



March 5, 2018

8100-2800-32640-02

Scott Hagen  
Tervita Corporation  
1600, 140 – 10<sup>th</sup> Avenue SE  
Calgary, AB T2G 0R1

Dear Mr. Hagen,

**RE: NON-HAZARDOUS WASTE AND PRODUCED WATER DISPOSAL  
SPECIAL PROJECT; AMENDMENT #2  
TERVITA HZ W STODDART A10-30-87-20 W6M; WA# 28116  
CADOMIN FORMATION**

Approval for disposal of non-hazardous waste and produced water, Order 12-02-023, was issued for the subject well, Cadomin formation, on November 5, 2012. On July 21, 2015, Order 12-02-023 Amendment #1 was issued to amend the approval to current disposal well standards. On January 26, 2018, Tervita submitted a letter requesting to increase the maximum wellhead injection pressure (MWHIP) from 14,800 kPa to 18,150 kPa.

The subject well has had poor injection performance since early in its life due to the horizontal leg displaying limited effective connectivity. In August 2017, Tervita completed the nearby well WA 10864 (Tervita Hz W Stoddart 10-30-87-20) in the Cadomin zone and performed some testing. Data from this testing and other nearby Cadomin wells indicates that the fracture gradient in the reservoir is higher than was previously utilized in the MWHIP calculation for WA 28116. The MWHIP of 18,150 kPa has been determined to be appropriate for the subject well.

Attached please find **Order 12-02-023 Amendment #2** designating an area near the Stoddart West field – in the Cadomin formation as a Special Project under section 75 of the *Oil and Gas Activities Act*, for the use of a storage reservoir for the disposal of non-hazardous waste and produced water. Changes from Order 12-02-023 Amendment #1 include condition 2c), which alters the MWHIP, as well as condition 2k)ii), which requires the performance of a hydraulic isolation log within 3 months of resuming disposal into the subject well at the increased MWHIP.

The Ministry of Environment identifies the type of effluent approved for injection in the separate Waste Discharge Permit, granted under the Environmental Management Act.

In certain circumstances, disposal well operation may induce seismicity of values that require modification of operations to mitigate.

Disposal of fluid with high total dissolved solids content requires adjustment of the wellhead injection pressure to remain below formation fracture pressure

Should you have any questions, please contact Ron Stefik at (250) 419-4430 or Michelle Harding at (250) 419-4493.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ron Stefik', written over a horizontal line.

Ron Stefik, Eng.L.  
Supervisor, Reservoir Engineering  
Oil and Gas Commission

Attachment



## ORDER 12-02-023 Amendment #2

1. Under Section 75(1)(d) of the *Oil and Gas Activities Act*, the Oil and Gas Commission (Commission) designates the operation and use of a storage reservoir for the disposal of produced water, including flowback from fracturing operations, and non-hazardous waste into the Cadomin formation – near the Stoddart West field as a special project in the following area:

DLS Twp 87 Rge 20 W6M Section 30 - Lsds 3, 4, 5, 6, 9, 10, 11, 12, 13, 14, 15 and 16

2. Under section 75(2) of the *Oil and Gas Activities Act*, the special project designation in this Order is subject to the following conditions. The Permit Holder shall:
  - a) Inject produced water and non-hazardous waste only into the well Tervita Hz W Stoddart A10-30-87-20W6M; WA# 28116 Cadomin formation (open hole from 1330.0 to 2234.0 mKB MD).
  - b) Hold a valid Permit under the Environmental Management Act for the disposal of non-hazardous waste.
  - c) Not exceed an injection pressure, measured at the wellhead on the subject well, of 18,150 kPag or the pressure required to fracture the formation, whichever is lesser.
  - d) Inject only through tubing with a packer set as near as is practical above the injection interval.
  - e) Continually measure and record the wellhead casing and tubing pressures electronically.
  - f) Cease injection and notify the Commission immediately if hydraulic isolation is lost in the wellbore or formation.
  - g) Submit the annual packer isolation test report to the Commission within 30 days of the completion of the test.
  - h) Include the disposal operating hours and the maximum injection pressure value on the monthly disposal statement.
  - i) Cease injection upon reaching a maximum formation pressure of 13,500 kPaa, measured at 1236.8 mKB TVD.
  - j) Conduct an annual 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, and submit a report of the test within 60 days of the end of the test.
  - k) i) Perform a casing inspection log on the subject well and submit results to the Commission 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.  
ii) Perform a hydraulic isolation temperature log on the subject well within 3 months of resuming disposal under this Order, and submit results to the Commission within 30 days of the completion of logging. Thereafter, perform a hydraulic isolation temperature log at an interval of not more than every 5 years.
  - l) Not conduct a hydraulic fracture stimulation on any formation in the subject well without prior Commission approval

A handwritten signature in black ink, appearing to read 'Ron Stefik', written over a horizontal line.

Ron Stefik, Eng.L.  
Supervisor, Reservoir Engineering  
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 5<sup>th</sup> day of March 2018.

## Advisory Guidance for Order 12-02-023 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 submitted, 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 must be submitted to the Commission not later than the 25<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.