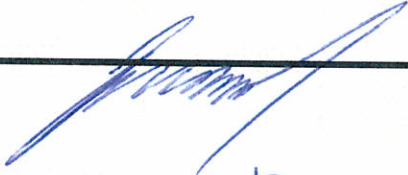


Notice of Alteration Form



Client File No. : 4563.00	Environment Act Licence No. : 2495RS
Legal name of the Licencee: ERCO WORLDWIDE	
Name of the development: ERCO WORLDWIDE - HARGRAVE FACILITY	
Category and Type of development per Classes of Development Regulation: MANUFACTURING <i>Manufacturing and Industrial Plants</i>	
Licencee Contact Person: Ken Balfour	
Mailing address of the Licencee: PO BOX 2410	
City: VIRDEN	Province: _____ Postal Code: R0M 2C0
Phone Number: 204 748 4304 Fax: _____	Email: KBALFOUR@eroworldwide.com
Name of proponent contact person for purposes of the environmental assessment (e.g. consultant): Same as ABOVE	
Phone: _____	Mailing address: _____
Fax: _____	
Email address: _____	
Description of Alteration (<i>max 90 characters</i>): 	
Alteration fee attached: Yes: <input checked="" type="checkbox"/> No: <input type="checkbox"/>	
If No, please explain: 	
Date: 08/12/2016	Signature: 
	Printed name: KEN BALFOUR
<p>A complete Notice of Alteration (NoA) consists of the following components:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Cover letter <input checked="" type="checkbox"/> Notice of Alteration Form <input checked="" type="checkbox"/> 4 hard copies and 1 electronic copy of the NOA detailed report (see "Information Bulletin - Alteration to Developments with Environment Act Licences") <input checked="" type="checkbox"/> \$500 Application fee, if applicable (Cheque, payable to the Minister of Finance) 	
<p>Submit the complete NOA to:</p> <p>Director Environmental Approvals Branch Manitoba Sustainable Development Suite 160, 123 Main Street Winnipeg, Manitoba R3C 1A5</p> <p>For more information:</p> <p>Phone: (204) 945-8321 Fax: (204) 945-5229 http://www.gov.mb.ca/conservation/eal</p>	

December 08, 2016

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).

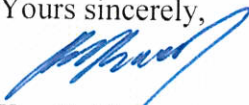
In July 2015, a sonar study determined that the end of life for the existing cavern is approaching. The ratio between the height and the width of the cavern is approaching the ratio (2:1) where if exceeded, the cavern roof could collapse and stop production at the site.

The ERCO Hargrave facility would like undertake the drilling and development of the cavern 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 # 002148)

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

Yours sincerely,



Ken Balfour
Plant Manager
Encl

cc: Tracey Braun, Manitoba Sustainable Development
Peter Crocker, Manitoba Sustainable Development

Engineering • Research • Commitment • Optimization



Rena Nayar, Manitoba Sustainable Development
Dustin Willitts, ERCO Worldwide
Emily Fattore, ERCO Worldwide
Prashant Rajurkar, ERCO Worldwide

Notice of Alteration Report

ERCO Worldwide intends to undertake the drilling and development of a new salt cavern at the Hargrave facility. This report describes the alteration in more details.

Description of the Alteration

The alteration includes drilling of a new well, development of the salt production cavern and associated connections with the main process building. Following are the major milestones of the alteration:

1. Drill Pad preparation for drilling the new production well
2. Drilling of new 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.

Drill Pad Preparation:

The drill pad will be 29 x 37m and located east of the facility. The coordinates for drilling pad and production well are as follows:

- Drilling pad coordinates 49°54'11.067", 101°02'43.860" (NAD83)
- Production well coordinates 49°54'09.670", 101°02'38.594" (NAD83)

Since the drill pad is located within the facility boundaries, no additional topsoil disturbance is expected. Disturbed soils will be used to create a compacted berm around the drill pad. This berm will act as containment during the drilling process.

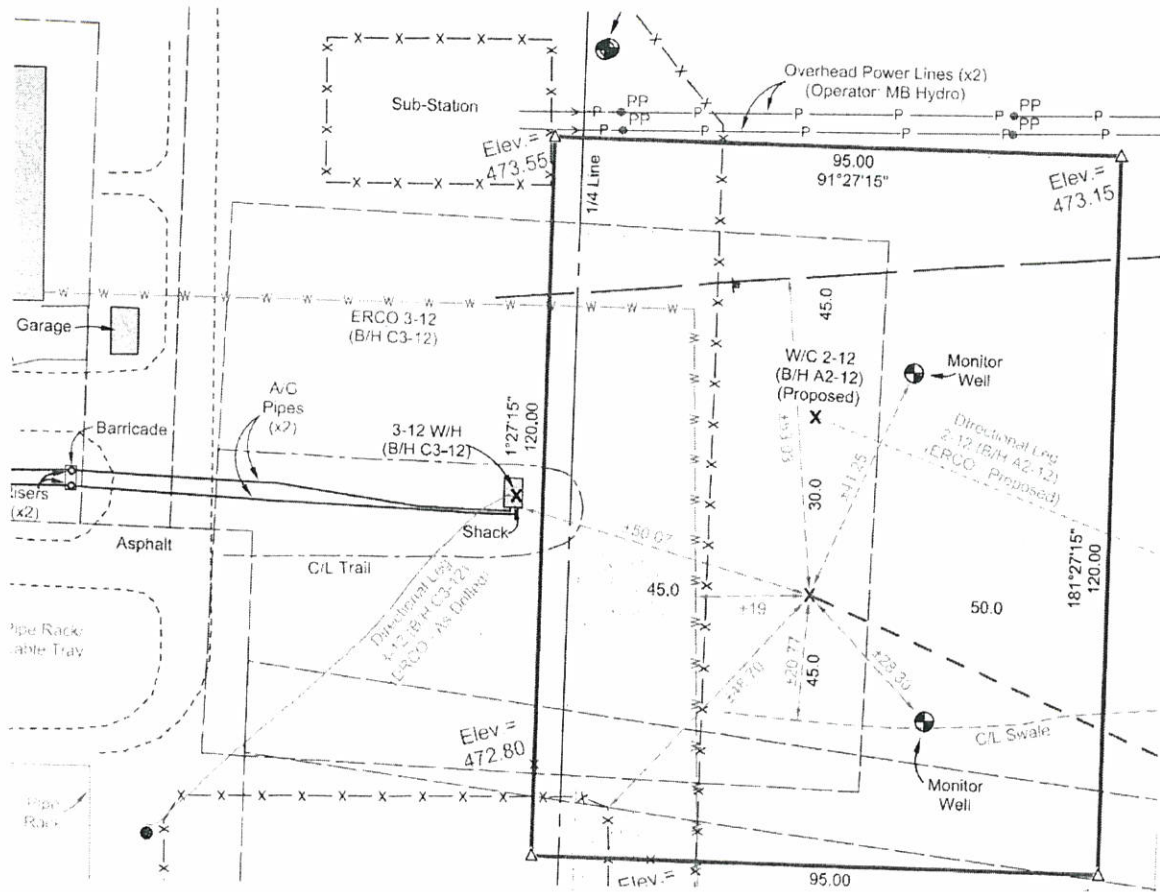


Figure 1 Drill Pad Layout

Drilling of the New Production Well:

A parallel licensing process is currently in progress with the Petroleum Branch to obtain associated approvals related to the drilling process. A drill rig will be assembled at the facility. During the drilling phase, the drilling company will have a water-based mud system for the surface hole which will be landspread once this hole section is completed. ERCO will be utilizing a salt based mud system for the rest of the well. The mud will be transported to and disposed at an approved disposal facility. All the associated permits related to landspreading and disposal of drill cuttings will be coordinated by the drilling consultant.

Construction of associated infrastructure:

Once the production well is drilled, the drilling rig will be dismantled and removed from the site. Following components will be installed at the production well:

- A concrete pad of 5 x 5m will be constructed around the production well (above grade)
- 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)
-

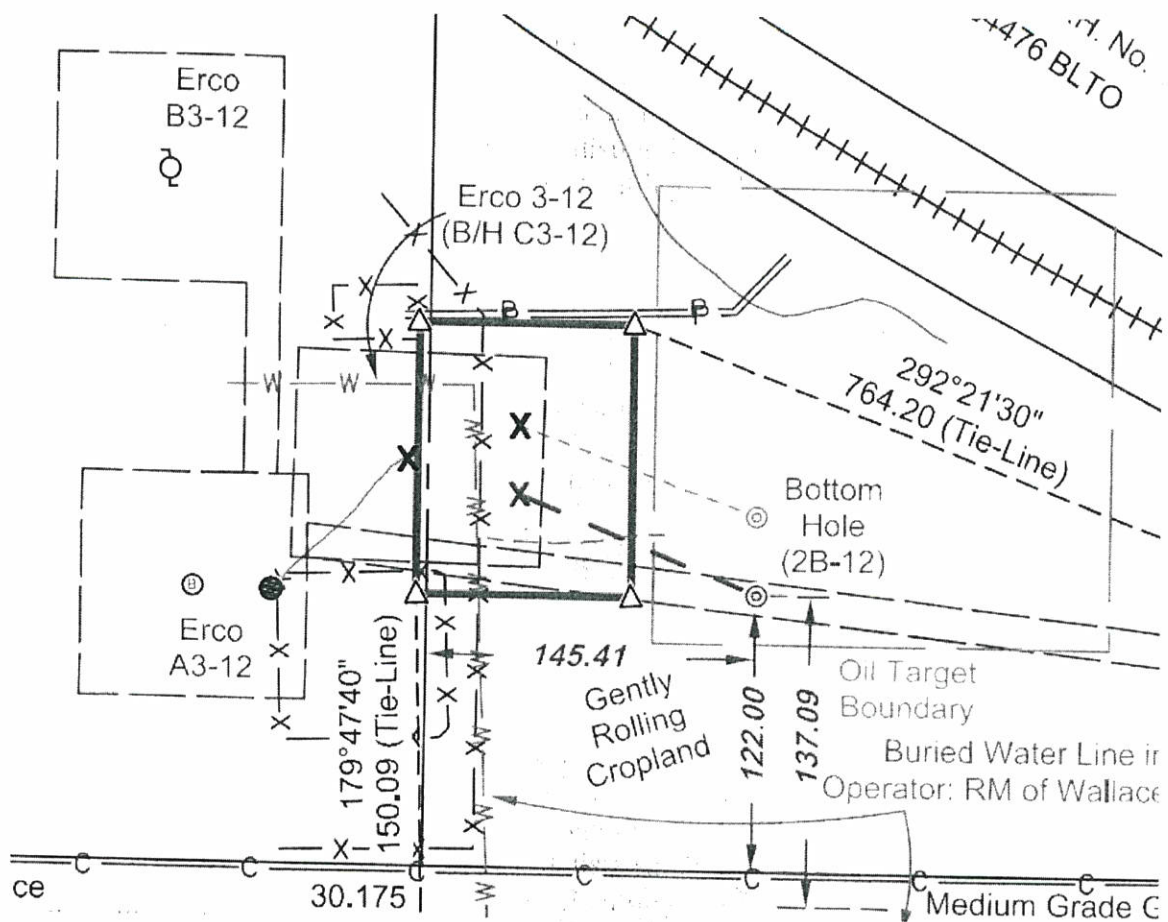


Figure 2 Layout of the Production Well Pad

Development of Salt Cavern:

The new cavern will be developed in the Prairie Evaporite salt formation. The top of salt formation is approximately 1120 m below ground level. The cavern will be a single entry completion, with two hanging strings. Production casing will be run inside the surface conductor casing and set 19 m into the Prairie Evaporite and 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 drilled per regulatory requirements, treated water and recycle streams will be injected into the formation at a rate of approximately 12m³/hr. The target well production rate will be 9m³/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 9m³/hr. Since the target production rate of the new well is 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 results of this alteration. Table 1 summarizes potential impacts and associated mitigation measures.

Table 1 Summary of Environmental Impacts due to the Proposed Alteration

Alteration Milestone	Environmental Aspect	Environmental Impact	Mitigation Measures
Drill Pad Preparation	Soil disturbance	Since the drill pad will be located within the existing facility, no new topsoil disturbance is expected	Use disturbed soil to create compacted berm around the drill pad to serve as containment
	Waste generation	No additional waste streams are estimated to be generated due to this activity	Not applicable
	Surface water bodies	There are no surface water bodies within the boundaries of the plant.	Surface water trapped within the drill pad will be either used in the drilling process or pumped to the process area The berm created around the drill pad will act as containment and hence no impact is expected to any surface water bodies.
	Erosion and siltation	No impact is expected in terms of erosion. Minimum siltation is expected due to drill pad construction	Not applicable
Drilling of new production well	Waste generation due to surface hole drill cuttings	No environmental impact is expected as the surface hole drill cuttings will be landspread	Surface hole drill cuttings will be landspread

	Wastes from salt based mud system	No environmental impact is expected as wastes from salt based mud system will be collected on site	Drill cuttings from salt based mud system will be collected and disposed at approved disposal facility
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 Air emissions	No immediate environmental impact is expected during this phase No air emissions are expected from this alteration	Sulphate mud will be captured using existing sulphate waste management infrastructure Not applicable
Commissioning and Operation of Production Well	Sulphate mud Air emissions	No immediate environmental impact is expected during this phase No air emissions are expected from this alteration	Sulphate mud will be captured using existing sulphate waste management infrastructure Not applicable