



RUH STATE SOUTH PAD FLUID LEAK DETECTION PLAN

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Article I. Introduction

Location Information

This document provides site-specific information for the Ruh State South Pad within the Ruh State OGD. The information in this document relates specifically to the time during the construction, drilling, completion, and production of the eight (8) proposed horizontal wells on this location.

The proposed location is dryland crop on the west side of WCR 83 approximately 7392' south of the intersection with WCR 74. The Pad will be in the SENE of Section 11, Township 6 North, Range 62 West, Zoned Agricultural within Weld County Ag-Rural Planning Area. A 1041WOGLA Local Gov Permit was approved as 1041WOGLA22-0022.

The proposed Pad will be 10.90 acres, reduced to 8.54 after interim reclamation. The working pad surface will be 6.22 acres. The Pad is on Parcel 079711100004 owned by Marjorie L and William G Ruh. The location is currently used for farming.

The proposed production facility equipment for the Ruh State South Pad will be located within the Working Pad Surface adjacent to the wells and will consist of oil tanks, water tanks, meter buildings, separators, vapor recovery towers, compressors, vapor recovery units, LACT units, scrubbers, skids, pumps, and proposed electrical and/or solar equipment.

Phase	Duration (days)	Estimated Start Date
Construction	24	2 nd Quarter (May), 2024
Drilling	56	2 nd Quarter (June), 2024
Completion	56	3 rd Quarter (August), 2024
Flowback	90	3 rd Quarter (September), 2024
Production	9,150	4 th Quarter (November), 2024
Interim Reclamation	15	4 th Quarter (November), 2024*

**or the first favorable growing season.*

Article II. Drilling and Completion Fluids Procedures and Schedules

Monitoring

- A closed-loop system will be used for drilling operations as required by Rule 408.a.
- Operator will use SCADA to continuously monitor line pressures, flow rates, temperature, and whether valves are open or closed. Any fluctuations will be closely monitored and will trigger immediate action including shutting in and scheduling repair or replacement as necessary.

Inspection

- All facilities onsite shall be subjected to an instrument-based leak detection and repair (LDAR) inspection at least monthly during drilling and completion and quarterly during production.

Testing

- Volumetric Testing Involves measurement of liquid volume which must be added or removed from system to maintain constant pressure; volume changes indicate either leaks or thermal expansion/contraction of liquid.

Maintenance

- Operator utilizes additional engineering controls, which may include selection of appropriate materials, use of corrosion inhibitors, use of protective coatings, and cathodic protection techniques to minimize the potential for fluid leaks.

Article III. Produced Fluids Procedures and Schedules

Monitoring

- Site visits are made at least once every 48 hours by lease operators (aka pumpers) to the well pad for maintenance issues including leaks and spill potential. Periodic site inspections will be conducted by 3rd party environmental contractors to look for any signs of leaks and or potential leaks.
- Fluid Monitoring in tanks will be achieved through high level alarms installed in each tank with floating tank level gauges. These gauges report remotely tank volumes via telemetry. This telemetry allows pumpers to have real time access to information and review levels daily. Pumpers also have the ability to program the wells to be shut in automatically in the event of pressure loss.
- The location will utilize a SCADA (remote monitoring) system to monitor facility pressures and flows. Sensors are placed on multiple points throughout the facility and are designed to measure the system for irregularities that would indicate a leak in the system or change in production of oil, water, or gas. The SCADA system is designed with alarms that are triggered by irregularities and will activate automatic shut-in of the well and facility.

Inspection

- Flowlines will be inspected per ECMC 1100 regulations.
- Infrared surveys will be used to identify any leaks coming from the flowlines on a regular basis.
- Tanks and tank berms will be formally inspected quarterly under the Spill Prevention Control and Countermeasures (SPCC) plan unless specific COAs warrant more frequent inspections. Tanks are also inspected daily by the lease operator (pumper) and contract water haulers, who have been trained to identify corrective actions on tanks/flowlines.

All equipment, including:

- | | |
|--------------------------|------------------------------|
| • wellheads | • Flanges and fittings |
| • separators | • Sampling connections |
| • tanks | • Compressors - seal failure |
| • heaters | • Pressure relief valves |
| • Pumps - improper seals | • Open pipe connections |
| • General-purpose valves | |

Are inspected for:

- | | |
|---------------------------------|---------------------------------|
| • failure of packing or O-Rings | • gasket failure or loose bolts |
|---------------------------------|---------------------------------|

- seal failure
- odors
- sound/vibration
- visual evidence of rust or stains

Testing

- New flowlines will be hydrotested to manufactures recommended levels before placed into use.
- Pressure testing of the flowlines is conducted on an annual basis.
- Documented Audio, Visual, and Olfactory (AVO) inspections and optical gas imaging surveys are conducted monthly by a third-party specialist.

Maintenance

- If a leak is discovered or suspected, the well will be shut in and the line will be hydrotested. If a leak is determined, the well remains shut in while the leak is located and repaired. Not until the line has passed hydrotesting, will the well be brought back online.

Article IV. Record Keeping

Spill response includes notifications, reporting, response actions, remediation, and corrective actions. Waste be properly classified as E&P or non-E&P wastes. For E&P waste, all spills greater than 1 barrel (outside containment) or greater than 5 barrels (inside containment) will be reported to the ECMC using a Form 19. Should remediation be required, Form 27 will also be submitted. Spills related to non-E&P waste will be managed in accordance with CDPHE and EPA regulations depending on the volume spilled. HERV employees and/or contractors track and clean up all spills, including those that are not reportable. HERV documents the monitoring process and copies of inspection and maintenance logs are available upon request.

Article V. Site-Specific BMP

- Spill prevention and response are addressed in training of employees and contractor personnel on at least an annual basis.
- The surface of the location will be plated with 6 inches of road base aggregate compacted to 4 inches that will deter releases from easily seeping into the soil. Operator will install an earthen berm and ditch system around the perimeter of location that would keep a release from moving out onto un-plated soil.
- No pits will be used on location, therefore pit level Indicators will not be used on location.
- Tank berms shall be constructed of steel rings with a synthetic or engineered liner and designed to contain 150% of the capacity of the largest tank. Containment berms shall be constructed and designed to prevent leakage and resist degradation from erosion or routine operation. Tertiary containment, such as an earthen berm, will be installed as required for Production Facilities within 500 feet of a down gradient surface water feature. All berms will be visually checked periodically to ensure proper working condition. The Ruh State South Pad is not within 500' of a downgradient surface water feature.
- Separator berms shall be constructed of steel rings. All berms will be visually checked periodically to ensure proper working condition. Containment berms shall be constructed and designed to prevent leakage and resist degradation from erosion or routine operation. Tertiary containment, such as an

earthen berm, will be installed as required for Production Facilities within 500 feet of a down gradient surface water feature. All berms will be visually checked periodically to ensure proper working condition. The Ruh State South Pad is not within 500' of a downgradient surface water feature.

- Berms or other secondary containment devices shall be constructed around crude oil, condensate, and produced water storage tanks and shall enclose an area sufficient to contain and provide secondary containment for one-hundred fifty percent (150%) of the largest single tank. Berms or other secondary containment devices shall be sufficiently impervious to contain any spilled or released material. All berms and containment devices shall be inspected at regular intervals and maintained in good condition.
- Tertiary containment, such as an earthen berm, will be installed as required for Production Facilities within 500 feet of a down gradient surface water feature. All berms will be visually checked periodically to ensure proper working condition. The Ruh State South Pad is not within 500' of a downgradient surface water feature.
- During drilling and completions operations a temporary impermeable synthetic or geosynthetic liner will be utilized under equipment. This liner will be installed on top of the plated surface and will provide an additional layer of protection against spills. Secondary containment devices, such as duck ponds or equivalent type products, will be used to protect any pipe connections or equipment that carry, mix, or could possibly leak fluids or chemicals.
- All loadlines shall be bullplugged or capped.
- A sediment trap will be constructed to capture any sediment prior to leaving the location. The sediment trap has been sized in accordance with good engineering practices. A temporary diversion, consisting of a cut swale and compacted earthen berm, will be constructed along the pad edge and routed to the sediment trap to prevent offsite migration of sediment/contaminant into the nearby surface water features. If necessary, check dams will be constructed within the swale.
- All flowlines are designed/constructed/tested to ASME B31.4 and API 1104 standards. Only materials with Material Test Reports (MTRs) provided by the pipeline supplier are used in the construction of the flowlines.
- Audio, Visual, and Olfactory (AVO) inspections of the facility are conducted at least once every 48 hours by HERV employees and/or contractors. Any valve or fitting that is found to be ineffective is either repaired immediately or well shut-in procedures are implemented.
- Location will be equipped with remote monitoring capability including tank level alarms.
- Equipment and transfer lines will be monitored daily during well drilling and completion for signs of drips, leaks, or spills, which will be corrected promptly.
- Similar to production, AVO inspections include a comprehensive evaluation of all pre-production equipment located on-site (tanks, engines, piping, etc.). In addition to frequent AVOs, the locations are manned and monitored on-site 24/7 during pre-production, and additional comprehensive inspections

are conducted for drilling and completions/workovers. During drilling activities, a pre-spud inspection is completed before moving to a new well.

- During drilling operations, regular Audio, Visual, and Olfactory Monitoring (AVO) inspections are performed on equipment containing hydrocarbons, fluids, or associated chemicals. AVO inspections include taking the time to look, smell and listen for leaks. The fluid management system used during drilling operations is monitored from the rig floor (“dog-house”) for changes in pressure, volume, or rate which are used as indicators for leak detection. In the event abrupt changes in operating conditions are identified on surface equipment used to manage fluids, the rig including transfer lines and storage tanks are inspected by personnel onsite. Operator utilizes an impermeable polyethylene liner beneath the drilling rig during drilling operations. The use of this liner prevents hydrocarbons and other fluids from reaching the soil in the unlikely event a leak does occur. The liner is inspected for integrity throughout drilling operations and maintenance/repair to the liner occurs as needed.
- During completion operations, regular AVO inspections are performed on all lines, tanks, totes, or other vessels containing hydrocarbon, fluids, or fluid additives as well as any lines through which hydrocarbons or other fluids pass through. The fluid transfer system used during completion operations is monitored from the on-site mobile command center for changes in pressure, volume, or rate which are used as indicators for leak detection. In the event abrupt changes in operating conditions are identified on equipment used to in fluid transfer, completions personnel are deployed to inspect the system including pumps, transfer lines and storage tanks. Operator utilizes an impermeable polyethylene liner beneath the completions equipment during completions operations. The use of this liner prevents hydrocarbons and other fluids from reaching the soil in the unlikely event a leak does occur. The liner is inspected for integrity throughout completions operations and maintenance/repair to the liner occurs as needed.

Article VI. Exhibits/References/Appendices

None.