



# BISON IV OPERATING, LLC

REMORA OGD

FLUID LEAK DETECTION PLAN

**Fluid Leak Detection Plan**  
**Bison IV Operating, LLC**  
**Remora OGD – Remora 6 Pad**

The Remora 6 Pad is located in SWNW of Township 4 South, Range 63 West, Section 6 in Arapahoe County, Colorado. The location is wholly located within an agricultural complex and zoned as such. The location is on fee surface.

The finished grade elevation of the Remora 6 Pad will be 5,600 feet above mean sea level. Total initial area of disturbance is planned to be 20.0 acres. Bison IV Operating, LLC (Bison) plans to reclaim 10.48 acres, leaving 9.52 acres of well pad disturbance for the life of production. Construction of the Location is anticipated to take approximately five weeks. Drilling will include sixteen (16) wells and is anticipated to be completed within five months. Completions and flowback are anticipated to be completed within three months and production operations will commence following flowback of each well.

Pending approval from Arapahoe County and the ECMC, the project schedule is as follows:

Phase	Duration (days)	Estimated Start Date
Construction	+/- 35 days	3 <sup>rd</sup> Quarter 2024
Drilling	+/- 104 days	4 <sup>th</sup> Quarter (December) 2024
Completion	+/- 60 days	1 <sup>st</sup> Quarter (March) 2025
Flowback	+/- 10 days	2 <sup>nd</sup> Quarter (May) 2025
Production	Ongoing +/- 30 years	2 <sup>nd</sup> Quarter (June) 2025
Interim Reclamation	+/- 30 days	2 <sup>nd</sup> Quarter (June) 2025*

*\*or the first favorable weather/growing season.*

**Drilling and Completions Leak Detection Measures**

The following Best Management Practices (BMP) and monitoring procedures will be utilized at the Remora location during drilling and completions to minimize the potential for fluid leaks and to ensure prompt discovery and mitigation should any occur.

- Use of pit-less drilling systems
- Use of closed-loop drilling systems
- Flowback and stimulation fluids will be contained within tanks and placed in secondary containment that are also placed in an area with downgradient perimeter berming
- Continuous offsite disposal of flowback water to minimize on-location storage
- Per ECMC Rule, prior to beginning completion operations, pressure testing will be conducted on surface equipment exposed to hydraulic fracturing pressure.
- Pressure will be monitored throughout completion operations
- Surrounding the pad with a system of ditches and berms that are intended to collect stormwater runoff and convey it around the edges of the pad.
  - The perimeter berm will also divert any off-site storm water drainage around the site and prevent flooding of the facilities on the site.
  - The perimeter berm will be sized to contain a 100-year storm event.

**Drilling and Completions Monitoring and Recordkeeping**

- Daily visual inspections of the flowback vessel and associated equipment
  - Visual inspection of all thief hatches, pressure relief valves, or other access points to ensure they are closed, latched, and seated

- Recordkeeping
  - Date, time, description of issues encountered, date and description of corrective actions if any, and personnel performing corrective actions
  - Records are maintained for a minimum of three years

### **Production Leak Detection Measures**

The following BMPs and monitoring procedures will be utilized at the Remora location during production operations to minimize the potential for fluid leaks and to ensure prompt discovery and mitigation should any occur.

- Secondary containment will be sized to contain 150% or more of the volume of the largest primary containment vessel within the secondary containment area.
  - Engineered containment berms would be designed and installed to prevent leakage and resist degradation from erosion or routine operation.
  - Secondary containment areas for tanks are constructed with a synthetic or engineered liner that contains all primary containment vessels and loadlines and will be mechanically connected to the steel ring to prevent leakage
  - Stormwater BMPs provide tertiary containment around the perimeter of the production facility.
  - Engineered containment berms constructed around separation equipment
- Production Facilities will be installed with automated fluid level monitoring, capable of alerting the operator in the event of a sudden change in fluid level
- Wells will be equipped with remote shut-in capability
- Corrosion protection for buried piping
- Load lines will be bull-plugged or capped and located inside secondary containment

To prevent fluid leaks or releases during production, the Remora location will have automated tank fluid level monitoring that will alert Bison in the event of a sudden change in pressure or fluid level. In addition, the wells will be equipped with remote shut-in capability.

Bison lease operators and Production staff will review Remora production records daily, including volumes and pressures, to identify irregularities with a tank or on-location flowlines. If an irregularity is detected that may indicate a potential release the suspected tank and/or flowline(s) will be removed from service, isolated, and either pressure tested or visibly inspected for indications of a potential leak, as soon as possible following discovery.

Bison will conduct daily Audio, Visual, and Olfactory (AVO) inspections of all tanks, visible flowlines, and valves. Furthermore, Bison will periodically conduct and document formal site-specific audits to inspect for general site conditions as well as the condition of tanks, flowlines, and containment structures. Statewide and site-specific Spill Prevention Control and Countermeasures (SPCC) plans will be implemented to address any possible spills associated with oil and gas operations. Bison conducts annual personnel training and will conduct and document formal SPCC inspections. All documented inspection records will be provided to the ECMC upon request.

### **Production Monitoring Requirements and Recordkeeping**

- Daily, facility wide AVO inspections
- Monthly facility wide Leak, Detection and Repair (LDAR) inspections with infrared cameras
- Pressure monitoring on vessels and sales meters
- Pressure testing on all piping prior to start of production
- Annual flowline pressure testing completed in accordance with ECMC Series 1104 Rules
- Enhanced design and operations and maintenance practices for storage tanks including
  - Conducting an engineering design analysis of the vapor control system to

- minimize tank leaks
- Regular inspection of separation, tank, combustion device, and compression equipment
- Storage tank and separator pressure monitoring and automatic well shut-ins
- Use of LACT and oil pipeline to minimize oil tank storage requirements onsite
- Records of above will be maintained for a minimum of three years.

To ensure flowline integrity, Bison will perform and document pressure testing, static head testing, and AVO inspections in accordance with ECMC Rule 1104, following the general safety requirements summarized in Rule 602. Testing and inspection records will be retained for a period of three years or as indicated by ECMC rules. The testing and inspection records will be provided to the ECMC upon request.

### **Leak Response**

If a fluid leak occurs, Bison lease operators and production staff will safely control and contain the release. Wells will be shut in, leaking valves will be closed, ignition sources will be eliminated, berms will be constructed on the downslope side of the leak, and absorbent socks or cloths will be utilized to soak up the fluids. Regardless of the volume released, Bison field staff will notify their supervisor who will immediately notify EHS staff to determine a response plan and reporting procedures in accordance with ECMC Rule 912.

Bison will conduct site investigation activities, field screening, and confirmation sampling activities in accordance with ECMC 900 Series Rules. If necessary, discrete soil and groundwater samples will be collected and analyzed pursuant to Rule 915 for contaminants of concern listed in ECMC Table 915-1, following the general sample collection guidance in Rule 915.e.(2) and Rule 915.e.(3). All waste generated will be managed and disposed of in accordance with Rules 905 and 906.

## **Summary of Applicable BMPs for Fluid Leak Detection Plan**

1. Minimization BMPs
  - a. AVO inspections
  - b. Inspections of all production equipment (tanks, separators, combustors, etc.), wellheads, temporary equipment, on-site aboveground flowlines
  - c. Approved Instrument Monitoring Method (AIMM) inspections.
  - d. Spill prevention training to all field employees
  - e. Spill response procedures
  - f. Use of pit-less drilling systems
  - g. Use of closed-loop drilling systems
  - h. Flowback and stimulation fluids are contained within tanks and placed in secondary containment that are also placed in an area with downgradient perimeter berming
  - i. Continuous offsite disposal of flowback water to minimize on-location storage
  - j. Surrounding the pad with a system of ditches and berms that are intended to collect stormwater runoff from the pad areas and convey it around the edges of the pad
  - k. Stormwater BMPs provide tertiary containment around the perimeter of the production facility.
  - l. Engineered containment berms constructed around separation equipment
  - m. Production Facilities are installed with automated fluid level monitoring, capable of alerting the operator in the event of a sudden change in fluid level
  - n. Wells equipped with remote shut-in capability
  - o. Corrosion protection for buried piping

