Rule 908.b(8) Operating Plan

Piceance Energy LLC
Harrison Creek Water Treatment Facility – DAF Unit

OA Project No. 014-0465

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PICEANCE ENERGY, LLC
HARRISON CREEK WATER TREATMENT FACILITY
OPERATING PLAN

A. Description

The Piceance Energy (Piceance) Harrison Creek Water Treatment Facility (facility) is receive, treat, and recycle water produced or recovered in Piceance's operations in the Piceance Basin for re-use in the drilling and completion of natural gas wells. The wells that will be contributing fluids to this facility are considered as one waste stream. Produced water will be transported via trucks and existing pipelines. Prior to transport of water to the facility, the production will be sent to 2-phase separators on location where the gas will be separated out and sent to the existing Mega Vega Compressor Facility (430003) in NE4 Sec. 22, T9S, R93W, 6th PM. The oil and water emulsion from the separators will be sent to production tanks on location and allowed to gravity separate. The produced water will then be transferred via buried water lines or trucking to the facility. The main water transfer will enter the facility via pipeline. However, water may be trucked in, if required, to ensure adequate storage space is available to support the active frac job. The facility will be composed of a series of tanks to provide additional separation and storage, a dissolved air floatation treatment system (DAF), and a water storage complex comprised of up to four water impoundments. Three of the impoundments will store treated water. When constructed, the fourth impoundment will be covered and used to store untreated water from the surge tanks.

During normal production operations the facility allows E&P waste to be gathered, treated and stored at a central facility. When deemed appropriate to Piceance's operations, solid and/or liquid waste will be trucked out of the facility for disposal at a permitted injection well or licensed disposal site. During active well drilling and completion operations, storage of the water in the facility will maximize the amount of water for reuse in drilling, completions and production activities.

Water stored at the facility will be transported to the facility via delivery trucks and an existing pipeline network. All process equipment required for the facility will be designed to prevent a single point of failure and to allow for maintenance on a single piece of equipment while continuing operation at target flow rates.

Surge tanks will provide homogenized water chemistry, steady flow rates to the DAF units, and allow efficient chemical dosages and mixing during treatment. Large surge tanks offer longer sustained operation and ability to take pumped in water directly to the process minimizing or negating use of the covered pond.

Inflows are distributed to the gun barrel tanks to handle maximum instantaneous flow rates while maintaining good oil-water separation. An individual gun barrel will be designed to handle the overall facility throughput rate.

DAF units are individually sized to handle facility overall throughput rates. The first phase of facility construction and operation will accommodate a single DAF unit. The surge tanks will buffer inflows to allow for an averaged sustained throughput. In later construction phases, dual DAF units will operate in series for added polishing of water outflows to minimize emissions.

Multiple condensate tanks allow operations to clean a tank of oil for sale by moving bottoms and waste to a second tank for additional emulsion breaking.

Multiple emulsion tanks allow for additional capacity of DAF emulsions as well as transfer of fluids between tanks to get to target phase levels within the fluids where clean water can be drawn off. They also allow for accumulation of final sludge to efficiently operate the filter press.

The current flow rate into the facility is anticipated to be approximately 360,000 barrels per month (BPM). The throughput will decrease as the gas and water production from the wells contributing to the facility declines over time. If Piceance begins active drilling in the area, the throughput will increase during stimulation flowback and then decline over the life of the wells. The anticipated maximum working capacity of the facility is approximately 800,000 barrels (bbls). Water levels in the impoundments will be monitored with a fluid level monitor to track fluctuation and to assure a minimum of two feet of freeboard in the impoundments at all times.

When drilling, completions or production can reuse the water, it will be transferred from the facility via trucks and/or pipeline into a secondary manifold. From the secondary manifold, the water will be directed to a transfer pump which will push the water to the requesting location via the pipeline network. As noted above, if the infrastructure is not in place to support transport via pipeline, then water will be trucked to and from the facility.

B. Dust and Moisture Control

The primary dust control measure used at the facility will be to apply water to the access road and facility site as needed to control dust during operation.

Piceance has incorporated the facility into its existing spill prevention, control, and countermeasure plan (SPCC) to prevent the discharge of petroleum products from storage tanks. The tanks have steel secondary containment. Piceance will comply with all appropriate Colorado Division of Oil and Public Safety standards associated with storage tanks and tank batteries. Refer to Piceance's Emergency Response Plan for specific emergency response procedures.

C. Sampling

One monitoring well is scheduled be sampled and tested twice a year, each spring and fall. Piceance proposes to continue to use the existing water well located at the unoccupied cabin east of the facility to monitor water quality. Copies of all test results will be provided to the COGCC within three (3) months of collecting the samples. Results of the monitoring program will be included in Piceance's annual 900 Series facility report to the Director of the COGCC. Any additional monitoring wells installed in proximity to the facility will be incorporated into this sampling schedule.

D. Inspection and Maintenance

The facility's fluid levels and leak detection will be monitored remotely by Piceance personnel (or their operator) via a Supervisory Control and Data Acquisition (SCADA) system.

A leak detection system will be installed to monitor for any leaks. Piceance will be using a transmitter that will be radio linked via a local Remote Terminal Unit (RTU) to an automated surveillance system. The presence of fluid will be traced in real time, logged, graphed and stored at Piceance's office. Alarms will be set to notify operators of the presence of fluids. The device will be installed in the leak detection trap via the PVC inspection pipe outlined in the construction drawings.

A water level monitor will be used to ensure a minimum of two feet of freeboard in the impoundment at all times. Piceance will be using a submersible pressure level sensor that will be radio linked via a local RTU to an automated surveillance system. The fluid level will be tracked in real time, logged, graphed and stored at Piceance's office. Alarms will be set to notify operations of unscheduled fluid fluctuations and levels. The device will be installed in a perforated PVC pipe near the leak detection PVC inspection pipe outlined in the construction drawings.

All pipelines transporting fluids to the facility will be pressure tested with water prior to initiating transport. Pipeline integrity will be monitored during operational activity via regular inspections of pressure gauges and valve sets at the facility.

When water is pumped to or from the facility, the water supervisor will be informed of the intention to pump with information as to what time and from where and expected duration and quantity. Once authorization to pump has been given by the water supervisor, personnel experienced in waste water management will walk entire surface systems inspecting all fittings and valves to ensure all are in good working condition and in proper alignment for water receipt at facility. Verification will be transmitted to all parties involved with job that pumping operations can commence. The pump system will be put on line and onsite flow volumes will be confirmed and field site will be notified. All valves will be placed in proper alignment before and after job. After pumping operations commence, verification that water flow has been established will be reported back to pumping crew (including flow volumes). All volumes will be cross checked after completion of the job to insure anticipated water volumes were pumped to/from the appropriate location. Metering records of all jobs including date, location, time and quantity will be kept and reported to proper personnel.

During normal operations, weekly inspections will be performed by a Piceance operator or designated representative. During the weekly inspection, the operator will perform the activities detailed in the "***Weekly Checklist***". Adherence to the criteria imbedded to the checklist will involve visual inspections of the facilities, visual inspections of equipment and tanks, assessment of the water impoundment levels, visual inspection for sheen on impoundments, recording meter values, visual inspections of stormwater BMPs, visual inspection of pond covers, visual inspection of wildlife fencing, and performance of general housekeeping activities. The operator will ensure that all equipment is in proper working order and that the inspection is documented. If there are any irregularities noted during the inspection, a supervisor shall be notified and (if required) an appropriate response plan will be coordinated to resolve the irregularities.

In addition to the weekly inspections, Piceance will conduct monthly inspections of the facility according the criteria identified in the "***Monthly Checklist***" document. During semi-annual inspections of the facility, items such as pond water sampling, leak detection piping, sampling

from test wells, sampling of monitoring springs and additional equipment inspections will take place as detailed in the "***Semi-Annual Checklist***". When deemed necessary by Piceance, the facility will be drained and given a full inspection. The schedule of these inspections may be modified by the COGCC as part of the State's approval process, but otherwise the inspections will take place on a weekly, monthly and semi-annual basis. All checklists will be revised, as necessary, to reflect current operating and regulatory requirements.

E. Emergency Response

To ensure a safe and timely response to emergency situations, Piceance will provide office personnel with contact information for the Mesa County Sheriff's Department, the local fire department, and emergency medical service providers. Piceance will provide local emergency response agencies with a detailed map showing the location of the proposed facility, detailed directions to it, and GPS coordinates to facilitate timely response. Since the facility would be located within an active field, roads will be well maintained and snow plowed in the winter to facilitate vehicle access. Piceance will install signage to adequately identify the entrance to the location.

In the case of a medical emergency, the type of action taken will depend on the severity of the medical emergency. Should a life threatening medical emergency arise, Piceance or its contractors would summon St. Mary's Care Flight in Grand Junction for helicopter response. Helicopter landing sites have been established in close proximity to the facility on the access road adjacent to the facility. The GPS locations of the landing site will be provided to office personnel for communication to first responders in the event of an incident. In the case of injuries or medical problems that are not life threatening, the injured worker would either be transported from the facility in a company or contractor vehicle to the nearest medical center for treatment or transportation by ambulance summoned to the site, depending on the circumstances.

Since the proposed water impoundment is located on a location that is clear of vegetation, the risk of wildfires is minimal. Smoking on-site and open fires will not be permitted at the facility.

The Plateau Valley Fire Protection District will be notified of the facility during the local land use permit review. Piceance will seriously consider incorporating appropriate recommendations into the Emergency Response Plan for this facility.

F. Record Keeping

As stated above, typical operation of the facility will include transferring water to and from the facility. It will be the responsibility of the operator to manage daily inputs and outputs to the facility. The operator will be in daily communication with the production staff, drilling staff and completions staff to track the produced water volumes entering the facility and track any water volumes pumped to Piceance's gas development locations. Based on the inputs from Piceance's production staff, the operator will then determine if pumping operations or adjustments are required. All water impoundment facility operations will fall under the control of Piceance's production operations group or delegate.

All records of the site inspections, including the daily logs, are created/filled in manually, signed by the responsible operator, and filed at Piceance's office for storage. Documents may also be scanned and stored in the appropriate electronic file for access by all management personnel. Piceance will manually record the facility operational parameters as well as generate electronic tracking and data storage to maintain safe operation of the facility.

G. Site Security

The site is located in a rural and remote area of Mesa County north of Collbran.

A locked gate is located at the beginning of Harrison Creek Road off of Hwy 330E. The facility is fenced to prevent access to the pond area by wildlife or domestic animals. All wildlife that may be inadvertently entrapped by the fencing will be immediately reported to the Colorado Division of Parks and Wildlife.

H. Hours of Operation

The proposed facility will operate 24 hours a day, 365 days a year. During active drilling, pumping could take place seven days a week, typically from 7:00 a.m. to 8:00 p.m. Personnel will be on site during pumping operations. The DAF facility will be manned 24/7. The impoundment facility typically will be unmanned; however, it will be monitored remotely by Piceance personnel or operator via a Supervisory Control and Data Acquisition (SCADA) system. Weekly inspections will be conducted by local operations personnel.

I. Noise and Odor Mitigation

Piceance does not anticipate any noise or odor issues with the proposed facility. Noise impacts will be controlled through the implementation of industry best management practices and per the issued local land use permit. The proposed facility will adhere to Mesa County, COGCC and CRS criteria for Residential/Agricultural/Rural zones. Impacts associated with odor will be mitigated via adherence to Colorado Department of Health and Environment (CDPHE) Air Quality permitting.

J. Final Disposition of Waste

If the accumulation of fluid in the impoundment exceeds the working capacity, it will be transported to a licensed disposal facility or permitted injection well. Accumulated sediment wastes and solids from the filter press will be transported to a licensed facility for disposal after sampling analysis has determined the chemical constituents of the materials.

K. Leak Detection Actions and Annual Reporting

If inspection of the leak detection system determines fluids are accumulating in the containment area as the result of a leak, the impoundment will be emptied to a point where the leak detection system is no longer detecting fluids. All liquids will be disposed of according to the appropriate local, state and federal regulations. If a leak is identified, it will be reported to the COGCC immediately and the appropriate action plans will be implemented. Action plans will be presented to the COGCC for review and input. Any evidence of contamination to groundwater will be reported immediately. All leaks will be managed in accordance with Rule 906.

To facilitate the annual review of this facility by the COGCC, Piceance will submit an annual 900 Series facility report summarizing operations, including the types and volumes of waste actually handled at the facility and the test results of all spring and monitoring well samples.

Piceance will notify the COGCC of all test results from monitoring wells and springs within three months of collecting the samples. Results of the monitoring program will also be included in Piceance's annual 900 Series report to the Director.

Any change in the status of the facility from produced water to fresh water or from fresh water to produced water will be reported to the COGCC via Form 4, Sundry Notice, and the change will be reported in the annual 900 Series report to the Director.

L. Facility Closure

When the facility is deemed to be at the end of its useful life, it will be closed according to the appropriate local, state and federal regulatory requirements for disposal of wastes. All accumulated wastes will be disposed of according to the regulatory requirements noted above. Methods for disposal of the accumulated wastes could include transport to a licensed facility, land farming or burial (depending upon the chemical constituents of the materials).

Piceance will submit a Form 4 Sundry Notice to the COGCC for approval prior to commencing closure of the facility. Piceance will collect pit water samples and analyze for compliance with Table 910-1 concentration levels.

APPENDIX A

Inspection Checklists

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HARRISON CREEK WATER TREATMENT FACILITY

Weekly Operations Checklist

Date _____

Inspector _____

Tanks and Appurtenant Equipment	Comments
Inspections Prior to Operation of the Facility	
Water Levels – Visual and Instrumentation Inspection	
Oil Staining or Debris – Visual Inspection	
Record Meter Values – In/Out	
Fencing – Visual Inspection	
Cover – Visual Inspection	
Weeds – Visual Inspection	
Berms – Visual Inspection	
Containment Liner – Visual Inspection	
Piping – Visual Inspection	
Valves – Inspect/Operate	
Pump Oil Levels and Leaks - Visual Inspection	
Odor – Detectable Level	
Stormwater BMPs – Visual Inspection	
General Housekeeping – Perform	
Notes:	

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HARRISON CREEK WATER TREATMENT FACILITY

Monthly Operations Checklist

Date _____

Operator _____

Tanks and Appurtenant Equipment	Comments
Typical Inspections of the Facility	
Housekeeping: Facility clean, free of unnecessary items	
Danger & Warning Signs: Posted & visible	
Fencing: Fencing intact, gates locked	
Cover: Visual Inspection	
Lighting: Adequate, lights functioning properly	
Equipment and Tank Soundness: No visible leaks, weeping or drips along seams, or tank bottoms	
Corrosion Protection: Sacrificial metals sufficient, impressed currents functioning, signs of rust or corrosion	
Vents: Clear	
Gauges & Overfill Devices: Gauges working & test overfill alarms and automatic shutoff	
Piping & Hoses Soundness:: No visible leaks, drip or cracks especially at supports, joints, elbows and fittings	
Valves: No visible leaks and in good working condition	
Coating, Wrapping and Paint: Wear, tear, chipping, no peeling, cracking or bleeding	
Secondary Containment: Clear, no standing water, snow, ice buildup or vegetation	
Liner Soundness: free of rips, tears and non-essential penetrations	
Notes:	

Piceance Energy

HARRISON CREEK WATER TREATMENT FACILITY

Semi-Annual Operations Checklist

Date _____

Operator _____

Tanks and Appurtenant Equipment	Comments
Typical Inspections of the Facility	
Housekeeping: Facility clean, free of unnecessary items	
Fire extinguishers: Adequate, accessible and charged	
No Smoking Signs: Posted and visible	
Danger & Warning Signs: Posted & visible	
Fencing: Fencing intact, gates locked	
Cover: Visual Inspection	
Lighting: Adequate, lights functioning properly	
Equipment and Tank Soundness: No visible leaks, weeping or drips along seams or tank bottoms	
Corrosion Protection: Sacrificial metals sufficient, impressed currents functioning, signs of rust or corrosion	
Tank Signs: Product stored, storage capacity, and fire hazard rating, posted and visible	
Vents: Clear	
Foundation: Solid, no cracks, or rotting	
Gauges & Overfill devices: Gauges working & test overfill alarms and automatic shutoff	
Piping & Hoses Soundness: No visible leaks, drip or cracks especially at supports, joints, elbows and fittings	
Valves: No visible leaks and in good working condition	
Protection: from falling snow and ice & traffic	
Coating, Wrapping and Paint: wear, tear, chipping, no peeling, cracking, or bleeding	
Secondary Containment: Clear, no standing water, snow, ice buildup or vegetation	
Liner Soundness: free of rips, tears, and non-essential penetrations	
Notes:	

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