



# ERCO Worldwide

A division of Superior Plus LP

April 13, 2018

Client File Number 4563.00

Jennifer Winsor, P.Eng  
Environmental Engineer, Environmental Approvals  
Manitoba Sustainable Development

Dear Ms. Winsor,

**Re: ERCO New Salt Supply Well, Environmental Act Licence No. 2495 R5**

The intent of this letter is to notify you of an alteration at our facility to develop a new salt supply well for the ERCO Worldwide, Hargrave facility.

ERCO obtains brine feed stock by solution mining mineral salt from deposits at the Hargrave facility. The existing production wells were drilled in 2001 and 2005 are licensed under the Manitoba Oil & Gas Act (Well License #4947 and 5698).

In July 2015, a sonar study determined that the end of life for the existing cavern is near. The ratio between the height and the width of the cavern is approaching the ratio (2:1) where if exceeded, the cavern roof could collapse and stop production at the site.

The ERCO Hargrave facility would like to undertake the conversion of well 3D-12-11-27W1M to a salt producing well to meet the production requirements. Please find attached, the following and advise your decision on this request at your earliest convenience:

1. Completed Notice of Alteration (NoA) Form
2. NoA Report
3. NoA fee of \$500 (Cheque # 002236)

Should you have any questions or comments, please contact me at (204) 748-4301.

Yours sincerely,



Ken Balfour  
Plant Manager

cc: Tracey Braun, Manitoba Sustainable Development  
Peter Crocker, Manitoba Sustainable Development  
Rena Nayar, Manitoba Sustainable Development  
Dustin Willitts, ERCO Worldwide

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## Notice of Alteration Report

ERCO Worldwide intends to undertake the conversion of a disposal well to a salt producing well at the Hargrave facility. This report describes the alteration in more details.

### Description of the Alteration

The alteration includes converting the existing disposal which includes piping modifications down hole and above ground and development of a salt production cavern. The following are the major milestones of the alteration:

1. Rig in a Service rig
2. Conversion of disposal well (Licence no.4948) to production well (to be licensed separately under the Manitoba Oil and Gas Act)
3. Construction of associated infrastructure
  - Pipelines
  - Well-shack construction
4. Development of salt cavern
5. Commissioning and Operation of production well

Following sections will describe these milestones in detail.

#### *Rig in a service rig:*

The coordinates for the existing disposal well are as follows:

- Disposal well coordinates 103.03-12-011-27W1.00

Since the existing disposal well is located within the facility boundaries, no additional topsoil disturbance is expected.



Figure 1 Disposal Well Location

*Conversion of the existing Disposal Well:*

The following steps will be taken to convert the existing disposal well to a production well

- Pressure test BOP
- Strip wellhead, unset packer and install BOP
- Circulate hole over until fresh water is at surface
- Pull the 73mm tubing including packer and lay down on surface
- Rig in wire line
- Set a bridge plug at 1208MKB and dump bail 8m of cement (0.163m<sup>3</sup>) (new plug back total depth is 1200MKB)
- Pressure test bridge plug 7000KPA (Board witnessed test)
- Take off the BOP
- Remove existing well head and install 114mm well head and pressure test
- Start service rig equipment operations, install BOP and pressure test
- Rig in perforators, log and perforate 1132-1179MKB
- 25 gram charges, 20 shots/meter in 101.6 disposable carrier (8 runs)
- Correlate depth with GAMP log and collar log
- Move the 73mm tubing off the rack and load rack with 114mm tubing
- Change out BOP rams to 114mm tubing
- Run 114mm tubing to 1178 KMB
- Land in dog nut
- Install well head
- Rig out and release rig

*Construction of associated infrastructure:*

- 100mm Carbon steel pipelines will be laid and connected to the process area
- A sump measuring 1.2x1.2x1.2m will be constructed
- A shack constructed of corrugated metal sheet and partial concrete walls (5x5m)

*Development of Salt Cavern:*

The new cavern will be developed in the Prairie Evaporite salt formation. The top of salt formation is approximately 1132 m below ground level. The cavern will be a single entry completion, with one hanging string. Production casing is already in the Prairie Evaporite formation and will be cemented into place to protect from any oil and gas formations.

This cementing of the production casing also serves as a second seal for any near surface groundwater aquifers as the well extends through these aquifers.

Once the well is converted per regulatory requirements, treated water and recycle streams will be injected into the formation at a rate of approximately 12m<sup>3</sup>/hr. The target well production rate will be 9m<sup>3</sup>/hr of saturated brine. The plant will continue to operate from the existing cavern until the new cavern is developed.

*Commissioning and Operation of Production well:*

Once the production well is developed, it will be commissioned and connected to the main process. The target production rate is 9m<sup>3</sup>/hr. Since the target production rate of the new well is the same as the existing production well, no new waste streams are estimated to be generated as a result. In addition, due to closed loop piping, there are no air emissions associated with the alteration.

**Conclusion**

In summary, there are no significant environmental impacts as a result of this alteration. Table 1 summarizes potential impacts and associated mitigation measures.

**Table 1 Summary of Environmental Impacts due to the Proposed Alteration**

<b>Alteration Milestone</b>	<b>Environmental Aspect</b>	<b>Environmental Impact</b>	<b>Mitigation Measures</b>
Service Rig Work	Soil disturbance	No immediate environmental impact as disposal well already exists	Not applicable
	Metal waste	Positive impact due to recycling	Any metal waste during the construction phase will be recycled
	Surface water bodies	There are no surface water bodies within the boundaries of the plant.	Surface water trapped within the service rig area will be pumped to the process area
	Inhibited fluid	No immediate environmental impact, inhibited fluid will be disposed of at a licensed waste disposal site	Any waste during this phase will be disposed of properly
Construction of associated infrastructure	Metal waste	Positive impact due to recycling	Any metal waste during the construction phase will be recycled
	Construction waste	No immediate environmental impact	All construction waste will be captured and diverted as appropriate
Development of salt cavern	Sulphate mud	No immediate environmental impact is expected during this phase	Sulphate mud will be captured using existing sulphate waste management infrastructure
	Air emissions	No air emissions are expected from this alteration	Not applicable
Commissioning and Operation of Production Well	Sulphate mud	No immediate environmental impact is expected during this phase	Sulphate mud will be captured using existing sulphate waste management infrastructure
	Air emissions	No air emissions are expected from this alteration	Not applicable