



Facility ID #440582
Pit Facility ID#428147
N Parachute WF A15 596 Pit

Response to COGCC comments dated December 22, 2015

Encana Oil & Gas (USA) Inc.

January 2016



Form 28 Centralized E&P Waste Management Facility Permit

1. (Form 28, Attachment Checklist)

COGCC Comment: None.

2. (Form 28, Question 1) *Is the site in a sensitive area?*

COGCC Comment: None.

3. (Form 28, Question 2) *What are the average annual precipitation and evaporation rates for the site?*

COGCC Comment: None.

4. (Form 28, Question 3) *Has a description of the site's general topography, geology, and hydrology been attached?*

COGCC Comment: None.

5. (Form 28, Question 4) *Has a description of the adjacent land use been attached?*

COGCC Comment: None.

6. (Form 28, Question 5) *Has a 1:24,000 topographic map showing the site location been attached?*

COGCC Comment: None.

7. (Form 28, Question 6) *Has a site plan showing drainage patterns, diversion or containment structures, roads, fencing, tanks, pits, buildings and any other pertinent construction details been attached?*

COGCC Comment: None.

8. (Form 28, Question 7) *If site is not owned by operator, is written authorization of the surface owner attached?*

COGCC Comment: The supplemental information submitted indicates that Encana is the surface owner. Please clarify.

ECA Response: Encana is the surface owner.

9. (Form 28, Question 8) *Has a scaled drawing and survey showing the entire section(s) containing the proposed facility been attached?*

COGCC Comment: None.

10. (Form 28, Question 9) *What measures have been implemented to limit access to the facility by wildlife, domestic animals or by members of the public?*

COGCC Comment: None.

11. (Form 28, Question 10) *Is there a planned fire lane of at least 10 feet in width around the active treatment areas and within the perimeter fence?*

COGCC Comment: Rule 908.b.(5).D. Centralized facilities shall have a fire lane of at least ten (10) feet in width around the active treatment areas and within the perimeter fence. In addition, a buffer zone of at least ten (10) feet shall be maintained within the perimeter fire lane. Drawing NP-A15-P-100, of the submittal, does not indicate the required ten (10) foot fire lane around the pit. Please clarify.

ECA Response: A sundry has been submitted to request a variance to this Rule. Please see Document ID: 400926217

12. (Form 28, Question 11) *Is there an additional buffer zone of at least 10 feet in width within the perimeter fire lane?*

COGCC Comment: Please see previous comment above.

ECA Response: A sundry has been submitted to request a variance to this Rule. Please see Document ID: 400926217

13. (Form 28, Question 12) *Have surface water diversion structures been constructed to accommodate a 100-year, 24-hour event?*

COGCC Comment: None.

14. (Form 28, Question 13) *Has a waste profile been calculated according to rule 908.b.6?*

COGCC Comment: None.

15. (Form 28, Question 14) *Has facility design and engineering been provided as required by Rule 908.b.7?*

COGCC Comment: None.



16. (Form 28, Question 15) *Has an operating plan been completed as required by Rule 908.b.8?*

COGCC Comment: None.

17. (Form 28, Question 16) *Has ground water monitoring for the site been provided?*

COGCC Comment: Groundwater monitoring may be required at a later time.

ECA Response: Encana does not propose groundwater monitoring for this location. There is no shallow groundwater present at the site. Encana would like to request that if groundwater monitoring is to be required at this site it is specifically discussed and included in the approval of the Form 28. This would ensure clear expectations between the COGCC and Encana for future groundwater monitoring operations.

18. (Form 28, Question 17) *Has financial assurance been provided as required by Rule 704?*

COGCC Comment: Financial assurance of \$300,000.00 has been provided. The COGCC is currently having a third party review the closure of the facility and prepare an independent closure cost estimate. Based on the third party review, the financial assurance may be less than the estimated \$300,000.00 or more than the estimated \$300,000.00.

ECA Response: Encana has amended our financial assurance to the \$300,000. Bond No. 106272798

19. (Form 28, Question 18) *Has a closure plan been provided?*

COGCC Comment: None.

20. (Form 28, Question 19) *Have legal government requirements for zoning and construction been complied with?*

COGCC Comment: None.

21. (Form 28, Question 20) *Have permits and notifications required by local governments and other agencies been provided?*

COGCC Comment: None.



N Parachute WF A15 596 Pit COGCC Form 28 Supplemental Information

Overall Report

COGCC Comment: Provide a narrative history of the Location and Pit Facility use including all maintenance of pit and pit liner(s) and any leak detection testing of the existing pit liner(s) system.

ECA Response: A response to this question was provided with the Form 28 submission in 2014. Please refer to Document ID 2314334.

908.a: Applicability

COGCC Comment: Flowback and produced water from other oil and gas operators may be received by this facility on a case-by-case basis through a Rule 502.b variance request and approval, water sharing agreement in place, and permits from other agencies or local entities, if required.

ECA Response: Encana will obtain all required permits and comply with all regulations when proposing to receive flowback or produced water from other oil and gas operators at this facility.

1. 908.b.(1): Contact Information

COGCC Comment: None.

2. 908.b.(2): Surface Owner

COGCC Comment: None.

3. 908.b.(3): Legal Site Description:

COGCC Comment: None.

4. 908.b.(4) Topography, Geology and Hydrology

COGCC Comment: The average annual evaporation is indicated as 60 inches/year on the Form 28 and 57.45 inches/year in section 908.b.(4).3.6, please clarify.

ECA Response: The latest annual evaporation estimate for this site is 57.45 inches/year.

5. 908.b.(5).A: Site Plan

COGCC Comment: None.



6. 908.b.(5).B: Survey Drawings

COGCC Comment: Survey drawings included in Appendix Number 3 reference surface and bottom hole locations of the existing wells on the pad and do not reference the Pit. Please clarify.

ECA Response: A sundry has been submitted with an updated survey for the facility. The new survey references the pit and provides distances to the section lines. Please see Document ID: 400928770

7. 908.b.(5).C: Access Control Measures

COGCC Comment: None.

8. 908.b.(5).D: Fire Access

COGCC Comment: Rule 908.b.(5).D. Centralized facilities shall have a fire lane of at least ten (10) feet in width around the active treatment areas and within the perimeter fence. In addition, a buffer zone of at least ten (10) feet shall be maintained within the perimeter fire lane. The drawing referenced for the fire access around the pit does not show the required ten (10) foot fire lane around the pit. Please clarify.

ECA Response: A sundry has been submitted to request a variance to this Rule. Please see Document ID: 400926217

9. 908.b.(5).E: Surface Water Design

COGCC Comment: A site specific stormwater management plan for the Facility should be provided as opposed to the general North Parachute Ranch area Stormwater Management Plan.

ECA Response: The North Parachute Ranch Area Stormwater Plan (Form 28 Appendix 10) details the best management practices that are used to construct all well pads in the North Parachute Ranch area (Appendix E: Stormwater Manual of Best Management Practices (BMPs), Figures SI-2, SP-0, SP-2, D-2 and D-3). The run-on diversion ditch, rip-rap and other site specific, as-built grading for the A15 pad is shown on Drawing No. 18975-520-SIT-32202 (Form 28 Appendix 8). There is minimal run-off from the pad as the vast majority of the surface area is covered by the pit. The small volume of run-off that does exist flows to the south of the pad and is intercepted by the roadside ditch adjacent to the "existing access drive" (see NPR SWMP BMP Figure D-2: ""Access Road Intersection Well Pad Above Road").



10. 908.b.(6): Waste Profile

COGCC Comment: None.

11. 908.b.(7).A: Facility Design and Engineering-Geology

COGCC Comment: See comments under Appendix 8, Engineering Drawings. What was the purpose for advancing soil borings and installing monitoring wells to 85'?

12. 908.b.(7).B: Facility Design and Engineering – Hydrology

COGCC Comment: Contact information provided in the SPCC Plan and the Oil Spill Contingency Plan should be updated when changes of the contacts have been made. Appendix C.2 “Spill Reporting Flowchart – DJ Basin, Piceance, Paradox, Colorado” in the Oil Spill Contingency Plan should be updated to reflect current Rules and Regulations. Appendix C.5 “SRBU Regulatory Links” in the Spill and Environmental Release Reporting Practice” should be updated to reflect current Rules and Regulations”.

ECA Response: Encana updates our SPCC Plan at scheduled intervals as required by the EPA. Details of the Plan Maintenance program are set out in Section 7.1 of the SPCC Plan, which is located in Appendix 12 of the Form 28.

13. 908.b.(7).C: Facility Design and Engineering-Engineering Data

COGCC Response: The drawings show the upper liner as a 60 mil and lower liner as 40 mil. Rule 904.d specifies liners shall be 60 mil. Please clarify. Provide construction details for the offload pad.

ECA Response: The pit lining system comprises four layers: a 60 mil HDPE primary liner, a 200 mil geocomposite drainage underlayment, a 40 mil HDPE secondary liner, and a geosynthetic clay liner (GCL). The GCL was specifically constructed to provide a matting-type padding beneath the double synthetic liner system, as opposed to being used as the secondary liner itself as implied by Rule 904.d.(3). Encana believes that the total system is superior to two 60 mil HDPE liners.

A superior system was intentionally designed for this site because of its proximity to the West Fork of Parachute Creek. Encana takes the responsibility of protecting ground and surface water seriously. There is no evidence of groundwater at this site, no local water wells, and no geologic indication that a leak would impact the Creek. However, the system that was chosen combines a faster transmission rate / identification time for any



leak in the primary liner, and a near impermeable bentonite layer in addition to the mandated double synthetic liners.

Each component in the liner system was chosen for a specific engineering reason:

- a) 60 mil HDPE primary liner
 - a. Chosen to comply with Rule 904.d.(1).
- b) 200 mil geocomposite drainage underlayment
 - a. Chosen to provide improved leak detection (standard thickness is 40 mil) due to the sensitive nature of the site. The additional thickness allows any collected fluids to drain to the leak detection well sump faster and therefore be identified sooner.
- c) 40 mil HDPE secondary liner
 - a. Chosen to exceed the requirements of 904.c (Form 15 pits) while also providing a component within a wider system that exceeds the requirements of 904.d. (Form 28 pits) in the event that the pit was needed long term and a conversion was required.
- d) Geosynthetic clay liner
 - a. The new (2012) pit was constructed on the same site as a previous pit. Use of a highly engineered, low hydraulic conductivity GCL eliminated the need to overexcavate the bottom of the existing pit and then re-compact and test 24" of material. This foundation method complies with Rule 904.d.(3), which is an allowable alternative to 904.d.(2).
 - b. The hydraulic conductivity of the GCL is 5×10^{-13} cm/s (5×10^{-11} m/sec, as stated in the specification) which is substantially superior to the base layer foundation requirement of 1×10^{-7} cm/s in Rule 904.d.(2).
 - c. The GCL provides a near impermeable, non-penetrable barrier to prevent transmission of any produced water into native soil.

Overall, Encana believes this system provides a higher level of protection to public health, safety and welfare, including the environment and wildlife resources, than the minimum prescribed requirements in 904.d. and therefore that this system complies with all Rules and Regulations.

Specifications for the Earthwork and Pit Construction, Geosynthetic Clay Liner and Geocomposite Drainage Layer are included in Appendix 2 of the Form 28 submittal (they were included in the Form 15 submission for the pit in 2012).



Construction details for the offload pad are shown on drawing A-15-S-1 – Structural Sections and Details in Appendix 8 of the Form 28 submittal.

14. 908.b.(8): Operating Plan

COGCC Comment: None.

15. 908.b.(9).A: Water Wells

COGCC Comment: None.

16. 908.b.(9).B: Monitoring Wells

COGCC Comment: What was the purpose for advancing soil borings and installing monitoring wells to 85' that are dry?

ECA Response: The monitoring wells were drilled and installed as part of our comprehensive North Parachute Ranch water quality monitoring system.

17. 908.b.(10): Surface Water Monitoring

COGCC Comment: None.

18. 908.d: Financial Assurance

COGCC Comment: See previous comments on Financial Assurance.

ECA Response: Encana will amend our financial assurance once the third party review is completed and the bond value has been agreed with the COGCC.

19. 908.e: Facility Modifications

COGCC Comment: None.

20. 908.f: Annual Permit Review

COGCC Comment: Include the “contributing wells” API numbers in the Annual Permit Review.

ECA Response: Encana will submit the contributing wells API numbers in the Annual Permit Review.

21. 908.g.(1).A: Preliminary Closure Plan

COGCC Comment: Please see response to 908.d.



ECA Response: Encana will amend our financial assurance once the third party review is completed and the bond value has been agreed with the COGCC.

22. 908.g.(1).B: Preliminary Closure Cost

COGCC Comment: See previous comments on Financial Assurance.

ECA Response: Encana will amend our financial assurance once the third party review is completed and the bond value has been agreed with the COGCC.

23. 908.g.(2): Final Closure Plan

COGCC Comment: None.

24. 908.h: Other Permits and Notifications

COGCC Comment: None.

Appendices Review

Appendix 1: A15 Pit – Form 28

COGCC Comment: None.

Appendix 2: A15 Pit – Form 15

COGCC Comment: None.

Appendix 3: Survey Plots

COGCC Comment: The survey plots included with the submittal all reference the existing wells on the Location, this submittal requires a Survey plat referencing the Pit location adjacent to the Section lines. Please clarify.

ECA Response: A sundry has been submitted with an updated survey for the facility. The new survey references the pit and provides distances to the section lines. Please see Document ID: 400928770

Appendix 4: Topographic Maps

COGCC Comment: None.

Appendix 5: Surface Ownership Maps

COGCC Comment: None.



Appendix 6: Geology & Hydrology Report

COGCC Comment: None.

Appendix 7: Evaporation & Precipitation Data

COGCC Comment: None.

Appendix 8: Engineering Drawings

COGCC Comment: The Engineering Drawings included with the submittal are for the construction of the original A15 Pit. Are any modifications intended, please clarify.

ECA Response: The engineering drawings in Appendix 8 are the as-built construction drawings for the pit constructed in 2012. They were issued for construction on 01/05/2012 and the as-built was finalized on 08/29/2012. Please review Note 10 on Drawing No. 18675-520-SIT-32202 which instructs the liners to be removed from the old pit and for the old pit to be filled in as part of this project.

A15-M-2 – Offload Pad Mechanical Layout: What are the construction details for the Offload Pad? It is suggested that a concrete apron or an impervious material underlay this area.

ECA Response: The offload pad is constructed of 6" thick sloped concrete slab underlain with a 6" thick bed of crushed rock. The sloped area collects into a sump with a grated top that allows any fluids to be pumped out. Cross sections of the pad construction are shown in drawing A15-S-1, Sections 1 and 2.

A15-M-3 – Pump/Filter Pad Layout: What are the construction details for the Pump/Filter Pad? It is suggested that a concrete apron or an impervious material underlay this area.

ECA Response: The pump / filter pad is constructed of 6" thick sloped concrete slab underlain with a 6" thick bed of crushed rock. The sloped area collects into a sump with a grated top that allows any fluids to be pumped out. Cross sections of the pad construction are shown in drawing A15-S-1, Section 3.

A-15-S-1 – Structural Sections and Details: Are these details for the "Offload Pad"?

ECA Response: Yes. Sections 1 and 2 are through the offload pad. Section 3 is through the pump / filter pad. A single concrete apron was constructed to accommodate the complete pipe header.



NP-A15-P-1 – Fire Access: Rule 908.b.(5).D. Centralized facilities shall have a fire lane of at least ten (10) feet in width around the active treatment areas and within the perimeter fence. In addition, a buffer zone of at least ten (10) feet shall be maintained within the perimeter fire lane. The drawing referenced for the fire access around the pit does not show the required ten (10) foot fire lane around the pit. Please clarify.

ECA Response: A sundry has been submitted to request a variance to this Rule. Please see Document ID: 400926217

Appendix 9: NPR Vicinity Map

COGCC Comment: None.

Appendix 10: Stormwater Management Plan

COGCC Comment: The stormwater management plan should be site specific.

ECA Response: The North Parachute Ranch Area Stormwater Plan (Form 28 Appendix 10) details the best management practices that are used to construct all well pads in the North Parachute Ranch area (Appendix E: Stormwater Manual of Best Management Practices (BMPs), Figures SI-2, SP-0, SP-2, D-2 and D-3). The run-on diversion ditch, rip-rap and other site specific, as-built grading for the A15 pad is shown on Drawing No. 18975-520-SIT-32202 (Form 28 Appendix 8). There is minimal run-off from the pad as the vast majority of the surface area is covered by the pit. The small volume of run-off that does exist flows to the south of the pad and is intercepted by the roadside ditch adjacent to the “existing access drive” (see NPR SWMP BMP Figure D-2: “Access Road Intersection Well Pad Above Road”).

Appendix 11: Monitor Well Drilling Logs

COGCC Comment: See previous comments regarding the boring advancement and monitoring well construction.

ECA Response: The monitoring wells were drilled and installed as part of our comprehensive North Parachute Ranch water quality monitoring system.

Appendix 12: SPCC Plan.

COGCC Comment: See previous comments regarding current contact information, Rules and Regulation changes.



ECA Response: Encana updates our SPCC Plan at scheduled intervals as required by the EPA. Details of the Plan Maintenance program are set out in Section 7.1 of the SPCC Plan, which is located in Appendix 12 of the Form 28.

Appendix 13: Standard Operating Procedure

COGCC Comment: Submit a copy of Encana's flowline testing procedures for the pipelines associated with this facility. Submit a map of Encana's existing and proposed pipelines associated with this facility and update in the annual report. Include GIS shape files for incorporation into our GIS system. This pipeline information is for internal COGCC use only and is not visible to the public.

ECA Response: Pipelines are pressure tested to a maximum allowable operating pressure (MAOP) in accordance with COGCC Rule 1101.e.(1) and ASME standards prior to being put into initial service. A MAOP Calculation Record and Pressure Test Record are completed and kept on file by Encana. After the pipeline is put into service it is entered into our Pipeline Integrity Quality Management Program which includes valve maintenance, pressure relief maintenance, a damage protection program, lead survey and patrol criteria, line markers and signage control and continuing surveillance program. The surveillance program includes a field-wide pressure transmitter network that feeds into our real-time, monitored SCADA system.

Records of our pipeline alignments and right-of-ways are available from Garfield County, who are the regulatory authority for pipelines in the West Fork area where the A15 pit is located. The pipelines serving the pit run adjacent to the roadway along West Fork to connect into Encana's Middle Fork Water Facility. Encana does not believe that a GIS file of this segment of pipe will be useful in compiling information about our water pipeline network and would prefer to discuss the request for GIS information with the COGCC independent of this Form 28 application.

Appendix 14: Water Quality Data Set

COGCC Comment: None.

Appendix 15: Site Safety Evacuation Plan

COGCC Comment: Contact information provided should be updated when changes have been made.

ECA Response: Encana makes internal updates to our emergency response documents on a regular basis as contact information changes.



Appendix 16: Emergency Response Plan

COGCC Comment: Contact information provided should be updated when changes have been made.

ECA Response: Encana makes internal updates to our emergency response documents on a regular basis as contact information changes.

Appendix 17: Financial Assurance:

COGCC Comment: See previous comments on Financial Assurance.

ECA Response: Encana will amend our financial assurance once the third party review is completed and the bond value has been agreed with the COGCC.

Appendix 18: Closure and Reclamation Plan

COGCC Comment: None.

Appendix 19: Garfield County Permit Resolution

COGCC Comment: None.