

12-02-011

3200-7400-32640-02



April 26, 2012

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Lori O'Brien  
Planning and Development Advisor  
Tervita Corporation  
500, 140 – 10 Avenue SE  
Calgary AB T2G 0R1

Dear Ms. O'Brien:

**RE: NON-HAZARDOUS WASTE & SALT WATER DISPOSAL SPECIAL PROJECT  
TERVITA CLARKE b-A78-G/94-J-10; WA# 28012  
DEBOLT FORMATION**

Oil and Gas Commission (Commission) staff have reviewed the application, dated February 27, 2012, requesting approval to dispose of produced water and non-hazardous waste into the Debolt formation of the subject well. A step rate injectivity test, approved January 11, 2012, has been performed on this well.

Attached please find Order 12-02-011, designating an area in the Clarke field – Debolt formation a Special Project under section 75 of the Oil and Gas Activities Act, for use of a storage reservoir for the disposal of produced water and non-hazardous waste generated from oil and gas operations.

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

Operation of the disposal project will be subject to periodic review and the Commission may modify the Order, if deemed appropriate.

Should you have any questions, please contact Curtis Kitchen at (250) 419-4443 or Ron Stefik at (250) 419-4430.

Sincerely,



Paul Jenkins  
Commissioner & CEO  
Oil and Gas Commission

Attachment


IN THE MATTER of the application from Tervita Corporation, to the Oil and Gas Commission (Commission) dated February 27, 2012 for the operation and use of a storage reservoir.

**ORDER 12-02-011**

- 1 Under Section 75(1)(d) of the *Oil and Gas Activities Act*, the Commission designates the operation and use of a storage reservoir for the disposal of produced salt water and non-hazardous waste fluids generated from oil and gas operations, into the Clarke Lake area – Debolt formation as a special project in the following area:

NTS 94-J-10 Block G Unit 78

- 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:
- a) Produced salt water and non-hazardous waste shall be injected only into the Debolt formation through the well Tervita Clarke b-A78-G/94-J-10 (Well Permit # 28012).
  - b) The disposal/injection pressure at the wellhead must not exceed 7,100 kPa.
  - c) A record of volume disposed of through this well must be included on a Monthly Injection/Disposal Statement, in the prescribed form (BC-S18), which must be submitted to the Oil and Gas Commission not later than the 25<sup>th</sup> day of the month following the reported month.
  - d) The non-hazardous waste disposal must be in accordance with the approval conditions of a Waste Discharge Permit, issued by the Ministry of Environment.
  - e) A BC11 form must be submitted to the Ministry of Finance following commencement of operations to update well status.

  
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Paul Jenkins  
Commissioner & CEO  
Oil and Gas Commission

DATED AT the City of Victoria, in the Province of British Columbia, this 26<sup>th</sup> day of April 2012.

## RATIONALE FOR ORDER

I have made **Order 12-02-011** after having considered:

- **Injectivity Performance** – An injectivity test was performed on January 31, 2012 that showed a fracture breakdown pressure at surface of 8.65 MPa at 21 m<sup>3</sup>/hr (504 m<sup>3</sup>/d). The fracture gradient was determined to be 21.8 kPa/m.
- **Max Operating Wellhead Pressure** – The calculations and values below were used to calculate the Maximum Allowable Wellhead Pressure.
  - Breakdown pressure at surface = 8650 kPa
  - Salt Water Gradient = 10.5 kPa/m
  - Safety Factor = 10%
  - TVD to MPP = 732m
  - Tubing friction loss = 100 kPa
  - Max WH Pressure =  $((8650 + (10.5 \times 732)) \times 0.9) - (10.5 \times 732) + 100 = 7116$  kPa
  - For Simplicity, **Maximum Allowable Wellhead Pressure = 7100 kPa**
- **Reservoir Containment** – The Debolt formation is directly overlain by a thin 2 meter thick Detrital Shale, which is overlain by 13 meters of tight siltstone/shale of the Nordegg/Baldonnell formation, which is overlain by ~55 meters of shale. The Debolt is bound below by the Shunda formation which is composed of tight limestone. A cement bond log analyses reports good bond throughout well, cement to surface. Temperature logging during injection indicates fluids only entering Debolt formation.
- **Resource Conservation** – There are no hydrocarbon reserves put at risk by the operation of this facility.
- **Need for Disposal Well** – Tervita Corporation operates treatment/recovery/disposal facilities. Well b-A78-G/94-J-10 will provide local disposal capacity, supporting development and production in the Clarke Lake/Horn River area.
- **Objections** – No objections have been received over the 21 day public notice period.
- **Disposal Permit** – The Ministry of Environment identifies the type of effluent approved for injection in the separate Waste Discharge Permit, granted under the Environmental Management Act.

Prepared by Curtis Kitchen, EIT

  
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Paul Jenkins  
Commissioner & CEO  
Oil and Gas Commission

April 26, 2012