Notice of Alteration Form

Manitoba
Environment, Climate and Parks

File No. : 2022.20	Environment Act Licence No. : 2698R

Legal name of the Licencee: HUSKY OIL OPERATIONS LTD

Name of the development: MINNEDOSA ETHANOL PLANT

Category and Type of development per Classes of Development Regulation:

Manufacturing — Manufacturing and industrial plants

Licencee Contact Person: Tristram Tidd
Mailing address of the Licencee: 225 6 AVE SW
City: Calgary Province: Alberta Postal Code: T2P 0M5
Phone Number: (587) 774-7973 Fax: Email: tristram.tidd@cenovus.com

Name of proponent contact person for purposes of the environmental assessment (e.g. consultant):

Phone: Fax:	Mailing address:

Email address:

Short Description of Alteration *(max 90 characters):*

Removal of process chiller from ethanol plant and amendment of condition 26.

Alteration fee attached: Yes: ☐ No: ☑

If No, please explain: Alteration to equipment with no increase in environmental effects

Date: 2022-05-19	Signature: [redacted] Printed name: Tristram Tidd

A complete Notice of Alteration **(NoA)** consists of the following components:

- ☑ **Cover letter**
- ☑ **Notice of Alteration Form**
- ☑ **1 hard copy and 1 electronic copy of the NoA detailed report** (see "Information Bulletin - Alteration to Developments with Environment Act Licences")
- ☐ **$500 Application fee, if applicable** (Cheque, payable to the Minister of Finance)

Submit the complete NoA to:
Director, Environmental Approvals Branch
Manitoba Environment, Climate and Parks
1007 Century Street
Winnipeg, Manitoba R3H 0W4
EABDirector@gov.mb.ca

For more information:
Phone: (204) 945-8321 Fax: (204) 945-5229
https://www.gov.mb.ca/sd/permits_licenses_approvals/eal/licence/index.html

Note: Per Section 14(3) of the Environment Act, Major Notices of Alteration must be filed through submission of an Environment Act Proposal Form (see "Information Bulletin – Environment Act Proposal Report Guidelines")

Reset **Print**

Cover Letter and Notice of Alteration Assessment - Removal of Chiller Minnedosa Ethanol Plant Manitoba Conservation License No. 2698R

May 2022

cenovus ENERGY

SENT ELECTRONICALLY (EABDirector@gov.mb.ca)

Director, Environmental Approvals Branch
Manitoba Environment Climate and Parks
1007 Century Street
Winnipeg, MB R3H 0W4

Attn: Director

Re: Cenovus (formerly Husky Oil Operations Limited)
Minnedosa Ethanol Plant
Manitoba Conservation Licence No. 2698R
Proposed Alterations to Ethanol Plant – Chiller Removal

Introduction

Cenovus Energy Inc (Cenovus) acquired the Minnedosa Ethanol Plant from Husky Oil Operations Ltd in Q1 2021. Since that time a review of the plants process has been completed and a decision has been made to remove the chillier unit (CH-409). This letter report provides the necessary background information and rational to support a Notice of Alteration (NOA) to amend the existing approval to accommodate this process change. Cenovus is working with Manitoba Environment Climate and Parks to complete the transfer of approval 2698R from Husky Oil Operations Ltd.

Removal of the chiller will improve environmental outcomes and reduce operating costs. However, during plant shutdowns (3 times per year) the temperature of fluid entering the absorber will for a short time not be in compliance with license condition 26. Therefore, Cenovus requires an amendment to the license to allow for this process change to occur (see below).

A detailed explanation of the proposed alteration and license amendment request follows. Figure 1 provides a high-level summary of the existing and proposed processes. The proposed process flow diagram is presented in Attachment A.

With approval from Manitoba Environment Climate and Parks a pilot program to evaluate this process change has been completed. This pilot program confirmed that the process change will not result in a decrease in ethanol recovery and that ethanol recovery increases as the temperature of the condensate inlet temperature decreases.

Project Background

The Minnedosa ethanol plant (MEP) is located on several parcels of industrial zoned land in the Town of Minnedosa, Manitoba. The MEP began operation in 2005 and has undergone amendments in 2005, 2011, 2012 and 2016. The facility operates under Manitoba Energy Climate and Parks approval 2698R.

The absorber (T-406) is currently equipped with a process chiller (CH-409) to cool the processes condensate stream to the absorber at a temperature low enough to comply with the environmental license for MEP (12°C to 30°C). For economic and reliability reasons, we are proposing to decommission the chiller and use potable town water instead that is consistently at a temperature of about 8°C. The current chiller uses a 110 HP motor with high electricity usage in addition to high annual maintenance costs.

To achieve the cooling demonstrated by the chiller, potable town water at 8°C passes through the heat exchangers to cool the process flow for the absorber. The heated town water will then be pumped into the potable water source header for use in the Utilities building. By sending the heated town water to utilities, the system will require less natural gas to heat the reverse osmosis (RO) permeate water for use in the boiler (BR-1700).

The primary operating savings are associated with reduced electricity and natural gas consumption and elimination of the chiller maintenance costs. From an environmental outcome perspective, the process change will not result in increased water use or wastewater generation and there will be a reduction in green house gas emissions.

Project Description

Figure 1 provides a description of the new ethanol recovery process. The project scope includes the removal of the chiller (CH-409) and minor changes to process piping to (1) re-route the absorber effluent (T-406) directly to heat exchanger E-408 and (2) direct heated Town water from heat exchangers E-408 and E-418 to the Utilities building. No additional tankage or additional process modifications will be required. The new process flow diagrams are provided in Attachment A.

During plant shutdowns (approx. 3 times per year) the water demand approaches zero; however, for a short period of time (up to 48 hours) after shutdown the absorber is still operational, and water is required to ensure efficient CO_2 capture. During this time Cenovus is proposing to directly run Town water into the absorber at a rate of approximately 5.0m^3/h for up to 48 hours. This minimizes overall water use and wastewater generation. This additional wastewater generation (~500 m^3) offsets the increased capture of CO_2 during these shutdown periods.

Potential Environmental and Community Effects From Process Change

Impacts to the following aspects were considered for the chiller replacement project.

Environmental Aspect	Discussion of Potential Impact
Water Use	No additional water use required during normal operations. Additional small volumes would be required over the short-term during plant turnarounds or other plant shutdowns
Process Emissions	No additional emissions from previously approved.
Terrestrial Biota	None. No new footprint is required.
Socioeconomic Environment	None. Project does not significantly change plant operations.
Noise	None. Minimal increase in noise during construction
Odours	None. No change from previously approved
Light	None. No change from previously approved
Traffic	None. There may be a temporary difference in traffic during construction
Air Quality	None. No change from previously approved. Project will reduce electricity and natural gas consumption.

Environmental benefits from removing the chiller from the process include:

- During normal operations there will be no increase in freshwater use or wastewater generation.
- An annual reduction in electricity consumption of 450,000 kwh.
- An annual reduction of 33,000 m^3 of natural gas consumption.

NOA Requested Change to License

Condition 26 of the license prohibits the condensate stream inlet temperature to be below 12°C. Therefore, to facilitate the proposed process change Cenovus is requesting that condition 26 be amended to allow for the temperature of the liquid stream entering the absorber to not exceed 30^0C rather than the existing temperature range (i.e., 12°C to 30°C). With this proposed change, Condition 26 would read as follows:

> 26. The licensee shall install, calibrate, maintain and operate the ethanol absorption column according to manufactures specifications and shall install, calibrate, maintain and operate temperature indicators to monitor the temperature of the liquid streams in the ethanol absorber. The ethanol absorber column shall be operated so that the temperature of the condensate stream entering the absorber does not exceed 30^0C.

Project Schedule

Project activities are anticipated to begin with civil construction starting in September with a projected startup of early October 2022.

Closure

The proposed project results in improved ethanol recovery with no increase in water use or wastewater generation but significant decreases in electricity and natural gas consumption.

If you have any questions, or if you require any further information, please do not hesitate to contact Scott Hillier at 403-766-7356 or at scott.hillier@Cenvous.com .

Sincerely,

[redacted]

Scott Hillier, M.Sc., P. Eng. (AB)
Regulatory Services

[redacted]

Mounir Nasser, E.I.T
Staff Project Engineer
Downstream and Midstream Projects

Attachments

Attachment A: Process Flow Diagram

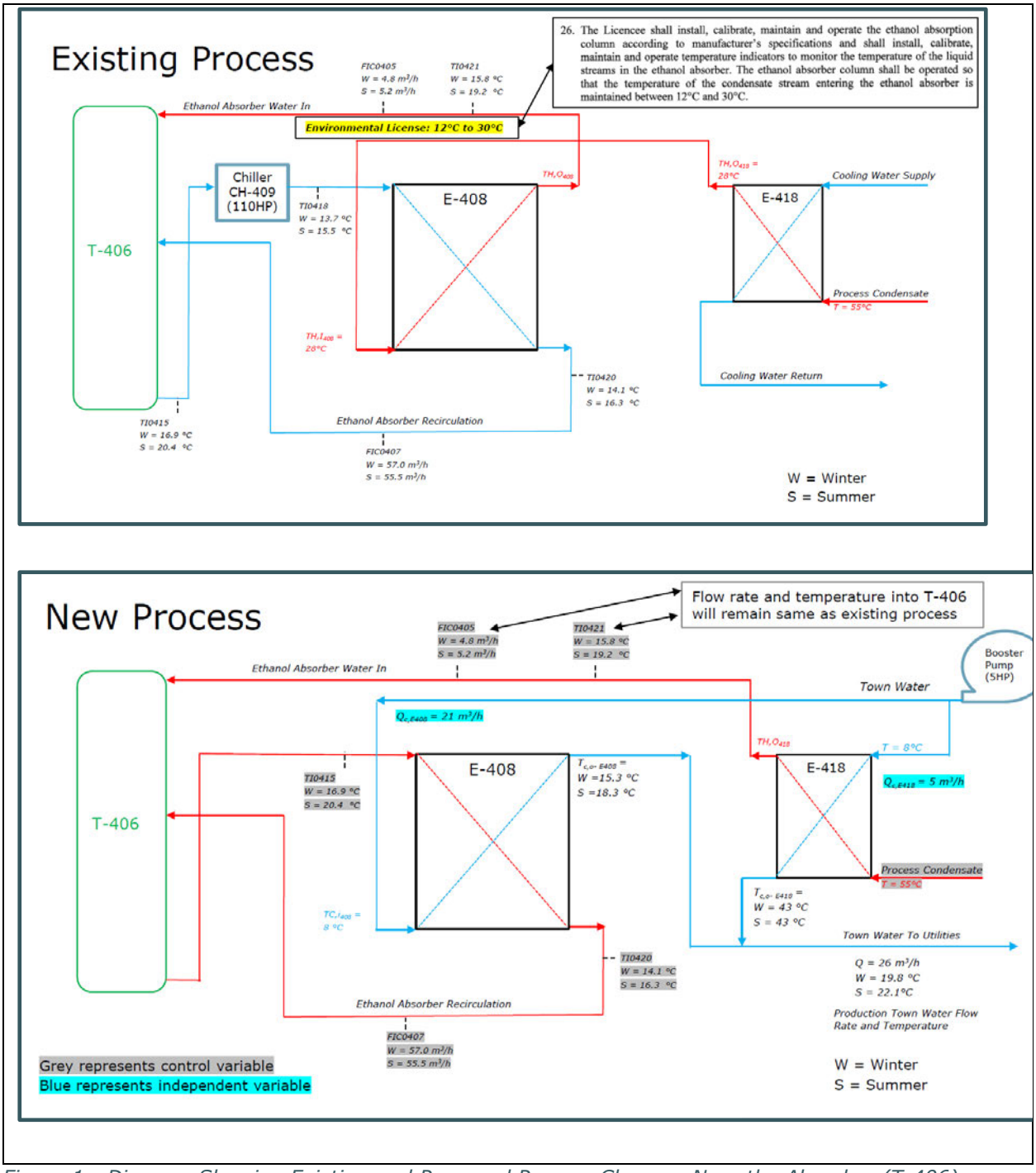

Figure 1 - Diagram Showing Existing and Proposed Process Changes Near the Absorber (T-406)

Attachment A

STREAM NUMBER	408	409	410	411	412
DESCRIPTION / COMPONENT, mass%	FERMENTER VENTS	BEER	EVAPORATOR CONDENSATE	ABSORBER VENT	ABSORBER WATER
WATER	2,33	78,95	99,99	0,71	92,02
ETHANOL	0,84	8,99	0,01	0,00	3,84
CARBON DIOXIDE	96,83	0,09	0,00	99,28	4,33
HEADS	0,01	0,00	0,00	0,01	0,01
FUSEL OILS	0,00	0,00	0,00	0,00	0,00
FERMENTABLE SOLIDS	0,00	0,00	0,00	0,00	0,00
NON-FERMENTABLE SOLIDS	0,00	11,97	0,00	0,00	0,00
TOTAL, lb/hr	29,645	311,422	7,998	29,201	9,244
TOTAL, kg/hr	13,447	141,259	3,628	13,245	4,193
TEMPERATURE, °F [°C]	95 [35]	95 [35]	121 [49]	59 [15]	62 [17]
PRESSURE, psig [kPa]	0 [0]	35 [243]	35 [243]	0 [-3]	52 [361]
LIQUID FLOW, gpm [liter/min]		604,7 [2289,1]	18,2 [61,2]		18,9 [71,4]
GAS FLOW, actm [m3/hr]	4673 [7939]			4354 [7397]	

VENT FROM TK-422
04-001

CIP HEADER FROM TK-422
04-001

ANTIFOAM FROM P-427
04-001

CO2 VENT FROM TK-501
05-001

(SEE NOTE #3) 409
FERMENTED MASH TO TK-501
05-001

(SEE NOTE #1) 408
CO2 VENT TO TK-501
05-001

FROM LC @ TK-428
04-004

CL-402A1,C1 CL-402A2,C2 TK-401A,C CL-402B1,D1 CL-402B2,D2 TK-401B,D

TC CTWS CTWR E-404A,C E-404B,D

SC P-405A,C P-403A,C P-410A P-405B,D P-403B,D P-410B

411 VENT B-411

FC LC T-406 P-407 412

CTWR CTWS CH-409 E-408 E-418 410

EVAPORATOR CONDENSATE FROM EV-700
07-001

ABSORBER WATER TO TK-501
05-001

MASH/CIP HEADER TO AND FROM TK-422
04-001

CIP HEADER TO TK-422
04-001

P-405A,C FERMENTER CIRCULATION PUMPS	CL-402A1,C1 FERMENTER CLEANERS	TK-401A,C FERMENTERS	CL-402A2,C2 FERMENTER CLEANERS	P-403A,C FERMENTER PUMPS	E-404A,C FERMENTER COOLERS	P-410A CIP RETURN PUMP	P-405B,D FERMENTER CIRCULATION PUMPS	CL-402B1,D1 FERMENTER CLEANERS	TK-401B,D FERMENTERS	CL-402B2,D2 FERMENTER CLEANERS	P-403B,D FERMENTER PUMPS	E-404B,D FERMENTER COOLERS	P-410B CIP RETURN PUMP	B-411 ETHANOL ABSORBER BLOWER	T-406 ETHANOL ABSORBER	P-407 ETHANOL ABSORBER CIRCULATION PUMP	CH-409 PROCESS WATER CHILLER	E-408 ETHANOL ABSORBER COOLER	E-418 PROCESS WATER COOLER

NOTES:
1. FERMENTER VENT STREAMS EQUAL AVERAGE FOR ALL FOUR (4) FERMENTERS.
2. HEAT DUTY SHOWN IS AT PEAK CONDITION, AND IS THE COMBINED DUTY FOR THE SYSTEM.
3. FLOW RATES SHOWN ARE TIME-AVERAGED VALUES. INTERMITTENT FLOW IS GREATER.
4. MATERIAL BALANCE IS SHOWN FOR KEY PROCESS STREAMS AT STEADY STATE. MATERIAL BALANCE DOES NOT INCLUDE STREAMS THAT ARE INTERMITTENT, INDETERMINATE, OR NORMALLY ZERO. VENTS FROM EQUIPMENT CONTAINING SUBCOOLED LIQUID HAVE ZERO FLOW AT STEADY STATE.

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#	DESCRIPTION	BY	DATE	APPD.

REVISIONS

KATZEN INTERNATIONAL, INC.
TECHNOLOGY • ENGINEERING CINCINNATI, OHIO, U.S.A.

HUSKY OIL LIMITED
MINNEDOSA, MANITOBA, CANADA

130 MM LPY WHEAT TO MFGE PROJECT PDP
PROCESS FLOW DIAGRAM
SECTION 400 – FERMENTATION AND CIP SYSTEM – SHEET 2 OF 4

ORIGIN:	DRAWN:	CHECKED:	DATE:	SCALE:	CLIENT No.:	DWG No.:	REV.
TNV	RLM	TNV	3/31/05	NONE	998-09	04-002	0