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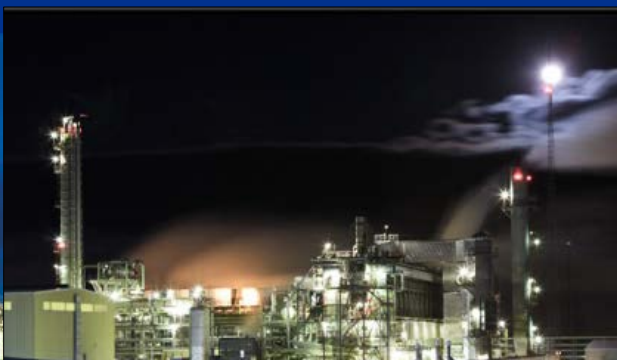
# PROJECT DESCRIPTION SUMMARY REPORT

## Methanex Medicine Hat Methanol Production Facility Expansion



METHANEX CORPORATION  
MEDICINE HAT, AB

*May 2013*



# METHANEX

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## PROJECT DESCRIPTION SUMMARY REPORT

### Purpose

The purpose of this document is to fulfill requirements within the *Canadian Environmental Assessment Act, 2012* for submission of a project description of a “designated project” to inform a decision, by the Canadian Environmental Assessment Agency, on whether or not an “environmental assessment” (as defined within CEAA) of the proposed project will be required.

### Proposed Project Overview

#### PROPOSED PROJECT CONTEXT

The impact of shale gas development in North America has resulted in a competitively priced natural gas environment. Given that natural gas is used as both a feedstock and a combustion fuel in the methanol production process, Methanex Corporation (Methanex) is investigating further methanol production options in North America to supply the fast-growing Asia Pacific market. A methanol expansion in Medicine Hat, Alberta is one of the North American options under consideration.

#### BACKGROUND OF METHANEX MEDICINE HAT LOCATION

Historically, the Methanex facility in Medicine Hat contained three methanol manufacturing plants with a combined capacity of 1 million metric tonnes per year. The site began production in February 1975 when Plant 1 was brought on-line. Plant 2 began production in 1976, and Plant 3 was brought on-stream in 1981.

High North American natural gas pricing and volatile market conditions resulted in the permanent shutdown of the Medicine Hat methanol Plant 2 in 1997 and Plant 1 in 1999. In 2001, Plant 3 was temporarily shutdown and preserved in a state that would allow for restart in the event of improved market conditions.

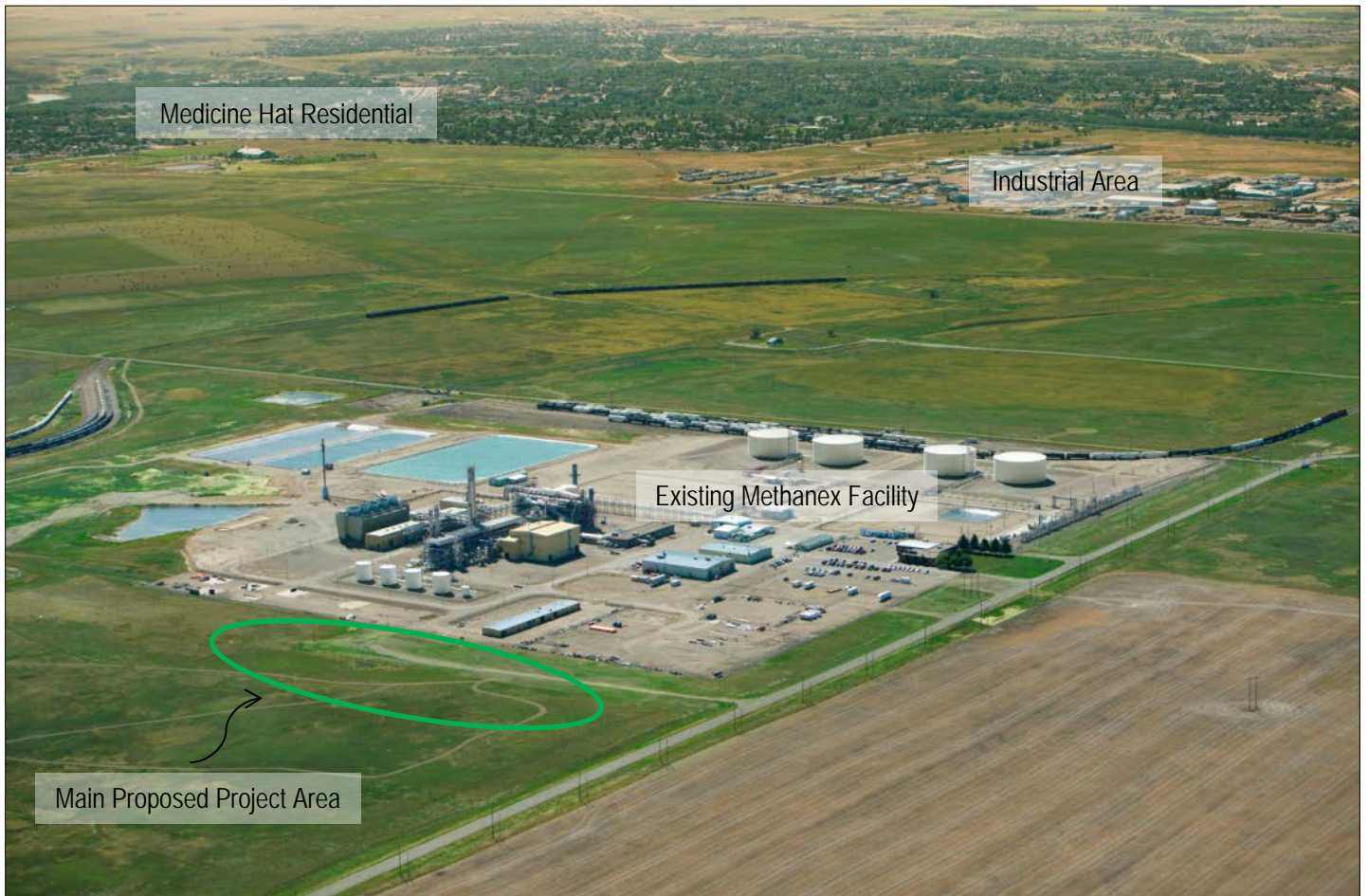
In 2003, demolition of Plants 1 and 2 began, while Plant 3 continued to sit idle in a state of preservation for potential future re-start. Fortunately, recent market conditions changed significantly with lower North American natural gas prices and stronger demand for methanol, which resulted in the viability of restarting Plant 3. In March of 2011, the Medicine Hat facility received Operating Approval from Alberta Environment and Sustainable Resource Development to begin operating Plant 3 to produce methanol.

#### PROPOSED PROJECT

The Methanex Medicine Hat Expansion Project (the Project) described in this project description document is an expansion of the existing Methanex Medicine Hat, AB methanol production facility via construction of a new methanol production unit at the existing location. The current production capacity at the existing Medicine Hat facility is approximately 0.5 million tonnes/year; the expansion project would result in a further 1 to

1.3 million tonnes/year of methanol production or an increase in methanol production of over 200%.

The project would be located within the City of Medicine Hat corporate limits in a heavy industrial area. Refer to *Figure 1 and 2* for a depiction of the regional location of the existing facility and the project location.



**Figure 1 - Existing Medicine Hat Facility and Location of the Main Proposed Project Area**

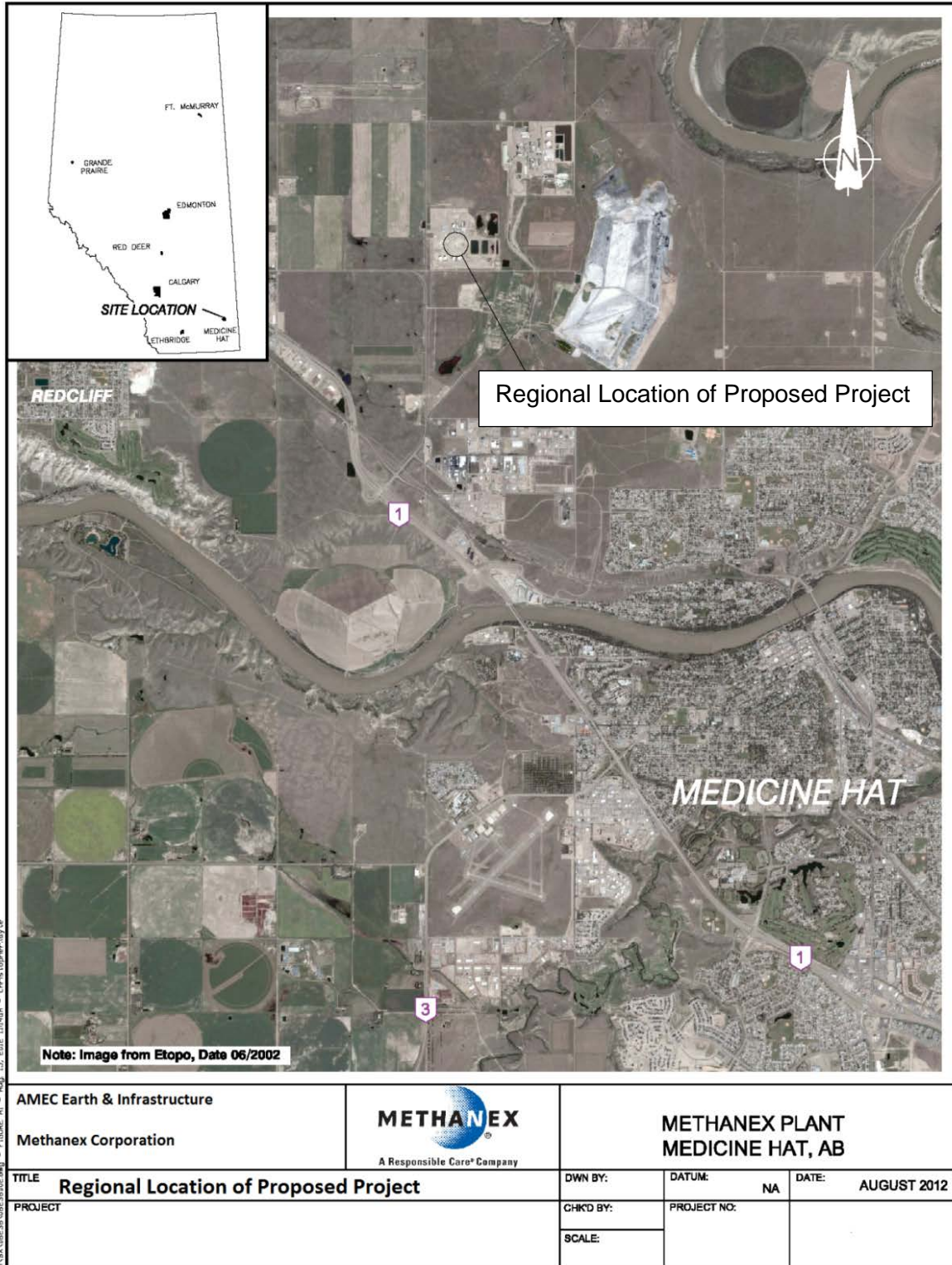
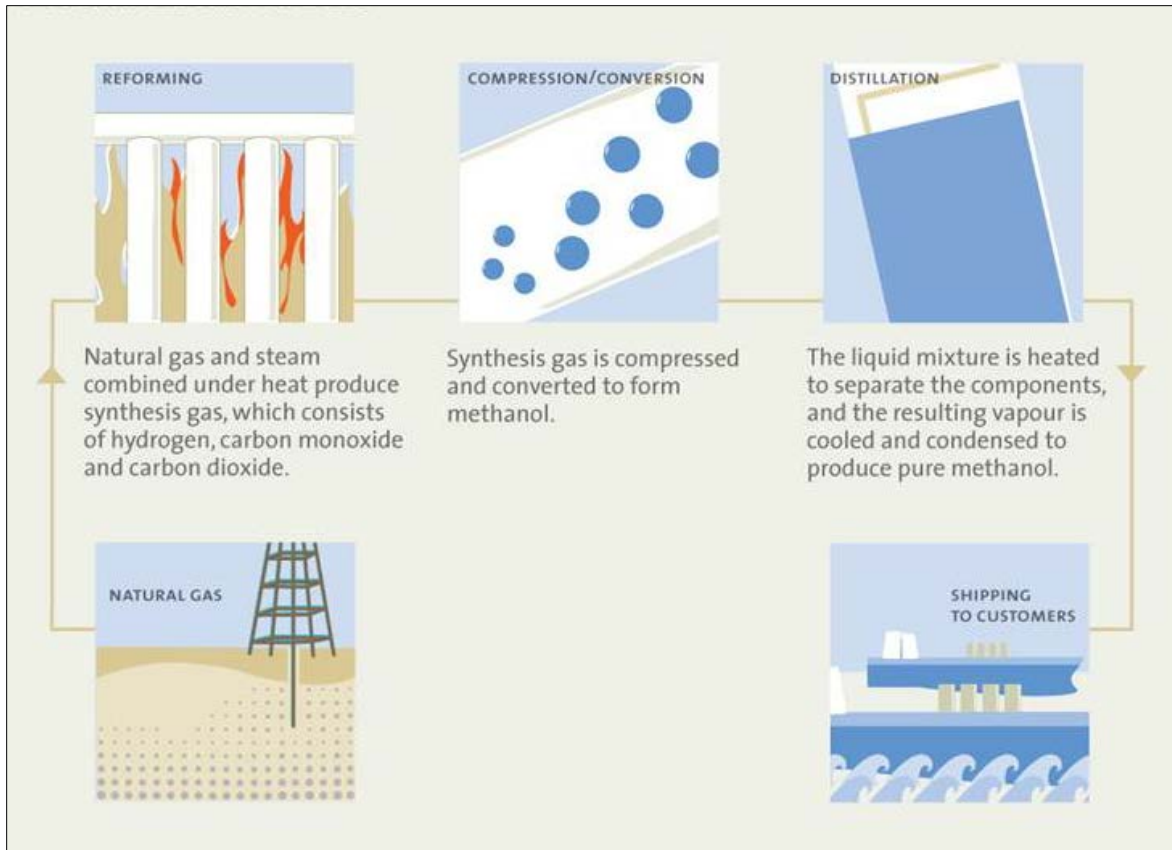


Figure 2 - Regional Location of Proposed Project and Methanex Medicine Hat

The proposed Project would make use of a conventional, multi-stage manufacturing process:

- Firstly, natural gas is mixed with steam in a conventional steam methane reformer to create reformed gas (also referred to as synthesis gas);
- The reformed gas then goes through a methanol conversion process, whereby crude methanol is produced; and.
- Lastly, crude methanol is distilled through a multi-stage distillation process, which results in pure, chemical grade methanol.



**Figure 3 - Methanol Production Overview**

### Relative Provision From The Regulations Designating Physical Activities

The proposed Project is considered to be a designated project for the purposes of the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), as it was deemed to be a physical activity fitting the following description from the Schedule of the *Regulations Designating Physical Activities* (SOR/2012-147):

20. *The construction, operation, decommissioning and abandonment, or an expansion that would result in an increase in its production capacity of more than 35%, of:*

d) *a facility for the manufacture of chemical products with a production capacity of 250 000 t/a or more.*

## Proponent Contact Information

### NAME OF THE DESIGNATED PROJECT:

Methanex Medicine Hat Expansion Project

### NAME OF THE PROPONENT:

Methanex Corporation

### ADDRESS OF THE PROPONENT:

3806 – Box Springs Rd. NW  
P.O. Box 1100  
Medicine Hat, AB  
T1A 7H1

### PLANT MANAGER:

Cliff Janzer  
Plant Manager  
Email: [cjanzer@methanex.com](mailto:cjanzer@methanex.com)  
Ph: (403) 527-8141 extension 105

### PRINCIPAL CONTACT PERSON:

Craig Marshall  
Environmental Coordinator  
Email: [cmarshall@methanex.com](mailto:cmarshall@methanex.com)  
Ph: (403) 527-8141 extension 129

## Other Environmental Assessment and/or Regulatory Requirements

### PROVINCE OF ALBERTA *ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT* APPROVAL REQUIREMENTS

The existing Medicine Hat facility is classified as a Division 2, Part 2 (b) (ix) “a petrochemical manufacturing plant” under the Alberta *Environmental Protection and Enhancement Act* (EPEA), *Activities Designation Regulation*. As such, the facility requires an EPEA Operating Approval from Alberta Environment and Sustainable Resource Development (AESRD). The existing facility currently holds EPEA Operating Approval No. 9887-03-03. An expansion to the facility (i.e. the construction and operation of a new/additional plant) would require an amendment to the current EPEA Operating Approval.

### PROVINCE OF ALBERTA *ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT* POTENTIAL ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The Project is not on the “Mandatory” or “Exclusion” list of the Alberta *Environmental Assessment (Mandatory and Exempted Activities) Regulation*. As such, it is considered a

discretionary activity and will need to be reviewed by AESRD, Environmental Assessment Team on a case-specific basis to determine whether or not Environmental Assessment is required.

### CITY OF MEDICINE HAT, ENVIRONMENTAL UTILITIES WATER AND SANITARY SEWER PERMIT

The existing Medicine Hat facility currently holds an Industrial Water and Sanitary Sewer Service Permit with the City of Medicine Hat, Environmental Utilities Department. To accommodate the proposed Project, the existing permit would need to be revised to reflect an increased freshwater supply rate and daily volume and an increased wastewater discharge rate and daily volume.

### Regional Study Information

There has not been a regional study under the *Canadian Environmental Assessment Act, 2012* in the Medicine Hat region of Alberta.

### Existing Methanol Production Facility Process and Component Description

Refer to Figure 4 below for a line drawing rendition of the main infrastructure and equipment at the existing Medicine Hat methanol production facility.

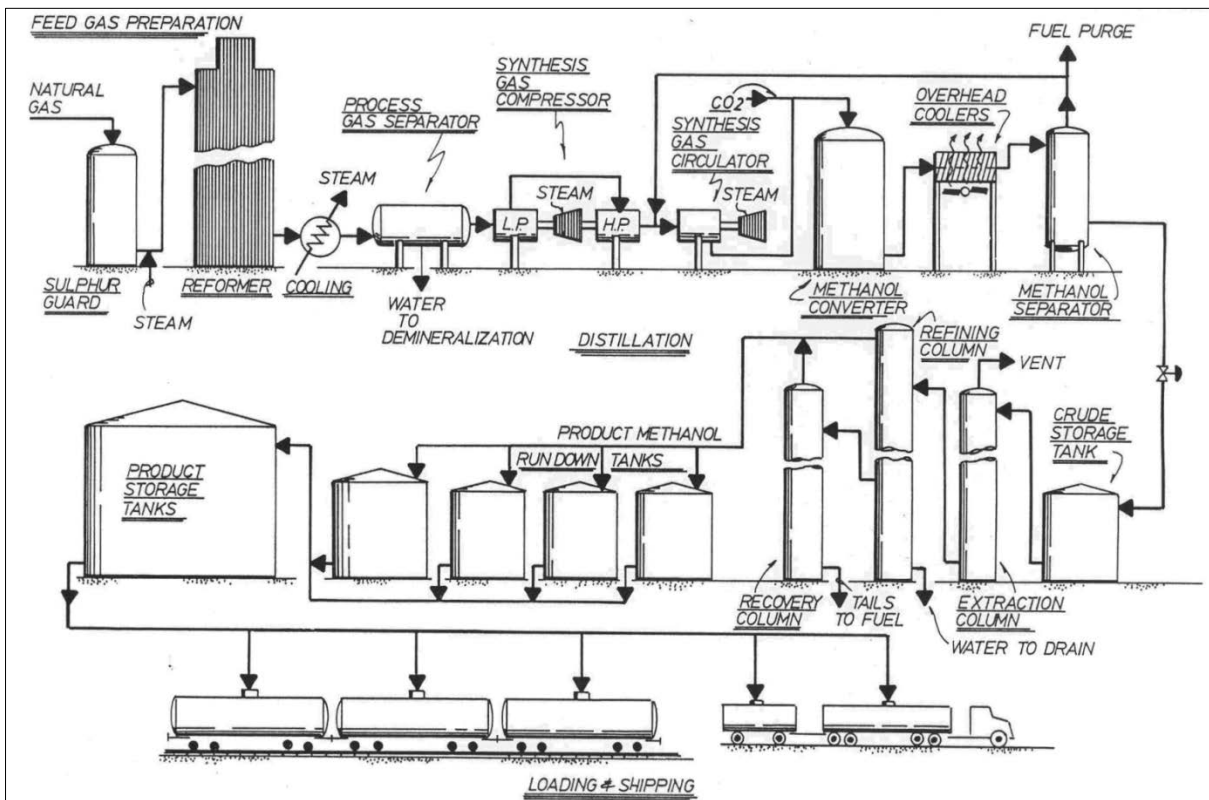


Figure 4 - Line Drawing Rendition of Main Infrastructure for Operations of Existing Facility



The methanol production process at the existing Medicine Hat methanol production facility is comprised of the following main processes – where applicable the main equipment and/or infrastructure is shown in brackets adjacent to the process:

- Feed gas preparation (sulphur guard vessel);
- Steam methane reforming (large steam methane reformer);
- Reformed gas compression (compressors and compressor building);
- Methanol conversion (methanol converter vessel);
- Crude methanol distillation (three distillation columns);
- Intermediate storage tanks (crude methanol, refined methanol, and tails storage);
- Methanol product loading systems (railcar and truck loading stations);
- Aerial cooling system (elevated bank of aerial coolers);
- Cooling water system (cooling water pumps, pump house, and cooling tower);
- Water treatment system (water treatment building and treatment equipment);
- Flare system (single flare stack);
- Wastewater systems (conveyance piping and wastewater storage ponds); and
- Industrial runoff system (conveyance ditches and storm water storage ponds).

### **Other Existing Non-Process Infrastructure**

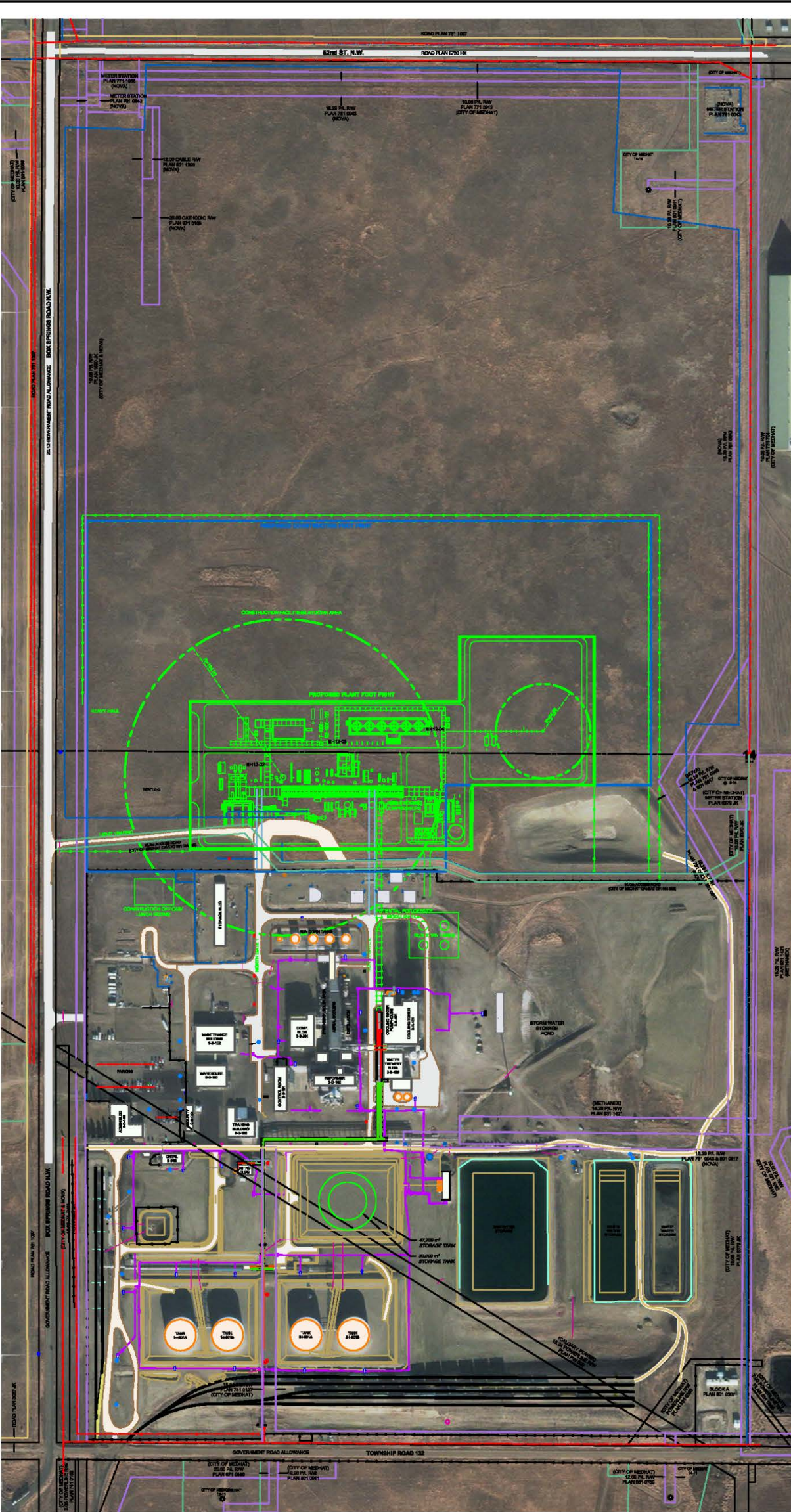
The following existing buildings / infrastructure are not directly involved in the methanol production processes, but are necessary to support the overall operation of the site:

- Administration building and parking lot;
- Security and miscellaneous workshop building;
- Training, laboratory, and storage building;
- Emergency response building;
- Warehouse;
- Maintenance shop and offices;
- Operations control room; and
- Storage, fabrication, and hazardous waste storage building.

It is expected that some expansion of these buildings or infrastructure would be required to accommodate the proposed Project.

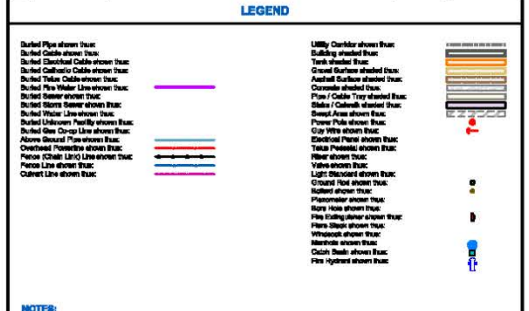
### **Components, Activities, and Proposed Physical works of the Proposed Project**

The following section lists and briefly describes the infrastructure and equipment that would be required for the proposed Project and the operation of a new methanol production unit. Figure 5 is a conceptual representation of the proposed Project layout.



**REVISION / ISSUED**

| No. | DATE           | DESCRIPTION | BY  | MWS - REF. # |
|-----|----------------|-------------|-----|--------------|
| ▲   | MARCH 22, 2013 | PLAN ISSUED | SMW | MS-102-13    |
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**NOTE:**  
 CONTOUR INTERVAL = 0.30m  
 Proposed plant information provided by Methanex.

**PRELIMINARY**



**METHANEX**  
 METHANEX PLANT SITE - MEDICINE HAT, ALBERTA - CANADA  
 PLAN 0809692  
 TOPOGRAPHIC SITE PLAN  
 W.1/2 Sec.14 Twp.13 Rge.6 W.4M.  
 CITY OF MEDICINE HAT

SCALE 1:2000  
 SHEET No. 1 of 1  
 MIDWEST SURVEY INC.  
 MEDICINE HAT - PHONE: 403-272-2864 (TOLL-FREE 877-816)  
 FAX: 403-272-2771  
 REVISION  
 M-0102-13

**Figure 5 - Proposed Project Conceptual Site Layout**

The methanol production process that would be employed for the proposed methanol production unit would utilize the same conventional methanol production process as the existing Medicine Hat methanol production unit with the exception of the addition of a saturator vessel.

Additionally, there are plans to take advantage of opportunities for interconnection and symbiosis between the proposed Project and the systems and infrastructure already existing at the Medicine Hat location. The advantage of symbiosis with the existing Medicine Hat location is that certain infrastructure and equipment already existing at the Medicine Hat facility would be utilized and only require relatively minor expansion versus construction of new infrastructure and equipment. The section “Existing Medicine Hat Site Physical Works Requiring Modification as Part of the Proposed Project” identifies the existing infrastructure and equipment that will be utilized to reduce the need for new construction.

- *Desulphurization unit*: removes sulphur from the natural gas that would be utilized as process natural gas in the steam methane reforming process.
- *Saturator*: vessel that saturates process natural gas with water vapour prior to the gas entering the steam methane reformer.

NOTE: the existing Medicine Hat methanol production unit does not have a saturator. The addition of a saturator to the proposed methanol manufacturing unit would increase process efficiency and decrease water usage and wastewater production.

- *Steam methane reformer (SMR)*: utilizes natural gas (methane/CH<sub>4</sub>) as a feedstock (under the necessary heat, pressure, and steam ratio, and in the presence of a catalyst) to produce reformed gas (or synthesis gas), which is comprised primarily of carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), and hydrogen (H<sub>2</sub>).
- *Auxiliary (package) boiler*: an auxiliary boiler would generate medium pressure steam used during plant startups and to control the steam header pressure during steady operation. Under steady operating conditions, the auxiliary boiler would run at less than 100% of its rated capacity.
- *Compressors / compressor building*: steam turbine driven compressors compress reformed gas from the SMR to the specific pressure required in the methanol conversion stage. The compressors would be housed inside of a compressor building.
- *Methanol converter*: vessel that would convert reformed gas (under the necessary heat and pressure, and in the presence of a catalyst) into crude methanol.
- *Distillation towers*: distillation towers would be installed with the purpose of distilling crude methanol (approximately 80% methanol, 20% water, and a small percentage of other components) into refined, chemical grade methanol. The number of distillation towers required for the proposed Project is not known at this time and would be determined during the detailed engineering phase.
- *Aerial cooling system*: the aerial cooling system would consist of a bank of elevated aerial coolers in the process area (consisting of large fans and piping with external fins to increase surface area for cooling) to provide convective cooling service to a process operations.

- *Rundown tanks*: two rundown tanks would be constructed (within the appropriate secondary containment structures) to contain “intermediate” refined methanol from the distillation stage.
- *Crude tank*: one crude tank would be constructed (within the appropriate secondary containment structures) to contain crude methanol from the methanol conversion processes (prior to distillation).
- *Tails tank*: one tails tank would be constructed (within the appropriate secondary containment structures) to contain tails fluid from the distillation stage.
- *Refined product storage tank*: one refined product storage tank would be constructed (within the appropriate secondary containment structures) to store refined methanol (received from the rundown tanks) prior to loading into railcars and tanker trucks for transportation to market.
- *Flare*: a single flare stack would be utilized to safely burn combustible gases generated during plant startup, shutdown, or periodic plant upsets. Flare gases would be piped from the plant to the flare stack where any flammable gases are combusted. Combustion products consist primarily of carbon dioxide and water vapours.

Upset conditions that would potentially lead to combustible gases being directed to flare include, but are not limited to: compressor turbine driver trips, 100% reformer trip, reformer trip to minimum fire, unexpected pressure surges, and other pressure upsets.

Under normal operating conditions, the flare would not operate and only the pilot flames would be burning.

### **Existing Site Physical Works Requiring Modification as Part of Proposed Project**

- *Water treatment system*: modifications in the form of an expansion to the site’s existing water treatment system would occur, rather than construction of a new stand-alone water treatment system for the new methanol production unit.

An expansion of the raw (fresh) water storage pond may also be required.

An additional consideration is the additional fresh water supply that would be required for the proposed Project. At present, the base case consideration is to continue to obtain the fresh water supply from the City of Medicine Hat, Environmental Utilities. Optionally, further investigation is being conducted into the construction and operation of a new river water pump house.

- *Wastewater systems*: it is expected that modifications to the wastewater systems, such as replacement of wastewater discharge pumps, new wastewater pond construction, or expansion of existing wastewater ponds, could be required to accommodate the proposed Project.

Wastewater from the site, including the additional wastewater produced from the operation of the Project, would continue to be discharged to the City of Medicine Hat sanitary sewer system.

- *Methanol product loading system*: modifications in the form of an expansion to the site's existing product loading system would occur, rather than construction of a new stand-alone product loading system for the new methanol production unit.
- *Distillation systems*: piping tie-ins would occur between the existing distillation systems and the distillation systems for the new methanol production unit to allow operational flexibility as required.

### **Potential Option for Construction and Operation of a River Water Pump House**

The present base case consideration is to continue to obtain the fresh water supply from the City of Medicine Hat, Environmental Utilities. Presently, the City of Medicine Hat, Environmental Utilities supplies water that is drawn from the Police Point Aquifer (untreated) and from the City's Municipal Water Treatment Facility. Due to the increased water supply demands of the proposed Project, the City would need to conduct some relatively minor modifications to the existing water supply pipelines within approximately two kilometres of the Methanex site.

Optionally, further investigation is being conducted into the construction and operation of a new river water pump house, which would annually draw not more than approximately 5 million m<sup>3</sup> of fresh water per year (volume includes supply for both the existing and proposed Project requirements) from the South Saskatchewan River. The investigation of this component of the proposed Project is in the very preliminary stages and details of a proposed location, water supply licensing, ownership and operation of the pump house (between Methanex and the City of Medicine Hat), and ownership and operation of the associated supply / piping infrastructure is not known. Methanex understands that additional Federal and Provincial regulatory approvals and clearances (ex. *Federal Fisheries Act* and *Navigable Water Act*, and *Alberta Water Act*) would be required for a project of this nature and further discussions with the necessary government departments / regulators would occur if the project was to materialize beyond preliminary consideration.

### **Civil Work Required for the Proposed Project:**

Civil work associated with the proposed Project would primarily include site grading, leveling, contouring, and installation of pilings and footings. The detail of the proposed civil work has not yet been determined and would be established during the detailed engineering stage of the proposed Project.

**Summary of Project Phases, Schedule, and Activities:**

**Table 1 - Summary of Project Phases, Schedule, and Activities**

| Project Phase                    | Estimated Duration (Years) | Description of Activities Occurring During Project Phase  |
|----------------------------------|----------------------------|---|
| Construction                     | 2 years                    | Civil construction activities<br>Equipment/vessel construction activities<br>Building and large infrastructure construction activities      |
| Operation                        | 20+ years                  | Production of methanol via conventional steam methane reformer, methanol conversion, and distillation processes / technologies              |
| Decommissioning                  | 2 years                    | Teardown and removal of equipment for recycling and/or potentially re-sale  |
| Site Remediation and Reclamation | 2-5 years                  | Site reclamation (re-grading, contouring, re-vegetation, etc.) for future determined, end land-use<br>Remediation of any contaminated areas |

**Project Location**

**GEOGRAPHIC COORDINATES OF CENTRE OF PROPOSED PROJECT LOCATION**

|          | Degrees | Minutes | Seconds | Datum  |
|----------|---------|---------|---------|--------|
| <b>N</b> | 50°     | 05'     | 02.9"   | WGS 84 |
| <b>W</b> | 110°    | 43'     | 42.0"   |        |

**LEGAL DESCRIPTIONS OF PROPOSED PROJECT**

The proposed Project would be located on portions of Methanex Corporation privately owned land with the following legal descriptions:

- NW Quarter of Section 14, Township 13, Range 6, West of the 4<sup>th</sup> Meridian
- SW Quarter of Section 14, Township 13, Range 6, West of the 4<sup>th</sup> Meridian

## Land Use

### ZONING DESIGNATIONS OF PROJECT LOCATION

In accordance with the City of Medicine Hat *Land-Use By-law No. 3181*, the proposed Project location is located within Land Use District “M3 - General Heavy Industrial”.

### CURRENT LAND OWNERSHIP OF PROJECT LOCATION

The proposed Project lands are currently privately owned by Methanex Corporation.

### APPLICABLE LAND USE WITHIN OR NEAR PROJECT LOCATION

The existing Methanex methanol production facility occupies heavy industrial land; a portion of the proposed Project will be located within this existing land use.

The proposed Project location to the north of the existing Methanex methanol production facility is vacant pasture/grass land with existing disturbances, such as gas well access roads, gas well sites, pipeline rights-of-way, and graveled “overflow” parking lot. Historically, this pasture land was used for agricultural purposes for grazing cattle; this activity has not occurred at this location since 2010 when the facility “re-start project” commenced.

To the north of the proposed Project location is Methanex privately owned vacant pasture/grass land.

To the east of the proposed Project location is heavy industrial land privately owned by Canadian Fertilizers Ltd and currently operated for the manufacture and shipment of nitrogen fertilizer (ammonia and urea).

To the west of the proposed Project location is Box Springs Road and privately owned agricultural land (pasture/grass land and crop land); a portion of the land to the west is currently for sale for potential commercial development.

To the south of the proposed Project location is privately owned former Western Cooperative Ltd. heavy industrial land currently under active reclamation and remediation; the current land cover is pasture/grass land and hay crops.

### MARINE TERMINAL AT PROJECT LOCATION

The proposed Project location does not involve the construction, operation, decommissioning, or abandonment of a marine terminal.

The proposed Project does require the use of a marine terminal to enable shipment of the methanol product to international markets. Although not directly involved with the proposed Project, Methanex is currently also evaluating potential options on the west coast of Canada for location/use of a marine terminal.

## **PROXIMITY TO PERMANENT, SEASONAL, OR TEMPORARY RESIDENCES**

The proposed Project location is approximately:

- 2.7 km from the nearest residential area within Redcliff, AB (NW side of Highway 1); and
- 2.9 km from the northeast Crescent Heights subdivision within Medicine Hat, AB.

## **PROXIMITY TO FEDERAL LANDS**

The project is not on or in close proximity to any Federal lands.

## **PROXIMITY TO ABORIGINAL LANDS**

**(TRADITIONAL TERRITORIES, SETTLEMENT LAND UNDER A LAND CLAIM AGREEMENT, LANDS USED FOR TRADITIONAL PURPOSES BY ABORIGINAL PEOPLES)**

There is no known settlement land under a land claim agreement within close proximity to the proposed Project location.

The proposed Project will not require access to, use or occupation of, or exploration, development, and/or production of lands or resources currently used for known traditional purposes by Aboriginal peoples.

Given that the proposed Project is still in the feasibility phase, Methanex has initially undertaken preliminary consultation activities and plans to conduct further consultation, as required, at a later stage. The engagement and consultation with Aboriginal groups section of this executive summary describes the work that Methanex has completed to identify First Nations and Métis groups that may potentially have traditional territories or traditional land uses in the area of the proposed Project. It is noted that detailed consultation with each of the Aboriginal groups would be required to determine whether the project area is specifically within their traditional territories or in proximity to lands used for traditional purposes.

Methanex has forwarded a letter with a high-level description of the proposed Project to all of the identified Aboriginal groups encouraging the groups to contact Methanex with comments or questions in regards to the proposed Project.





**Figure 6 - Central Location Viewing North**



**Figure 7 - Central Location Viewing East**  
(Canadian Fertilizers Ltd. in background)



**Figure 9 - Central Location Viewing West**



**Figure 8 - Central Location Viewing South**  
(existing Methanex infrastructure in background)

## Federal Involvement

### PROPOSED OR ANTICIPATED FEDERAL AUTHORITY FINANCIAL SUPPORT

The proposed Project would not receive any Federal financial support from any Federal authorities.

### FEDERAL LANDS USED FOR THE PURPOSE OF CARRYING OUT THE PROPOSED PROJECT

The proposed Project would not require the use of any Federal lands for the purpose of carrying out the proposed Project.

### FEDERAL LEGISLATIVE OR REGULATORY REQUIREMENTS

It is not anticipated that any Federal legislative or regulatory requirements, beyond those within the *Canadian Environmental Assessment Act* requiring the submission of this project description, will be applicable to the base case of the proposed Project.

## Potential Environmental Effects

### CONTAMINANT EMISSIONS TO AIR

#### *Air Emissions Resulting from the Combustion of Fuels:*

The primary air emission contaminants that would be released as a result of combustion of natural gas and other fuels used to create heat for the process are: carbon dioxide (CO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and minor amounts of volatile organic compounds (VOCs). The main combustion sources would be the steam methane reformer and auxiliary boiler.

It is expected that NO<sub>x</sub> reduction technology in the form of low NO<sub>x</sub> burners and/or selective catalytic reduction would be included in the design of the proposed Project to mitigate the release of NO<sub>x</sub> emissions to air.

The proposed Project would be subject to Provincial greenhouse gas (GHG) legislation and regulation stipulating targets for reduction of GHGs (applicable to the CO<sub>2</sub> emissions mentioned previously). Additionally, Methanex is currently in discussion with Environment Canada regarding the development of Federal GHG regulations that will likely set a GHG emission intensity standard for new facilities; applicability of Federal regulations would depend on the date that regulations come into force.

#### *Methanol Vapour Air Emissions:*

The potential for the emission of methanol vapour, a volatile organic compound (VOC), exists from fugitive emissions from process equipment and components, storage tank vents, product loading operation vents, and distillation vents.

To mitigate the release of methanol vapours, Methanex Medicine Hat currently conducts an annual fugitive emission leak detection monitoring and repair program, operates

methanol vapour scrubbing systems for methanol storage tanks and product loading operations, and recovers distillation vent vapours for use as combustion fuel in the steam methane reformer. It is expected that all of these methanol vapour emission control technologies would be included in the design of the proposed Project.

*Air Emissions From Cooling Towers:*

Air emissions from cooling towers are mainly comprised of pure water vapour. However, it would be expected that relatively small amounts of particulate matter and VOCs, carried in water droplets that become entrained in the cooling tower air emissions stream (cooling tower drift), would also be emitted from the cooling towers. Cooling towers for the proposed Project would be equipped with high efficiency drift eliminators, which would mitigate the amount of particulate matter and VOCs emitted from this source.

*Air Emissions During Construction:*

Air contaminant emissions specifically due to the proposed Project during the construction phase (vs. the existing methanol manufacturing unit operations that would be occurring simultaneously) would primarily include internal combustion engine exhaust from construction machinery (ex. heavy machinery required for civil work) and other construction vehicles. It is expected that this would be a minor source of air contaminant emissions.

## **LIQUID DISCHARGES**

*Sanitary and Process Wastewater Systems:*

All sanitary waste and process wastewater would be discharged to the City of Medicine Hat sanitary sewer system. Process wastewater sources would include: cooling tower blowdown, water treatment system liquid waste, distillation refining column bottoms, and storm water runoff from specific process areas.

As discussed previously, construction and operation of the new methanol production unit would involve the installation of a saturator vessel, which reduces the production of wastewater.

*Secondary Containment Systems:*

Areas of high potential contamination associated with the proposed Project (ex. chemical storage tank areas, distillation areas, etc.) would be equipped with appropriate secondary containment systems that would contain any leaks or releases of potential contaminants.

## **WASTE TYPES AND DISPOSAL METHODS**

The proposed Project would produce routine types of industrial waste, some of which would be considered hazardous waste under Alberta Provincial regulations. All generated waste will be recycled where facilities exist for that waste type; in the event that recycling is not an available or feasible option, waste would be disposed of at appropriate facilities dictated by the waste type. All hazardous waste disposal or

recycling will be performed in accordance with applicable Provincial and Federal legislation and regulations.

#### **CHANGES TO WILDLIFE OR HABITAT UNDER FEDERAL JURISDICTION**

There is no fish or fish habitat, no amphibian breeding habitat, and no wetlands in the proposed Project area. The highly disturbed native prairie in the proposed Project area provides only marginal nesting habitat for migratory birds and there are no wetlands or waterbodies present in the proposed Project area. As such, there will not be any changes caused to fish and fish habitat (as defined in the *Fisheries Act*), aquatic species (as defined in the *Species at Risk Act*), or migratory birds (as defined in the *Migratory Birds Convention Act, 1994*) as a result of the proposed Project.

#### **CHANGES TO THE ENVIRONMENT ON FEDERAL LANDS OUTSIDE OF ALBERTA / CANADA**

No changes will occur to the environment on Federal lands outside of the Province of Alberta or outside of Canada as a result of carrying out the proposed Project.

#### **EFFECT OF CHANGES TO THE ENVIRONMENT ON ABORIGINAL PEOPLES**

It is believed that there will not be any negative effects on Aboriginal peoples as a result of any changes to the environment that may be caused as a result of carrying out the proposed Project, including effects on socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes, or any structure, site, or thing that is of historical, archaeological, paleontological, or architectural significance.

### **Environmental Setting**

As support for the Feasibility Study, Methanex retained TERA Environmental Consultants (TERA) to complete a high level environmental overview of the proposed Project area and surrounding vicinity to identify environmental sensitivities within the Project area based on readily available and recent environmental reports, database searches, and a site visit.

TERA documented the findings of the high level environmental overview in a report titled *Environmental Overview for the Proposed Methanex Corporation Medicine Hat Plant Expansion* report (the Report) (TERA, 2013). The Report provides information relevant to environmental legislation and regulations, land use and natural resource use, terrain and soils, hydrology and fish, vegetation, wildlife, and historical resources. The Report also provides the results of a site visit which was conducted to supplement and verify the information collected for the proposed Project area.

#### **TERRAIN AND SOILS**

No significant terrain or soils issues were observed during the desktop review or the site visit.

## HYDROLOGY AND FISH

There are no fish-bearing permanent waterbodies or watercourses and no fish-bearing habitat present within or directly adjacent to the proposed Project area. No wetlands of any classification were observed during the site visit.

## VEGETATION

The proposed Project is located in southeastern Alberta in the Dry Mixedgrass Natural Subregion of the Grassland Natural Region. The environmental sensitivity of the Dry Mixedgrass Natural Subregion is well-documented and native prairie land is recognized for its significant ecological, cultural and economic value. Native vegetation can be very difficult to re-establish if disturbed, due to shallow profile, poorly-developed or erosion prone soils. Rare vascular plant species and rare ecological communities have the potential to occur in the Dry Mixedgrass Natural Subregion.

The Project is located within the Sensitive Ranges of Endangered and Threatened Plants (AESRD 2010-2012). A historical occurrence of tiny cryptanthe (*Cryptantha minima*), a species listed federally under Schedule 1 of the *Species At Risk Act* (SARA) as Endangered and listed as Threatened by the *Committee on the Status of Endangered Wildlife in Canada* (COSEWIC) (2013), has been identified in the proposed Project area within 14-13-6 W4M (Alberta Conservation Information Management System [ACIMS] 2012).

## WILDLIFE

The region includes many distinct habitat types and unique wildlife species that are only found in the Dry Mixedgrass Natural Subregion, including eastern short-horned lizard, greater sage grouse, mountain plover, Ord's kangaroo rat and sage thrasher (Natural Regions Committee 2006), all of which are listed as Endangered under Schedule 1 of SARA.

The level of disturbance within the existing plant itself is likely too high to attract nesting migratory birds, however, suitable nesting habitat for migratory birds is present within the native prairie located directly adjacent to the existing Methanex facility.

The proposed Project is located within the Sensitive Ranges of several species with special conservation status including: Burrowing Owl Range; Eastern Short-horned Lizard Range; Sensitive Amphibian Range for Great Plains toad and plains spadefoot; Sensitive Raptor Range for ferruginous hawk, golden eagle and prairie falcon; and Sharp-tailed Grouse Range. The proposed Project is also located within the species ranges of other sensitive and endangered species including long-billed curlew, short-eared owl, Sprague's pipit and upland sandpiper (AESRD 2010-2012). Sensitive Snake Range for bullsnake, plains hognose snake and prairie rattlesnake is also located approximately 432 m north of the proposed expansion area (AESRD 2010-2012).

A search of the AESRD Fisheries and Wildlife Management Information System (AESRD 2013) resulted in an incidental occurrence of plains spadefoot (listed as May Be at Risk by AESRD [2011]) within 1 km of the proposed Project area (Lupyczuk 2000).

No wildlife species with special conservation status or their key habitat features were directly observed during the site visit, however, recent diggings of an American badger were observed throughout the proposed Project area. Existing disturbance in the Project area (i.e., elevated noise levels, existing industrial sites, pipelines, well sites, Box Springs Road and well site access roads), reduces the likelihood of the proposed Project area providing habitat for wildlife species with special conservation status.

### **HISTORICAL RESOURCES**

The proposed Project is not located on lands with a listed Historical Resource Value by Alberta Culture; clearance under the *Historical Resources Act* is not required.

No historical resources or any evidence of the potential presence of a historical resource was observed during the site visit.

### **ENVIRONMENTAL SETTING SITE VISIT DETAILS**

A site visit was conducted of the proposed Project area on April 4, 2013. The objective of the site visit was to verify and supplement the information gathered through the desktop review. The site visit was conducted on foot by two TERA biologists and consisted of a thorough ground search of the proposed plant expansion area and surrounding vicinity.

The proposed Project area is located on gently undulating native prairie within a heavy industrial area that contains high amounts of existing disturbance. Disturbance within the proposed Project area includes: the existing Methanex facility, located directly south of the proposed expansion area; the Canadian Fertilizers Ltd. facility, located approximately 265 m northeast of the east boundary of the proposed expansion area; and Box Springs Road, located approximately 200 m west of the proposed expansion area. Smaller scale disturbances also present in the Project area include pipeline rights-of-way, well sites, and well site access roads. The existing Methanex facility is operational 24 hours a day resulting in consistently elevated noise levels throughout the proposed Project area.

Invasive plant species were observed within the proposed Project area. The existing heavy industrial sites, in combination with other existing disturbances (i.e. pipelines, well sites, and well site access roads) have likely facilitated the introduction of invasive plant species to the proposed Project area. Since the site visit was conducted outside of the growing season, the presence or absence of weeds could not be confirmed during the site visit.

The native prairie within and directly adjacent to the proposed Project area has the potential to provide habitat for rare plants, rare ecological communities, and wildlife species with special conservation status and their key habitat features (ex. nests, dens, leks, etc.). However, the high level of existing disturbance in the proposed Project area (i.e. elevated noise levels, existing heavy industrial sites, pipelines, well sites, Box Springs Road, and well site access roads) reduces the likelihood of this area providing habitat for rare plants, rare ecological communities, and wildlife species with special conservation status. Since the site visit was conducted outside of the growing season, the presence or absence of rare plants and rare ecological communities could not be confirmed during the site visit. No wildlife species with special conservation status or

their key habitat features were directly observed during the site visit, however, recent diggings of an American badger were observed throughout the proposed Project area. Despite the previously reported occurrence of plains spadefoot within 1 km of the proposed Project, no amphibian breeding habitat was observed. No wetlands were observed within or directly adjacent to the proposed Project area.

No obvious soils issues were observed during the site visit.

### **Conclusions Based on Environmental Setting Information**

The high level of existing disturbance in the proposed Project area (i.e. elevated noise levels, existing heavy industrial sites, pipelines, well sites, Box Springs Road, and well site access roads) reduces the likelihood of this area providing habitat for rare plants, rare ecological communities, and wildlife species with special conservation status. However, the native prairie within and directly adjacent to the proposed Project area does have the potential to provide habitat for rare plants, rare ecological communities, and wildlife species with special conservation status and their key habitat features (e.g., nests, dens, leks, etc.); vegetation and wildlife field studies would be required prior to construction and early in an engineering and design stage to confirm their presence or absence.

Although there has been a historical occurrence of tiny cryptanthe (*Cryptantha minima*) identified within the vicinity of the proposed Project, it is not expected to be found within the proposed Project location as the habitat is not suitable for its presence (i.e. generally present on sandy soils and proposed Project location is located on relatively heavy clay till soils).

There are no fish-bearing permanent waterbodies or watercourses and no fish-bearing habitat present within or directly adjacent to the proposed Project area.

No amphibian breeding habitat occurs at the proposed Project location and no wetlands were observed within or directly adjacent to the proposed Project area.

The highly disturbed native prairie in the proposed Project area provides only marginal nesting habitat for migratory birds and there are no wetlands or waterbodies present in the proposed Project area. It is not expected that there will be any conflicts with migratory birds.

No significant issues with terrain or soil were noted for the proposed Project location.

There is no conflict with any known historical resources noted for the proposed Project location.

### **Engagement and Consultation with Aboriginal Groups**

As support for the proposed Project, Methanex retained AMEC Human Environment (AMEC) to complete a high level investigation to identify Aboriginal groups that may be potentially affected and/or interested in the proposed Project, provide some general information about traditional territories, traditional land use, and land claims, and develop a proposed Aboriginal consultation plan.



## POTENTIALLY AFFECTED / INTERESTED ABORIGINAL GROUPS

The following is a discussion of the First Nations and Métis groups that may potentially have traditional territories and land uses in the area of the proposed Project location. It is noted that contact with each of the Aboriginal groups would be required to determine whether the proposed Project area is specifically within their traditional territories or in proximity to any traditional land uses.

### *First Nations:*

The project site and Medicine Hat, AB is on the boundary between Treaty #4 (Manitoba and Saskatchewan) and Treaty #7 (Southern Alberta); these treaties are between Canada and the First Nations. There are no reserves, as defined in the *Indian Act*, in the Medicine Hat area. Treaty #4 and Treaty #7 First Nations may have traditional territories in the project area and a general discussion of their traditional territories is presented in the following sections.

Contact with each of the identified First Nations would be required to determine whether the project area is specifically within their traditional territories or in proximity to any traditional land uses.

### *Treaty #4 First Nations:*

The proposed Project is potentially within the traditional territory of members of File Hills Qu'Appelle Tribal Council. Specifically, one of the Tribal Council member Nations, Nekaneet First Nation, has a reserve in Southwestern Saskatchewan near Cypress Hills Interprovincial Park, SK, approximately 35 kilometres southwest of Maple Creek, SK and 85 kilometres southeast of Medicine Hat, AB. In its 1987 Claim Submission, Nekaneet First Nation stated that in the late 1800s, the Nation was a separate band in southwestern Saskatchewan. The band consisted of two groups: one located in the Saskatchewan Cypress Hills and one around Medicine Hat; this indicates that the Nekaneet First Nation historically used resources in the Medicine Hat area and potentially within or near the proposed Project area.

### *Treaty #7 First Nations:*

The Siksika, Kainai, and Piikani First Nations are members of the Blackfoot Confederacy, which also includes the Blackfeet of Montana. As described on the Siksika Nation website, the Blackfoot, or the Children of the Plains, used a traditional territory that stretched from the North Saskatchewan River in Alberta and Saskatchewan to the south into Montana and from the Rocky Mountains to the Great Sand Hills in Saskatchewan. The proposed Project area would be on lands fitting the description of their traditional territory.

The Stoney Nakoda First Nation has a land claim that extends across southern Alberta from the Rocky Mountains to the Alberta/Saskatchewan border, again encompassing the Medicine Hat and proposed Project area.

The Tsuu T'ina Nation are an Athapascan people with ties to northern Aboriginal peoples including the Beaver and Dene. Their traditional activities took place both in the

Rocky Mountains and on the plains. Those traditional activities may have extended into the Medicine Hat area and proposed Project area.

*Métis:*

The Métis of southern Alberta are represented by the Métis Nation of Alberta Region 3. The Métis Nation in Medicine Hat is represented by Métis Local Council #8. Their location in the proposed Project area suggests that the Métis may have conducted traditional activities in the area and could be affected by the proposed Project. Contact with the Métis Local Council #8 would be required to determine whether the proposed Project area is specifically within their traditional territories.

**ABORIGINAL CONSULTATION AND ENGAGEMENT PLAN**

Given that the proposed Project is still in the feasibility phase, Methanex has initially undertaken preliminary consultation activities and plans to conduct further consultation, as required, at a later stage. It is noted that detailed consultation with each of the Aboriginal groups would be required to determine whether the project area is specifically within their traditional territories or in proximity to lands used for traditional purposes. Methanex has forwarded a letter with a high-level description of the proposed Project to all of the identified Aboriginal groups encouraging the groups to contact Methanex with comments or questions in regards to the proposed Project.

To carry out any further required Aboriginal engagement and consultation, Methanex would contact each of the previously identified First Nations and Métis groups to determine whether any of the Aboriginal groups have traditional territory, traditional land uses, or land claims in or near the proposed Project area that could be affected by the proposed Project. For those groups that indicate they have Aboriginal interests that could be affected by the project, Methanex will work with those individual Aboriginal groups to establish a protocol to determine the level and timing of each consultation and engagement. It is noted that some of the Aboriginal groups have consultation guidelines which would inform the consultation and engagement protocol and process. For example, the Métis Nation of Alberta has policy guidelines regarding the duty to consult and these are available on their website (<http://www.albertametis.com/MNAHome/Industry-Relations.aspx> ; accessed April 16, 2013); the Stoney Nation conducts their consultation through the Stoney Information Letter.

Further Aboriginal consultation and engagement would provide each of the interested Aboriginal groups with information regarding the proposed Project scope, timing and opportunities for discussion. Methanex would provide opportunities for each Aboriginal group to express any concerns and interests with the proposed Project. Methanex would record and respond to those concerns and to questions about the proposed Project. Methanex would include the interested Aboriginal groups in the distribution of information that is provided to other groups and stakeholders.

## **Consultation with Public and Other Non-Aboriginal Groups**

Methanex's goal is to build meaningful and sustainable relationships with communities potentially affected by existing and future operations. The objectives of consultation with public and other non-aboriginal groups (stakeholders) are to inform and identify concerns and issues that can be proactively addressed during the project design and/or operation. Given that the proposed Project is still in the feasibility phase, Methanex has initially undertaken preliminary consultation activities and plans to conduct further consultation, as required, at a later stage.

Through face-to-face meetings, plant tours, and telephone meetings, general information about the proposed Project was presented to a select list of stakeholders. Methanex has addressed all concerns and comments raised during these consultations and will continue to do so in accordance with the processes required by respective regulations and/or legislation.

## **Consultation with Other Jurisdictions**

Methanex has conducted initial consultations with representatives from both the Environmental Assessment Group and the Industrial Authorizations Team of Alberta Environment and Sustainable Resource Development (AESRD) regarding Provincial Environmental Assessment requirements and Alberta *Environmental Protection and Enhancement Act* operating approval requirements associated with the proposed Project.