

March 26, 2025

0320-4100-32640-02

Hugo A. Martinez MSc. P.Eng. PE.  
Manager, Reservoir Engineering  
Pacific Canbriam Energy Limited  
Suite 2100, 215 – 2<sup>nd</sup> Street SW  
Calgary, AB T2P 1M4

Dear Mr. Martinez:

**RE: PRODUCED WATER DISPOSAL SPECIAL PROJECT APPROVAL AMENDMENT #2  
PACIFIC CANBRIAM HZ ALTAIRES d-76-H/94-B-8 (WA #31916)  
ALTAIRES FIELD – BALDONNEL FORMATION**

The Regulator has reviewed the application submitted by Pacific Canbriam Energy Limited (PCE), dated February 3<sup>rd</sup>, 2025, requesting approval for disposal of produced water into the Altares field Baldonnell formation via a newly drilled lateral section of the subject well.

The subject well was purpose-drilled for disposal into the Baldonnell and Charlie Lake formations in 2017. Following testing, the Baldonnell was chosen as the disposal formation and was approved for disposal on November 29, 2017. The well began disposal operations in May 2018 and continued until May 2022, with a cumulative disposal volume of 319.5e<sup>3</sup>m<sup>3</sup>. The zone was suspended in January 2023 and abandoned in September 2024.

To enable disposal into a new region of the Baldonnell, a new 4,000mMD lateral was drilled in October 2024, with only the final 602m completed with a slotted liner. The completed portion of the well is approximately 2.1 km southwest of the original completion. Pressure tests and PCE seismic data indicate this region of the Baldonnell is isolated from the previous disposal reservoir by natural lineaments in the formation.

Attached please find **Order 17-02-015 Amendment #2**, designating an area in the Altares field, Baldonnell formation, as a Special Project under section 75 of the Energy Resource Activities Act, for the operation and use of a storage reservoir for the injection of produced water. This Order includes a number of detailed operational, measurement and reporting conditions. Disposal wells are subject to regular field inspection and audit. Contravention of a condition of this Order may be subject to enforcement under section 62 of ERAA, or suspension or cancellation of the Order under section 75(2)(b).

Condition 2h) requires an early reservoir pressure test to confirm adequate dissipation of disposal fluids and seismic monitoring conditions 2j) to l) have changed to include reporting events at the time of occurrence. Additionally condition 2p) requires the submission of a map of microseismic events to provide information on whether injected fluid remains bounded by the natural lineaments. The permit holder shall also report on any anomalous casing pressure readings in nearby Montney wells. Disposal of fluid with high total dissolved solids content requires adjustment of the wellhead injection pressure to remain below formation fracture pressure. It is the responsibility of the permit holder adjust wellhead injection pressure.

Should you have any questions, please contact Logan Gray at (250) 419-4465 or the undersigned at (250) 419-4430.

Sincerely,



Michelle Gaucher P.Eng.  
Supervisor, Reservoir Engineering  
BC Energy Regulator

Attachments



IN THE MATTER of the application from Pacific Canbriam Energy Limited, dated February 4<sup>th</sup>, 2025, requesting amendment to the disposal approval:

**ORDER 17-02-015 Amendment #2**

1. Under Section 75(1)(d) of the Energy Resource Activities Act, the Regulator designates the operation and use of a storage reservoir for produced water, including flowback from fracturing operations, in the Altares Field – Baldonnel formation as a special project in the following area:

NTS 94-B-08 Block H Units 57 & 67

2. Under section 75(2) of the Energy Resource Activities Act, the special project designation in this Order is subject to the following conditions. The Permit Holder shall:
  - a) Inject water into the well Pacific Canbriam HZ Altares d-76-H/94-B-8; WA# 31916 Baldonnel formation from 3,396.9 – 4,000.0 mKB MD.
  - b) Not exceed an injection pressure, measured at the wellhead on the subject well, of 8,725 kPag or the pressure required to fracture the formation, whichever is lesser.
  - c) Inject only through tubing with a packer set as near as is practical above the injection interval.
  - d) Continually measure and record the wellhead casing and tubing pressures electronically.
  - e) Alarm the casing-tubing annulus pressure monitoring system to indicate when casing pressure varies outside the normal operating range.
  - f) Cease injection and notify the Regulator at Reservoir@bc-er.ca immediately if there are any indications that hydraulic isolation is lost in the wellbore or formation.
  - g) Conduct and submit an annual Surface Casing Vent Flow test to the Regulator within 30 days of the completion of the test.
  - h) Conduct a reservoir pressure test on the formation in the subject well, with a shut-in period of sufficient length to provide data for calculation of the reservoir pressure
    - i. within 6 months of initial disposal, or after 50,000 m<sup>3</sup> of disposal, whichever comes first, and
    - ii. annually, thereafterand submit a report of the test within 60 days of the end of the test.
  - i) Cease injection upon reaching a maximum formation pressure of 19,225 kPaa, measured at 1,642.5 mKB TVD.
  - j) Continually observe and record seismic events within a 5 km radius of the well Canbriam Hz Altares d-76-H/94-B-8; WA #31916, using a monitoring program that:
    - i. is capable of real-time monitoring,
    - ii. has a magnitude detection of 1.5Mw and greater,
    - iii. has hypocenter accuracy to within ±500 meters
  - k) Before commencing disposal operations, install and fully activate an accelerometer within 1 km of the wellsite able to record three components of ground acceleration with a minimum detectability of 0.005g and a dynamic range of +/- 2g.

- l) Submit a report listing event coordinates (latitude, longitude and depth), event time, date, magnitude and include a detailed map of all events of magnitude 1.5 ML or greater attributed to this disposal well, to the Regulator via email ([reservoir@bc-er.ca](mailto:reservoir@bc-er.ca))
  - i) following events of magnitude 2.0 ML or greater, within 24 hours of the event, and
  - ii) annually, by February 1<sup>st</sup> of each year, including a catalogue of all events of 1.5 ML or greater that occurred in the previous calendar year.
- m) Perform a casing inspection log on the subject well and submit results to the Regulator within 30 days of the completion of logging, at an interval of not more than every 10 years, commencing from the date of initial disposal.
- n) Perform a hydraulic isolation temperature log on the subject well and submit results to the Regulator within 30 days of the completion of logging, at an interval of not more than every 5 years, commencing from the date of initial disposal.
- o) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Regulator approval.
- p) At the conclusion of 3 months of disposal operation of the well, and upon request, provide a map of microseismic events attributed to this well that occurred since the start of operation.



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Michelle Gaucher, P.Eng.  
Supervisor, Reservoir Engineering  
BC Energy Regulator

DATED AT the City of Victoria, in the Province of British Columbia, this 26<sup>th</sup> day of March 2025.



### **Advisory Guidance for Order 17-02-015 Amendment #2**

- I. A production packer must be set above the injection interval and the space between the tubing and casing filled with corrosion and frost inhibiting fluids, as per section 16(2) of the Drilling and Production Regulation.
- II. Annual packer isolation tests are required to be conducted and the associated report must be submitted to the Regulator within 30 days of test completion, as per section 16(3) of the Drilling and Production Regulation.
- III. Injected fluids must be metered and the injection pressure measured at the wellhead, as per section 74 of the Drilling and Production Regulation.
- IV. A monthly disposal statement including the volume of disposal fluid, maximum wellhead injection pressure, and total operating hours must be submitted to the Regulator via Petrinex not later than the 20<sup>th</sup> day of the month following the reported month, as per section 75 of the Drilling and Production Regulation.
- V. Seismic events must be reported and disposal operations suspended as per section 21.1 of the Drilling and Production Regulation.