



Manitoba Science, Technology, Energy and Mines  
Box 1359, 227 King St. West  
Virden, MB ROM 2CO  
Phone (204) 748-4260  
Fax (204) 748-2208

October 29, 2013

Attn Allan Gervin:

RE: Tank Battery Application for Manson 14-10-13-28 W1M

Tundra Oil & Gas Partnership would like to change our temporary battery operating permit at location 14-10-13-28 W1M to a permanent Battery. Tundra will comply with all the regulations set out by the Manitoba Science, Technology, Energy and Mines. Please review the following application.

75 (1) Battery original startup date was start-up was March/2013.

- a) A cheque for \$1000 is attached.
- b) Tundra Oil & Gas Partnership has been operating in the province for 33 years and should be in good standing with the government. Therefore, there should not be a requirement for a performance deposit.
- c) Two copies of the survey plan of the battery location are attached.
  - c.1) The names and addresses of all landowners and occupants within 1.5km of the proposed site are shown in an attached document. A sample consultation letter is also attached. A summary of the consultations will be submitted upon completion.

d) The wells that will be tied into the battery are as follows:

- 11-10-13-28 vertical
- 11-10/10-9-13-28 horizontal
- 14-10/15-9-13-28 horizontal
- 11-10/11-11-13-28 horizontal

e) An estimate of the production rates for oil, water and gas are as follows:

Estimated Oil Production	Estimated Water Production	Estimated Gas Production
30m <sup>3</sup> /day	15m <sup>3</sup> /day	12m <sup>3</sup> /day



It is anticipated that this battery will be classified as a Class 1 Battery due to the volume of oil that is expected to be produced. Tundra Oil & Gas tried to use separators with gas runs in order to obtain an accurate GOR of the wells in this field but was unable to do so, because of the extreme low GOR in this field. The Estimate GOR for this field is 1:0.4.

An estimate of the allocation of the gas volumes are as follows:

Used for fuel	Flared	Vented
0%	0%	100%

- e.1) A copy of the representative gas analysis from wells in the area are attached. This test shows that the wells in the area have 78.3 PPM H<sub>2</sub>S. Also noted that the gas is 82% Nitrogen.

f) The specifications of the process vessels to be used are as follows:

Equipment	Dimensions	Min. Flow	Max Flow	AOP	AOT
5-Steel Welded Oil tanks	400 bbl each		50m <sup>3</sup>		

- g) Well testing will be done at the battery site. Each well will be tested for a minimum 24 hour period at least once every three months, in order to comply with well testing regulations. Each well will be run into its on tank and gauged.
  - g.1) At this time Tundra proposes to continue venting the tanks.
  - g.2)
    - i) Gas is being vented due to the low volume of gas. The gas itself will not burn due to the high concentration of nitrogen and would require a constant pilot flare to burn the gas. The pilot flare would consume 8 – 10 m<sup>3</sup>/d of gas.
    - ii) Nothing can be done at this time.
    - iii) The low volume of gas and the low % of H<sub>2</sub>S should minimize any other issues.
  - g.3) A copy of the Screen 3 air dispersion modeling is attached. The worst case scenario is the dispersion model with all the gas venting from 1 of the 5 tanks. The modeling showed that the H<sub>2</sub>S is at an acceptable level: 0.03732μg/m<sup>3</sup> x 0.706=0.026 parts per billion (acceptable level is 11.0 parts per billion).
- h) Two copies of a preliminary plot drawing showing the location of each tank are attached.



- i) Two copies of the process flow schematic are attached.
- j) Repealed
- k) Trucked to other facilities.
- l) We anticipate that the Petroleum Branch will be requesting additional information which can be submitted as an addendum to this application.

If you have any additional questions, comments, or concerns please contact Jade Cable in the Virden office at (204)748-4441.

Sincerely,

A handwritten signature in black ink, appearing to read "Jade Cable", is written over a horizontal line.

Jade Cable, C.E.T.  
Facilities and Construction Manager