951	3329W	WAG
35-113-37172	3309	SI_OIL	35-113-41952	2629D	SI_SWD
35-113-37779	8W	P&A_INJ	35-113-41975	4429D	SWD
35-113-37780	12416AW	P&A_INJ	35-113-42088	5724W	W_INJ
35-113-37781	12901	P&A_INJ	35-113-42089	5725	OIL
35-113-37782	13116	PA_PROD	35-113-42090	5726	SI_OIL
35-113-37783	13004	PA_PROD	35-113-42091	5727	OIL
35-113-37784	13110A	SI_OIL	35-113-42092	3928	OIL
35-113-37785	13012W	SI_OIL	35-113-42093	4828	SI_WINJ
35-113-37851	501	OIL	35-113-42095	4928W	W_INJ
35-113-37852	1709	OIL	35-113-42096	3929	SI_WINJ
35-113-37853	1710	OIL	35-113-42097	4929	SI_OIL
35-113-37854	1712	PA_PROD	35-113-42098	4930	OIL
35-113-37856	2515	PA_PROD	35-113-42100	4932W	SI_WINJ
35-113-37858	8703	PA_PROD	35-113-42101	4933W	W_INJ
35-113-37867	504	OIL	35-113-42126	5129W	SI_WINJ
35-113-37874	511	PA_PROD	35-113-42139	4829	SI_OIL
35-113-37874	511A	OIL	35-113-42139	4929C	P&A_UNKW
35-113-37887	8409	PA_PROD	35-113-42142	13818W	P&A_INJ
35-113-37889	13106W	P&A_INJ	35-113-42357	5710A	SI_OIL
35-113-37904	10102W	P&A_INJ	35-113-42368	14008W	SI_WINJ
35-113-37905	9416W	P&A_INJ	35-113-43099	4931	SI_OIL
35-113-37906	3328W	WAG	35-113-43565	509	OIL
35-113-37907	7905W	W_INJ	35-113-43596	510	OIL
35-113-37965	1424W	WAG	35-113-43597	512	OIL
35-113-37986	8501	PA_PROD	35-113-43598	802	OIL
35-113-37987	7402W	SI_WINJ	35-113-43599	3201	OIL
35-113-37988	7401W	P&A_INJ	35-113-43601	5232W	W_INJ
35-113-38019	506W	WAG	35-113-43603	6612	OIL
35-113-41342	11127	OIL	35-113-43604	8605	SI_OIL
35-113-41908	5231D	SI_SWD	35-113-43605	6112	SI_OIL
35-113-41909	4228W	SI_WINJ	35-113-43606	9719	SI_OIL
35-113-41910	5128W	W_INJ	35-113-43607	9726W	W_INJ
35-113-41944	5133W	W_INJ	35-113-43608	9727W	SI_WINJ
35-113-41945	5031D	SI_SWD	35-113-43609	9737W	SI_WINJ
35-113-41946	5029W	SI_WINJ	35-113-43610	13107	OIL
35-113-41947	4230AW	SI_WINJ	35-113-43611	14004	SI_OIL
35-113-41947	4230W	P&A_INJ	35-113-43612	1901	PA_PROD
35-113-41948	4229W	W_INJ	35-113-43612	1901A	SI_OIL
35-113-41949	3428W	W_INJ	35-113-43613	1902	SI_OIL
35-113-41950	3430WS	SI_WSW	35-113-43614	1910	SI_OIL

API Number	Well Name and Well #	Well Type and Well Status
35-113-43615	1512	OIL
35-113-43616	12607	OIL
35-113-43617	12714	SI_OIL
35-113-43875	1441W	W_INJ
35-113-43877	3141W	WAG
35-113-43878	4041W	WAG
35-113-43879	3941W	WAG
35-113-43892	2341W	WAG
35-113-43893	2441W	WAG
35-113-43894	3142W	WAG
35-113-43904	2241W	W_INJ
35-113-43924	4042W	WAG
35-113-43963	1741W	WAG
35-113-44124	1541	OIL
35-113-44125	1542	OIL
35-113-44126	2442W	WAG
35-113-44213	3942W	W_INJ
35-113-44214	4043W	W_INJ
35-113-44320	3241W	WAG
35-113-44465	2541W	WAG
35-113-44466	3341W	WAG
35-113-44467	3841W	W_INJ
35-113-44468	2242W	W_INJ
35-113-44616	3242	OIL
35-113-44617	3143W	WAG
35-113-44670	2342	OIL
35-113-44697	2343	OIL
35-113-44864	541W	WAG
35-113-44866	642W	WAG
35-113-44874	1044	OIL
35-113-44878	1641	OIL
35-113-44885	942	OIL
35-113-44889	941	OIL
35-113-44918	2344	OIL
35-113-44926	842W	W_INJ
35-113-44927	1042	OIL
35-113-44928	1041	OIL
35-113-44931	943	OIL
35-113-44932	2542W	WAG
35-113-44933	1141WR	WAG
35-113-44936	1742W	WAG

API Number	Well Name and Well #	Well Type and Well Status
35-113-45252	452W	WAG
35-113-45291	852W	W_INJ
35-113-45292	2255	W_INJ
35-113-45293	3357W	WAG
35-113-45294	1855W	WAG
35-113-45315	1257W	W_INJ
35-113-45316	1748	OIL
35-113-45317	1853W	WAG
35-113-45318	1857W	WAG
35-113-45319	3052W	W_INJ
35-113-45321	3457W	W_INJ
35-113-45322	741	OIL
35-113-45332	2657W	WAG
35-113-45367	742	OIL
35-113-45369	3448	TA_OIL
35-113-45390	3453W	W_INJ
	3513AW	WAG_TBD
	3513AW	WAG_TBD
	3602AW	WAG_TBD
	5002AW	WAG_TBD
	5225AW	WAG_TBD
	5306AW	WAG_TBD
	5308AW	WAG_TBD
	5313AW	WAG_TBD
	5402AW	WAG_TBD
	5407AW	WAG_TBD
	5707AW	WAG_TBD
	5715AW	WAG_TBD
	5727AW	WAG_TBD
	5801AW	WAG_TBD
	5803AW	WAG_TBD
	5813AW	WAG_TBD
	5903AW	WAG_TBD
	5912AW	WAG_TBD
	5914AW	WAG_TBD
	5927AW	WAG_TBD
	6021AW	WAG_TBD
	6025AW	WAG_TBD
	6125AW	WAG_TBD
	6205AW	WAG_TBD
	6207AW	WAG_TBD

API Number	Well Name and Well #	Well Type and Well Status	API Number	Well Name and Well #	Well Type and Well Status
	6209AW	WAG_TBD		6213AW	WAG_TBD