

November 4, 2014

Ms. Kirsten Walli,
Board Secretary
Ontario Energy Board
2300 Yonge Street, 27th Floor
Toronto, ON M4P 1E4

Dear Ms. Walli:

Re: EB-2014-0333 – Sarnia Expansion Pipeline Project

Attached is an Application by Union Gas Limited for an Order granting leave to construct a natural gas pipeline and ancillary facilities in the Township of St. Clair, in the County of Lambton.

The construction of the Proposed Pipeline will allow the Applicant to ensure the continued reliable, safe delivery of natural gas and to serve the growing Sarnia market.

Should you have any questions, please do not hesitate to contact me. I look forward to receipt of your instructions.

Yours truly,

[Original signed by]

Mark Murray
Manager, Regulatory Projects
and Lands Acquisition

Attach.

c.c.: P. Duguay
Z. Crnojacki

ONTARIO ENERGY BOARD

IN THE MATTER OF The Ontario Energy Board Act,
1998, S.O. 1998, c.15, Schedule B, and in particular, s.90
thereof;

AND IN THE MATTER OF an Application by Union Gas
Limited for an Order granting leave to construct a natural
gas pipeline and ancillary facilities in the Township of St.
Clair, in the County of Lambton.

UNION GAS LIMITED

1. Union Gas Limited (the “Applicant”) hereby applies to the Ontario Energy Board (the “Board”), pursuant to Section 90(1) of the Ontario Energy Board Act (the “Act”), for an Order granting leave to construct approximately 4.8 kilometres of NPS 20 natural gas pipeline (the “Proposed Pipeline”), in the Township of St. Clair, in the County of Lambton.
2. Attached hereto as Schedule “A” is a map showing the general location of the proposed pipeline and the municipalities, highways, railways, utility lines and navigable waters through, under, over, upon or across which the proposed pipeline will pass.
3. The construction of the Proposed Pipeline will allow the Applicant to ensure the continued reliable, safe delivery of natural gas and to serve the growing Sarnia market.
4. The Applicant requests that this Application be dealt with in accordance with Section 34 of the Board’s Rules of Practice and Procedure for written hearings.

5. The Applicant now therefore applies to the Board for an Order granting leave to construct the proposed pipeline as described above.

Dated at Municipality of Chatham-Kent this 4th day of November, 2014.

[Original signed by]

Per: Mark Murray,
Manager, Regulatory Projects and Lands
Acquisition
Union Gas Limited

Comments respecting this Application should be directed to:

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Manager, Regulatory Projects & Lands Acquisition
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Fax: 519-436-4641

Email:
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Sarnia Expansion Pipeline Project

TOWNSHIP OF St. CLAIR

Rokeby-Line

SIL

Payne

Moore-Line

Legend

★ Payne Storage Facility "Payne"

◆ Sarnia Industrial Line "SIL"

●● Pipeline Route

Existing Features

— Major Road

— Local Road

+ Railway

Base features produced under
license with the Ontario Ministry
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0 0.25 0.5
km



St-Clair-Parkway

Emily Street

Greenfield Road

Highway 40

Ladysmith Road

SARNIA EXPANSION PIPELINE PROJECT

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PROJECT SUMMARY

Union Gas Limited ("Union"), pursuant to Section 90 of the Ontario Energy Board Act, requests approval from the Ontario Energy Board ("OEB") for Leave to Construct 4.8 kilometres of NPS 20 hydrocarbon (natural gas) pipeline ("Proposed Pipeline") in order to ensure the continued reliable, safe delivery of natural gas and to serve growing Sarnia market demand.

The Proposed Pipeline will extend from Union's Payne Storage Facility ("Payne") to the Sarnia Industrial Line ("SIL") System in the Township of St Clair, as shown on Schedule 1-1.

The Sarnia market has grown significantly over the past decade such that the SIL is currently near capacity. This market is continuing to develop with demand expected to grow by approximately 120 TJ/d in the next 5 years. Union currently has two contracts in place for almost half of this capacity. Based on the contracts currently executed, and the potential for additional demand beyond 2015, Union expects that demand in the future will meet or exceed the capacity of the Proposed Pipeline by 2019.

The SIL System is supplied through a combination of four third-party pipeline systems directly connected to the SIL System as well as through Union's own facilities. The ability to direct supply destined for Dawn into the SIL System has effectively delayed the need for Union to build infrastructure to connect Dawn and the SIL System. However with the recent changes in the natural gas supply and transportation dynamics in North America, there has been a decrease in the flow of natural gas between Michigan and Ontario. Flow has decreased to the point that in certain situations there is not enough gas flowing into Union's system to meet the

requirements of the SIL System. Since November 1, 2013 (to August 31, 2014) there were 69 days, or 22% of the time, where available supply would have been insufficient to meet winter 2015/2016 SIL System forecast design day demand. Further, when compared to the forecast design day demand effective winter 2019/2020, there were 134 days, or 44% of the time, since November 1, 2013 where supply would have been insufficient to meet SIL System design day demand. Given this supply risk and the increasing demands on the SIL System, Union requires additional capacity and security of supply for the Sarnia market.

Union reviewed a number of alternatives to address security of supply and demand growth for the Sarnia market. Both facility and commercial alternatives were reviewed to meet the current and future demands of the SIL System. The preferred alternative is to build a 4.8 kilometre NPS 20 pipeline from the Payne Storage Pool to the Novacor Corunna Station on the SIL System. This alternative is preferred for the following reasons:

- a. It is the least cost; most other alternatives require at least 10 kilometres of large diameter pipeline, just to serve the demand growth and would require a commercial solution in addition to provide security of supply.
- b. Facilities owned and controlled by Union connected to Dawn through Union's integrated Storage and Transmission system increase security of supply.
- c. By constructing a NPS 20 pipeline both security of supply issues and growth demands can be met most efficiently, addressing each issue separately (security of supply and demand growth) through two facilities, or a facility and commercial solution, would be significantly more costly.

1 The total cost of the project is \$24.31 million, consisting of \$18.36 million for the pipeline
2 facilities and \$5.95 million for the associated station facilities to connect Payne and the SIL
3 system. This is allocated as \$21.49 million for security of supply and \$2.81 million for demand
4 growth. An economic analysis has been completed on the demand growth portion of the project
5 which results in a Profitability Index of 1.06. All costs will be included in rates in Union's 2019
6 rebasing application.

7
8 An Environmental Report ("ER") has been prepared for the Proposed Pipeline. There will be no
9 significant environmental impacts related to the construction of the Proposed Pipeline given
10 Union's standard construction procedures, the mitigation measures recommended in the ER, and
11 the fact that the majority of the Proposed Pipeline will be located within or adjacent to road
12 allowance.

13
14 Union has or will obtain all the necessary land rights prior to construction.

15
16 Construction of the Proposed Pipeline is scheduled to commence in the summer of 2015 to
17 utilize the favourable summer construction weather and environmental windows. Union requests
18 OEB approval by May 31, 2015 to insure that the in-service date for the project of November 1,
19 2015 can be met.

SARNIA INDUSTRIAL SYSTEM OVERVIEW

The purpose of this section of evidence is to provide an overview of demands and supply for the SIL System. This section of evidence also provides an overview of system operations.

The SIL System is Union's largest volume and most geographically concentrated in-franchise market and is located west of Dawn (i.e. not along the Dawn Parkway System). The SIL System is Union's closest major in-franchise market to the Dawn Hub. The SIL System currently has limited connectivity to the Dawn Hub and primarily relies on upstream pipelines for natural gas supply¹.

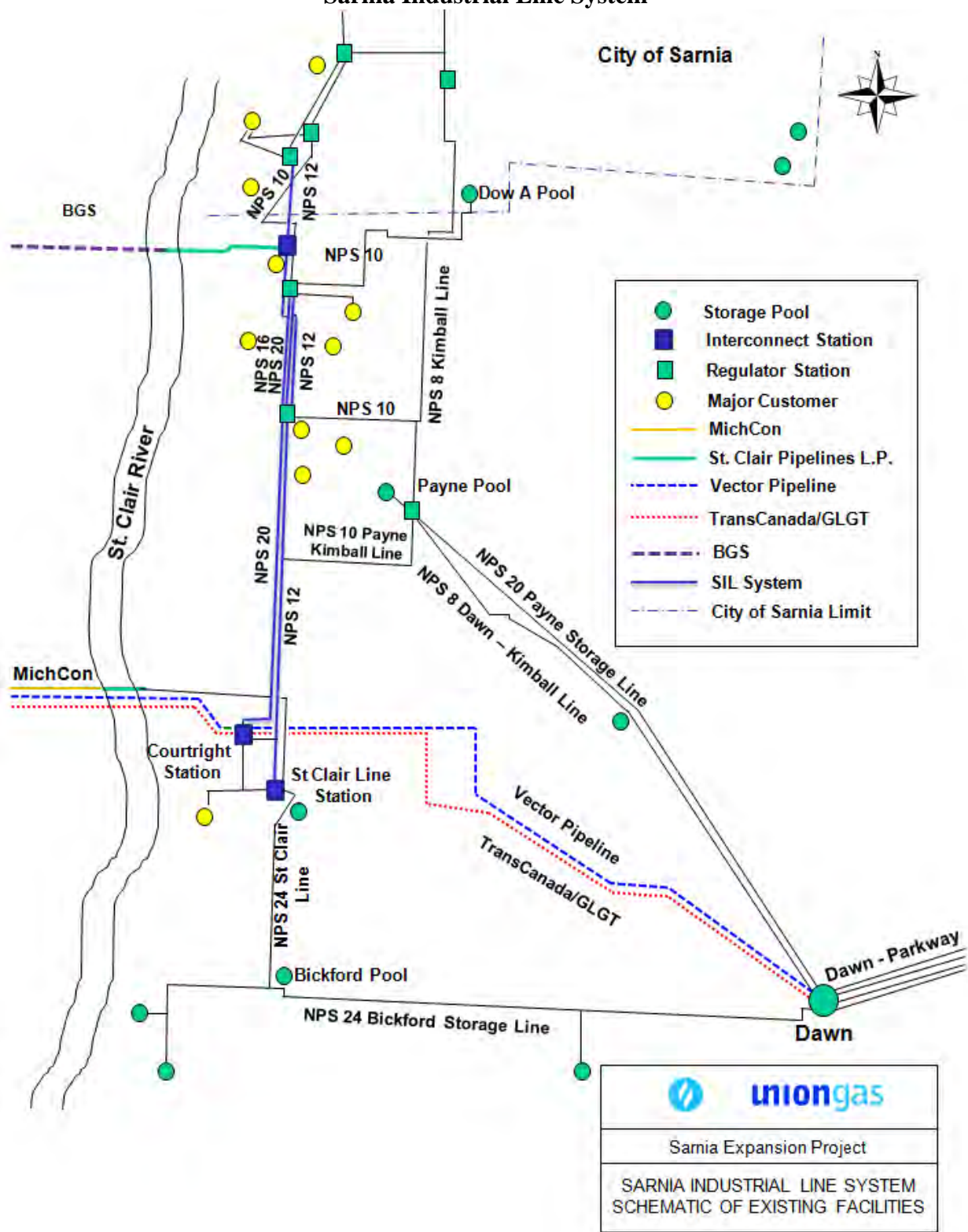
Demand Overview

The Sarnia area is primarily served from the SIL which supplies natural gas to residents, businesses and industry. Sarnia is home to Ontario's largest concentration of petrochemical industry (known as "Chemical Valley"), Canada's largest integrated hazardous waste management complex, Canada's largest and oldest petroleum research centre, and Canada's largest ethanol plant.

A schematic of the SIL System, including interconnections and major industrial customers, is included as Figure 2-1.

¹ Union's Dawn Parkway System and the Dawn Hub have been previously described in Pre-Field Evidence in EB-2012-0433, Section 2; EB-2013-0074, Section 3; and EB-2014-0261, Exhibit A, Tab 4.

Figure 2-1
Sarnia Industrial Line System



1 The majority of the SIL System demand is comprised of direct purchase customers, such as
2 power generators and large industrial customers. Residential and small commercial/industrial
3 customers constitute approximately 10% of the SIL System demand. SIL System forecast design
4 day demand has more than doubled in size since the winter of 1998/1999. Union is forecasting
5 continued growth in industrial demand on the SIL System as further described in Section 3.

6
7 The design day demand for Union's in-franchise market areas typically occurs in the winter, with
8 summer demand being much less. The SIL System demand requirements however are relatively
9 similar in the summer months (April – October) and the winter months (November – March)².

10 The SIL System is unique in this regard for two primary reasons:

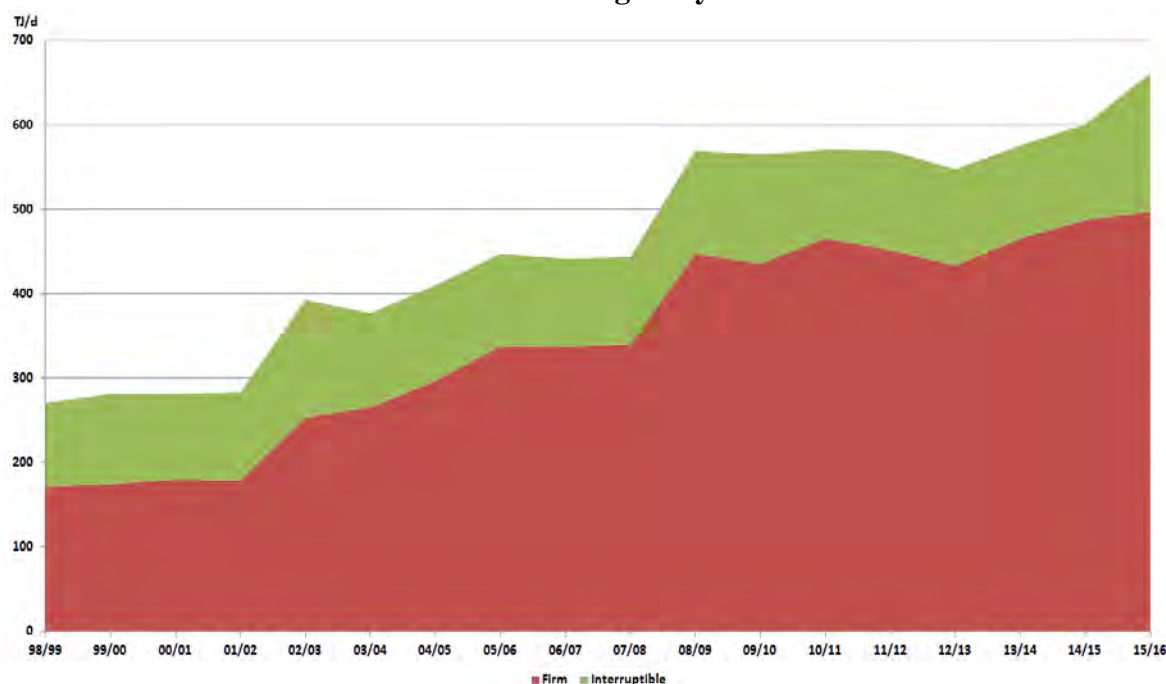
- 11 i. Major industrial customers, comprising the majority of the SIL System market, contract
12 to meet their demand on a year-round basis (i.e. both summer and winter); and
- 13 ii. Union's storage connected to the SIL System becomes a demand in the summer during
14 the injection period.

15
16 SIL System forecast design day demand from 1998/1999 to 2015/2016 is shown in Figure 2-2³.

² For instance, the winter 2015/2016 design day demand is forecast to be 661 TJ/d, while the summer 2016 design day demand is forecast to be approximately 30 TJ/d less. Design day demand is addressed in further detail in Section 5.

³ The gas year starts November 1 and ends the following October 31. For instance, gas year 2015/2016 starts November 1, 2015 and ends October 31, 2016.

Figure 2-2
Sarnia Market Design Day Demand



Supply Overview

The SIL System is primarily supplied through a combination of four, directly connected, third-party pipelines as well as through Union's own facilities. The four third-party pipelines which flow gas from Michigan into Ontario and are:

- TransCanada PipeLines Ltd. ("TransCanada")/Great Lakes Gas Transmission ("GLGT")
- Vector Pipeline L.P. ("Vector Pipeline")
- Michigan Consolidated Gas Company ("MichCon")
- Bluewater Gas Storage, LLC ("BGS")

Union also supplies the SIL System through its own facilities, including the Dow A Pool (winter) and the NPS 8 Kimball Line. The SIL System can also receive natural gas from the NPS 10 Payne Kimball Line which historically has been used to provide security of supply.

1

2 Each of the third-party interconnecting pipelines, as well as Union's own facilities that supply
3 natural gas to the SIL System are described in more detail below. A map showing U.S. Midwest
4 and eastern Canadian pipeline systems is included as Schedule 2-1.

5

6 **TransCanada/GLGT**

7 The TransCanada Mainline directly connects to the SIL System at Courtright and also directly
8 connects to Dawn a little further east. At the international border under the St. Clair River, the
9 TransCanada Mainline connects to TransCanada's affiliate, GLGT, at a point called St. Clair,
10 which is the southern terminus of the GLGT system. This portion of the TransCanada Mainline
11 is wholly located within Ontario and is known as the St. Clair to Dawn segment.

12

13 At its northern terminus, the GLGT system connects to the TransCanada Mainline at a point on
14 the Manitoba/Minnesota border called Emerson. The TransCanada Mainline extends from the
15 Alberta/Saskatchewan border at Empress and splits into two paths in Manitoba, one of which
16 goes south to Emerson⁴. The GLGT system runs south from Emerson through Minnesota,
17 Wisconsin and Michigan and re-connects to the TransCanada Mainline at St. Clair. The
18 combination of the TransCanada Mainline and the GLGT system provide eastern markets access
19 to Western Canadian Sedimentary Basin ("WCSB") supply on an Empress to Dawn path.

⁴ The other path goes across northern Ontario to North Bay and TransCanada's Eastern Ontario Triangle.

1 Union has the ability to direct up to 0.4 PJ/d of supply from the GLGT system, via the
2 TransCanada St. Clair to Dawn segment, into the SIL System at Courtright⁵. Before the Vector
3 Pipeline, MichCon and BGS connections to the SIL System were completed, Union primarily
4 relied on TransCanada/GLGT system flow to supply the SIL System.

5
6 Union does not contract firm transportation on the TransCanada/GLGT system to deliver natural
7 gas to Dawn or to the SIL System. Therefore, Union has no direct control on the quantity of
8 natural gas that flows past Courtright to Dawn on this path. Two factors have made supply on
9 the TransCanada/GLGT system into the SIL System and Dawn less reliable:

- 10 • Flow into Dawn has significantly declined due to changing North American natural gas
11 supply and transportation dynamics, limiting the amount of supply available to the SIL
12 System.
- 13 • The TransCanada/GLGT system has experienced reverse flow conditions under which
14 Union provides natural gas from Dawn to TransCanada. Under reverse flow conditions,
15 Union cannot direct supply into the SIL System at Courtright⁶.

16
17 These factors have contributed to increased supply risk for the SIL System as more fully
18 discussed in Section 4. Based on the fundamental changes in North American natural gas supply
19 and transportation dynamics, Union does not expect that flows into Dawn on the
20 TransCanada/GLGT system will increase or be more consistent in the future.

⁵ Union directs flow into the SIL System at Courtright and to complete TransCanada's deliveries to Dawn on the Emerson to Dawn path, Union provides TransCanada the same amount of natural gas at Dawn as is directed into the SIL System (displacement).

⁶ Union cannot displace natural gas directed into the SIL System at either Emerson or other points on the GLGT system. To direct natural gas into the SIL System during reverse flow on the TransCanada/GLGT system, Union would require a Dawn to St. Clair transportation service on TransCanada.

1 **Vector Pipeline**

2 The Vector Pipeline system directly connects to the SIL System at Courtright and also directly
3 connects to Dawn a little further east (similar to the TransCanada/GLGT system). The Vector
4 Pipeline system commences in the Chicago area with connections to the Alliance Pipeline
5 system, as well as a number of other pipelines, and runs east through Michigan to Dawn.
6 Historically, the Vector Pipeline system has received a large amount of natural gas supply from
7 the WCSB (through Alliance Pipeline). The Vector Pipeline system has the ability to deliver
8 approximately 1.5 PJ/d of natural gas to Dawn and, in addition, Union has the ability to direct up
9 to 0.4 PJ/d from the Vector Pipeline system into the SIL System at Courtright.

10

11 Union holds 85 TJ/d of firm long-term transportation capacity from Chicago to Dawn on the
12 Vector Pipeline system which serves the needs of its in-franchise customers. This capacity is
13 renewable and has been held by Union since the inception of the Vector Pipeline. Union, from
14 time to time, will contract for short-term firm transportation capacity on the Vector Pipeline as
15 part of its gas supply portfolio. Union has recently contracted for 26 TJ/d of short-term firm
16 transportation capacity with term ending October 31, 2017 (non-renewable).

17

18 Union is able to utilize its firm transportation capacity to deliver natural gas to the SIL System at
19 Courtright from the Vector Pipeline system. In addition, Union can deliver the equivalent
20 amount of natural gas from Dawn to Courtright to serve the SIL System provided there is
21 sufficient flow into Dawn on the Vector Pipeline system⁷. Union directly controls only a small

⁷ The Dawn to Courtright transportation service on the Vector Pipeline system (bifurcated service) is completed by displacement.

1 portion of the Vector Pipeline capacity to Union's system and therefore a small portion of the
2 quantity of natural gas that flows past Courtright to Dawn on this path.

3
4 In 2013 and 2014, supply from the Vector Pipeline system into Union's system decreased as the
5 market value of transportation between Chicago and Dawn contracted⁸. Decreasing market
6 value of transportation between Chicago and Dawn creates flow uncertainty on the Vector
7 Pipeline system, contributing to Union's concern regarding supply risk for the SIL System.

9 **MichCon**

10 MichCon is a large natural gas distribution entity located in Michigan with both transmission and
11 storage assets. The MichCon system connects to the St. Clair Pipelines L.P. system at the
12 international border (St. Clair River Crossing) and Union's SIL System connects to the St. Clair
13 River Crossing pipeline within Ontario near Courtright⁹. The MichCon system is directly
14 connected to natural gas storage and production in Michigan and interconnects with numerous
15 pipeline systems that transport natural gas from liquid hubs and production field zones (GLGT,
16 ANR, Panhandle Eastern, Consumers Energy and Vector Pipeline). The MichCon system also
17 interconnects with the BGS storage system.

18
19 The SIL System receives supply via the MichCon system at the southern terminus of the SIL at
20 Union's St. Clair Line Station. Union has the ability to direct up to 0.16 PJ/d (physical firm

⁸ The market value of transportation between two points is often referred to as the basis differential. The difference in the cost to purchase natural gas at two trading points, such as Chicago and Dawn, reflects the market value of transportation between those two trading points.

⁹ St. Clair Pipelines L.P., an affiliate of Union's, connects to the MichCon system at the International Boundary under the St. Clair River at a trading point known as Union St. Clair. The St. Clair Pipelines L.P. pipeline (St. Clair River Crossing) connects to Union at the St. Clair Valve Site adjacent to the St. Clair River in the Township of St. Clair. From the St. Clair Valve Site, natural gas flows to Dawn on Union's NPS 24 St. Clair Line and NPS 24 Bickford Storage Line. The SIL System is fed from the St. Clair Line Station located on the NPS 24 St. Clair Line.

capacity of the interconnection) of natural gas flowing from the MichCon system to Ontario into the SIL System at this point (which facilitates MichCon to Dawn transportation service¹⁰) and that natural gas is consumed within the SIL System. Union has contracted for transportation capacity on the St. Clair Pipelines L.P. system (St. Clair River Crossing) which provides access to supply via the MichCon system¹¹.

Union, from time to time, will contract for short-term firm transportation capacity on MichCon as part of its gas supply portfolio. Union has recently contracted for 11 TJ/d of short-term firm transportation capacity with term ending October 31, 2015 (non-renewable). Therefore, Union does not have direct long-term control on the quantity of natural gas that flows to Ontario via the MichCon system.

Flow from Michigan to Ontario via the MichCon system is largely influenced by the market value of transportation between Michigan and Dawn such that the value of natural gas at Dawn must exceed the value of natural gas in Michigan for MichCon to Dawn flow to occur. Historically, flow from Michigan to Ontario via the MichCon system has been volatile based on market conditions and cannot be considered a sustainable or reliable source of supply.

BGS

BGS is a natural gas storage operator located in Michigan that offers storage, balancing and transportation (wheeling) services, some of which allow for injections in Michigan and

¹⁰ In the winter, under certain operating conditions, Union can also flow 0.29 PJ/d to Dawn on Union's St. Clair to Bickford system.

¹¹ If required for security of supply, Union would need to purchase spot supply on the MichCon system or transportation services to move existing supply to the MichCon system.

1 withdrawals at Dawn. The BGS system connects to the St. Clair Pipelines L.P. system (the
2 Bluewater Pipeline) at the international border¹². The BGS system is connected to multiple
3 pipelines in Michigan, including MichCon, Vector Pipeline, ANR, GLGT and Consumers
4 Energy. Union's SIL System connects to the St. Clair Pipelines L.P. system (the Bluewater
5 Pipeline) within Ontario at the north end of the SIL near Corunna.

6
7 Union has the ability to flow up to 0.3 PJ/d of BGS supply into the SIL System which facilitates
8 a Bluewater to Dawn service. The quantity available can vary and is dependent upon SIL
9 System operating conditions. BGS holds 123 TJ/d of winter only, firm transportation capacity to
10 Dawn (facilitated by displacement) which is used to provide its storage, balancing and
11 transportation (wheeling) services. Union has contracted for transportation capacity on the St.
12 Clair Pipelines L.P. system (the Bluewater Pipeline) which provides access to supply via the
13 BGS system¹³.

14
15 All of the natural gas delivered from the BGS system is consumed within the SIL System. Union
16 does not contract for storage services with BGS to serve its in-franchise customers. Therefore,
17 Union does not have direct long-term control on the quantity of natural gas that flows to Ontario
18 via the BGS system.

19
20 Flow from Michigan to Ontario via the BGS system is influenced by the quantity of services that
21 BGS contracts with Dawn withdrawals and the market value of transportation between Michigan

¹² St. Clair Pipelines L.P., an affiliate of Union, connects to BGS at the International Boundary under the St. Clair River at a trading point known as Bluewater. St. Clair Pipelines L.P. connects to Union near the Bluewater/Union Interconnect Valve Site at the SIL in the vicinity of Lasalle Road and Highway 40 in the Township of St. Clair.

¹³ If required for security of supply, Union would need to purchase spot supply on BGS.

1 and Dawn. Historically, flow from Michigan to Ontario via the BGS system has been volatile
2 based on market conditions and cannot be considered a sustainable or reliable source of supply.

4 **Union's Facilities**

5 Union has one storage pool, the Dow A Pool that provides supply directly into the SIL System.
6 The Dow A Pool is located at the north end of the SIL in the City of Sarnia. Dow A Pool uses
7 SIL System flow to inject in the summer, which contributes to seasonal demand on the SIL
8 System by 43 TJ/d. Withdrawals from the Dow A Pool are available to supply the SIL System in
9 the winter, approximately 70 TJ/d on a design day.

11 Union also uses the NPS 8 Kimball Line to supply lower pressure pipeline systems located at the
12 north end of the SIL System. The NPS 8 Kimball Line is connected to Payne and indirectly to
13 Dawn, and due to its lower operating pressure cannot provide supply to the higher pressure SIL.
14 The NPS 8 Kimball Line provides 18 TJ/d in the summer and 23 TJ/d in the winter, and is not a
15 significant source of supply for the Sarnia market.

17 Union's NPS 10 Payne Kimball Line connects the SIL to Union's storage and transmission
18 system at Payne. The NPS 10 Payne Kimball Line provides up to 82 TJ/d and has historically
19 provided some security of supply for the SIL System. When the NPS 10 Payne Kimball Line is
20 utilized, supply is sourced from Dawn via the NPS 20 Payne Storage Line. SIL System market
21 growth has exceeded the security of supply capability of the NPS 10 Payne Kimball Line.

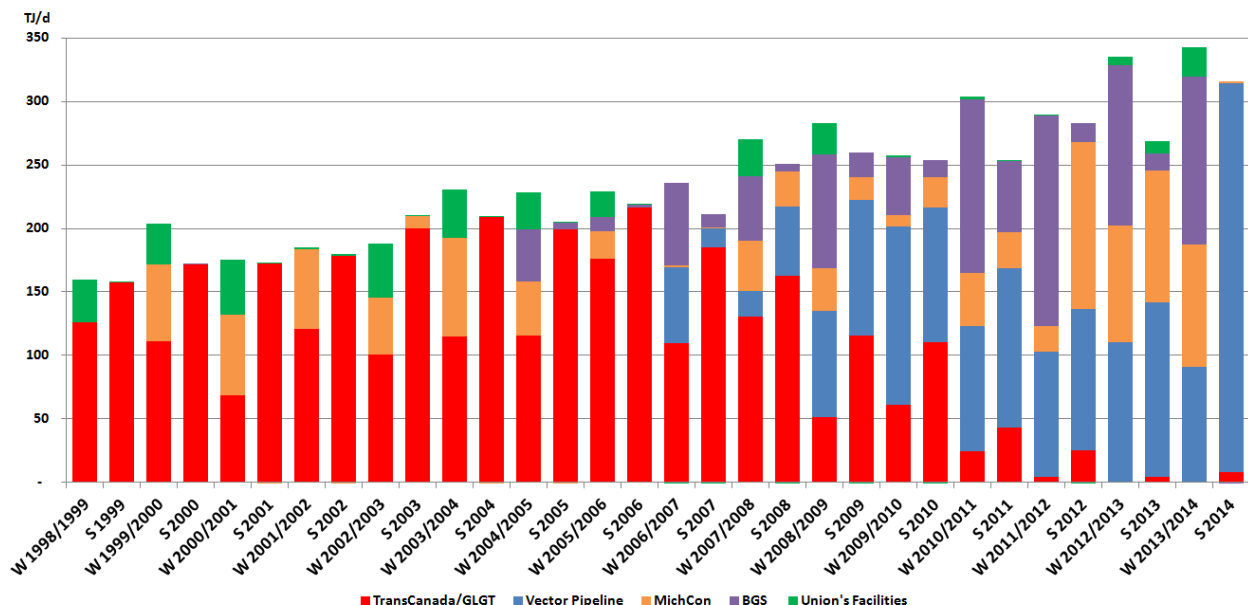
System Operation Overview

Union serves the Sarnia market demand by directing natural gas into the SIL System from any of the four third-party interconnecting pipelines as well as utilizing Union's own facilities. Union uses its integrated assets and interconnections to ensure market demands are met.

Historically, there has been sufficient flow into Dawn from western sources throughout the 1990s and much of the 2000 to 2010 time period to supply the SIL System. The ability to direct supply destined for Dawn into the SIL System, particularly from Vector Pipeline and TransCanada/GLGT, has effectively delayed the need for Union to build infrastructure to transport natural gas from Dawn to the SIL System.

Average seasonal supply to the SIL System from November 1, 2008 to August 31, 2014 is provided, by source, in Figure 2-3.

Figure 2-3
Average Seasonal SIL System Supply by Source



1 The TransCanada/GLGT system provided the largest portion of the SIL System supply from
2 winter 1998/1999 to summer 2008. Over the first nine years of that period, the
3 TransCanada/GLGT system provided nearly all of the summer supply to Union's SIL System.

4
5 Starting in winter 2008/2009 there was a fundamental change in source of supply for the SIL
6 System. Since winter 2008/2009, the Vector Pipeline system has supplied more natural gas to
7 the SIL System than the TransCanada/GLGT system. In fact, from 2011 to 2014, the Vector
8 Pipeline system has provided over half of all summer supply to Union's SIL System. In summer
9 2014, the Vector Pipeline system provided nearly all of the supply to the SIL System.¹⁴

10
11 Supply from the BGS and MichCon systems to the SIL System has varied over the past sixteen
12 years (1998 to 2014). From winter 1998/1999 to winter 2005/2006, BGS provided very little
13 supply to the SIL System however, in other years flow on the BGS system tended to be much
14 greater in the winter than in the summer. MichCon flow over the past sixteen years also tended
15 to be greater in the winter than in the summer, however winter supply via the MichCon system to
16 the SIL System was very low in 1998/1999, 2006/2007 and 2009/2010.

17
18 Historically, the NPS 10 Payne Kimball Line has been used to supply the SIL System only when
19 supply from all other sources is not sufficient to meet the SIL System demand. In the 1990s, the
20 NPS10 Payne Kimball Line provided security of supply for much of the SIL System demand.

¹⁴ In addition to supplying the SIL System, the Vector Pipeline is the primary source of supply for two firm storage and transportation contracts for service west of Dawn. These contracts include firm Dawn to Dawn(Vector) transportation service of 93 TJ/d for Greenfield Energy Centre L.P. and firm Dawn to Dawn(TCPL) transportation service of 500 TJ/d for TransCanada (collectively the "S&T Contracts"). Supply via the TransCanada/GLGT, MichCon and BGS systems does not facilitate the S&T Contracts. If Vector Pipeline flow into Dawn is lower than the scheduled Dawn to Dawn (TCPL) and Dawn to Dawn (Vector) service, the S&T Contracts can also be supplied through Dawn compression or from other pipeline quality supply delivered to Dawn at suitable pressure.

- 1 With the growth of the Sarnia market, the ability of the NPS 10 Payne Kimball Line to provide
- 2 security of supply has diminished. This was not a significant concern in the past given relatively
- 3 robust flows from Michigan to Ontario.

SARNIA MARKET DEMAND GROWTH

This section of the evidence addresses firm in-franchise demand growth on the SIL System.

The Sarnia market has grown significantly since 1998 largely driven by industrial and power generation demand (see Figure 2-2). Market growth continues as Union has received new requests for firm T2 Storage and Transportation Carriage Service, commencing between November 1, 2013 and November 1, 2015. Union also expects further requests for firm service on the SIL System post 2015.

As discussed further in Section 5, Union does not have sufficient capacity available on the SIL System to meet the recent requests for incremental firm T2 Storage and Transportation Carriage Service.

Natural gas has become a strategic advantage for Ontario industry. Natural gas prices in North America are among the lowest in the world, and growing natural gas reserves will ensure that this remains the case for more than one hundred years¹⁵. Affordable commodity prices are bringing energy intensive industries back to North America and Ontario¹⁶.

¹⁵ Goldman Sachs – North American Energy Remakes the Geo political Landscape: Understanding and Advancing the Phenomenon – May 2014 - <http://www.goldmansachs.com/our-thinking/our-conferences/north-american-energy-summit/reports/mos-north-america-energy-remakes-the-geopolitical-landscape.pdf>

¹⁶ Price Waterhouse Coopers - Shale Gas, Reshaping the US Chemicals Industry – Oct 2012 - http://www.pwc.com/en_US/us/industrial-products/publications/assets/pwc-shale-gas-chemicals-industry-potential.pdf

1 Industry in North America and in particular the petrochemical industry (which is the core
2 industry in Sarnia-Lambton) is growing in response to the availability of North America's
3 abundant and affordable natural gas resources¹⁷. Union has received interest in significant
4 incremental natural gas delivery services from existing industrial customers and prospective new
5 market entrants that are considering investments in the Sarnia-Lambton region. Recently, Union
6 has contracted new, firm natural gas delivery services with Nova Chemicals (Canada) Ltd.
7 ("NOVA") and Shell Canada Limited ("Shell Canada"), totaling 1,392,000 m³/d or 53,300 GJ/d.

9 **NOVA**

10 NOVA operates three large chemical manufacturing facilities in the Sarnia area attached to the
11 SIL System. NOVA is also a participant in the Sarnia Regional Cogeneration Plant ("SRCP")
12 which is connected to the SIL System. As a participant in SRCP, NOVA supplies natural gas to
13 the SRCP and receives steam and electricity in return from TransAlta Corporation. NOVA has
14 an existing T2 Storage and Transportation Carriage Service Contract under which Union
15 provides natural gas service to NOVA at all four sites attached to the SIL System. NOVA has
16 contracted for increased levels of firm T2 Storage and Transportation Carriage Service from
17 Union at all four of their Sarnia sites with start dates between 2013 and 2015.

18
19 NOVA's Corunna site is a world scale petrochemical complex that produces about 1.8 billion
20 pounds of ethylene and up to 2.0 billion pounds of co-products annually. The Corunna facility
21 started up in late 1977 and was purchased by NOVA in 1988. It was the first fully integrated
22 refinery and petrochemical complex in North America. In 2011, NOVA launched a multi-

¹⁷ Accenture - Managing Capital Projects for Growth in the North American Petrochemical Industry – 2014 -
<http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-Managing-Capital-Projects-Growth-North-American-Petrochemical-Industry.pdf>

1 million dollar investment to upgrade its processes and change its Corunna site feedstock from a
2 mix of crude-oil based liquids to natural gas liquids (primarily ethane with lesser amounts of
3 propane and butane). In December 2013, the Corunna site began to consume ethane sourced
4 directly from the Marcellus shale formation.

5
6 NOVA's elimination of their crude-oil based liquid feedstock at the Corunna site also drove the
7 need for NOVA to convert several large process boilers from crude-oil based fuel to natural gas.
8 This fuel conversion is largely underpinning NOVA's requirement for incremental firm natural
9 gas supply at their Corunna facility. The Corunna site will utilize over 90% of NOVA's new
10 firm T2 Storage and Transportation Carriage Service which is incremental to existing demand
11 and commences in stages between November 1, 2013 and November 1, 2015. This represents an
12 increase of four to five times above NOVA's pre-conversion natural gas requirements at this site.

13
14 NOVA's Moore plant converts ethylene into polyethylene resins. This facility has been
15 operating since 1977. Ethylene feedstock arrives at the Moore site via pipeline from NOVA's
16 Corunna site. The facility has a rated capacity of about 840 million pounds of polyethylene per
17 year. The change in feedstock and operating capabilities at NOVA's Corunna site has also
18 positively impacted NOVA's Moore site natural gas requirements for large process boilers. The
19 Moore site will utilize a small portion of NOVA's new firm T2 Storage and Transportation
20 Carriage Service, which is incremental to existing demand and will commence November 1,
21 2014.

22
23 NOVA's St. Clair River site has the capacity to produce 395 million pounds, or 180 kilotonnes,
24 of polyethylene per year. Liquid ethylene feedstock is transported to the St. Clair River site via

1 pipeline from NOVA's Corunna site and is used in the production of approximately forty
2 different grades of polyethylene resins. Similar to NOVA's Moore site, changes in feedstock
3 and operating capabilities at NOVA's Corunna site have also positively impacted the natural gas
4 requirements for large process boilers at NOVA's St. Clair River site. The St. Clair River site
5 will utilize a small portion of the new firm T2 Storage and Transportation Carriage Service,
6 which is incremental to existing demand and will commence November 1, 2014.

7
8 NOVA's requirement for steam from SRCP has also increased. NOVA has requested that Union
9 replace existing interruptible services with firm T2 Storage and Transportation Carriage Service
10 to the SRCP delivery point. The SRCP site will utilize a small portion of the new NOVA firm
11 demand in stages between January 1, 2014, and November 1, 2014.

12
13 A redacted copy of NOVA's T2 Storage and Transportation Carriage Service contract can be
14 found at Schedule 3-1.

15 16 **Shell Canada**

17 Shell Canada is one of the largest integrated oil and gas companies in Canada. Headquartered in
18 Calgary, Alberta, Shell Canada manufactures and markets a range of products, including fuels,
19 lubricants, bitumen and liquefied petroleum gas for home, transport and industrial use. Shell
20 Canada has two refineries in Canada (Scotford, Alberta and Township of St. Clair, Ontario) and
21 three chemical plants. Shell Canada's St. Clair refinery site (built in 1952) is located in the
22 Township of St. Clair and, similar to NOVA, Shell Canada receives natural gas service from
23 Union's SIL System.

1 Shell Canada's refinery boilers currently burn heavy fuel oil and Shell Canada is planning to
2 convert these heavy fuel oil boilers to natural gas. Shell Canada is commencing conversion work
3 on the first heavy fuel oil boiler in 2014, and the second heavy fuel oil boiler in 2015. The Shell
4 Canada's requirements will commence in stages between late 2014 and mid 2015.

5
6 A redacted copy of Shell's T2 Storage and Transportation Carriage Service contract can be found
7 at Schedule 3-2.

8 9 **Other Potential Natural Gas Demand**

10 In addition to NOVA and Shell Canada, Union has met with other potential industrial customers
11 that may be interested in investing in the Sarnia-Lambton area. Sarnia-Lambton's existing
12 petrochemical complex and its access to natural gas supply and services at the Dawn Hub helps
13 Sarnia-Lambton compete with other North American and global jurisdictions for jobs and
14 industrial investment. These strategic advantages are underpinning recent interest from both
15 existing industrial customers and potential industrial customers considering new investment
16 opportunities in the Sarnia-Lambton area.

17
18 Significant amounts of both electricity and steam are typically required in the manufacturing
19 processes in the petrochemical sector where energy costs are a major component of the total cost
20 of production. Natural gas is the primary fuel used in the production of steam and electricity,
21 and it is typically a primary cost driver. Access to abundant, high pressure, low cost natural gas
22 is a key element in the decision to expand existing facilities or site new petrochemical plants.

Union expects that there will be an increase in demand from industrial customers for natural gas delivery services on the SIL System. This potential increase in demand for natural gas in the Sarnia-Lambton area is associated with investment in new and existing petrochemical-based industrial facilities and potential large volume end-use applications such as gas-fired generation and cogeneration. Union estimates that approximately 1,800,000 m³/d, or approximately 70,000 GJ/d, of new natural gas service demand is possible on the SIL System in addition to the NOVA and Shell Canada demand described earlier. Directionally about 30% of those potential new natural gas demands are expected to commence between 2016 and 2018 with the remaining 70% expected to commence in the 2019/2020 timeframe. Access to abundant, competitively priced natural gas is a major factor underpinning local economic development efforts to attract petrochemical investment in the Sarnia-Lambton area.

Summary

NOVA and Shell Canada have requested new firm T2 Storage and Transportation Carriage Service totaling 1,392,000 m³/d or 53,300 GJ/d, commencing in stages between November 1, 2013 and November 1, 2015. These new service requests increase design day demand beyond existing capacity, requiring an immediate expansion of the SIL System. Expansion facilities designed for the SIL System will also need to consider the estimated incremental T2 Storage and Transportation Carriage Service demand of nearly 70,000 GJ/d that is expected to be requested between 2015 and 2019. The proposed Pipeline (see Section 5) will provide the necessary capacity to meet the demands identified above.

SUPPLY RISK

This section of evidence will address the increasing supply risk for the SIL System and the need for security of supply.

Recent changes to the natural gas supply and transportation dynamics in North America have impacted traditional flow patterns from western producing regions to eastern markets, and have altered the relative price of natural gas between trading points across North America. The result has been a trend of decreasing flow into Dawn through Michigan.

At the same time, Union has experienced fundamental changes on its Dawn Parkway System including:

- i. a drastic reduction of deliveries from the Dawn Parkway System into the TransCanada Mainline at Kirkwall to serve U.S. Northeast customers;
- ii. receipt of natural gas from the TransCanada Mainline at Kirkwall to transport imported Marcellus shale production to Canadian markets via the Dawn Parkway System¹⁸; and
- iii. a return to the receipt of natural gas from the TransCanada Mainline at Parkway in the summer of 2014 for transportation on the Dawn Parkway System to fill Dawn storage¹⁹.

A summary of Union's forecast 2015/2016 SIL System design day demands as well as the amount of controlled long-term supply for the SIL System is provided in Table 4-1.

¹⁸ Natural gas has been imported at Niagara since 2012 as discussed in further detail in EB-2013-0074, Pre-Filed Evidence, Section 6 and EB-2014-0261, Exhibit A, Tab 6.

¹⁹ Changing flow patterns in the summer of 2014 on the Dawn Parkway System is discussed in further detail in EB-2014-0261, Exhibit A, Tab 6.

Table 4-1
SIL System
Design Day Demands and Controlled Long-Term Supply
(TJ/d)

	Winter 2015/2016		Summer 2016	
	Demand	Supply	Demand	Supply
Firm ²⁰	1,090	260	1,016	185
Interruptible	164	0	204	0
Total	1,254	260	1,220	185

Union controls approximately 21% of the supply to meet forecast 2015/2016 design day demands for the SIL System and the S&T Contracts²¹ in the winter and approximately 15% in the summer. Union controls supply either through long-term firm transportation capacity contracted on the third-party interconnecting pipelines or by using its own storage and transportation facilities. The greatest difference between demand and long-term controlled supply is during the summer months. Considering only the forecast 2015/2016 SIL System demand²², Union controls approximately 39% of the supply to meet design day demand in the winter and approximately 30% in the summer.

Recently, Union announced its intention to contract for 158 TJ/d of firm transportation capacity on the NEXUS pipeline to Dawn. Assuming that this natural gas is delivered through one of the third-party pipelines connected to the SIL System, Union would control approximately 33% of

²⁰ Controlled firm supply includes capacity available through Union's facilities (including the NPS10 Payne Kimball Line) and Vector Pipeline.

²¹ Table 4-1 includes demands on the SIL System and to serve the S&T Contracts.

²² The SIL System design day demand in Table 4-1 can be derived by subtracting 593 TJ/d from the Total. The forecast 2015/2016 design day demands for the SIL System are 661 TJ/d (winter) and 627 TJ/d summer.

1 the forecast 2015/2016 design day demand for the SIL System and the S&T Contracts in the
2 winter and approximately 28% in the summer. Considering only forecast 2015/2016 SIL System
3 demand, Union would control approximately 63% of the winter design day demand and 55% in
4 the summer. Therefore, even with NEXUS pipeline supply available to the SIL System, Union
5 would only control enough supply to meet about 60% of the SIL System forecast 2015/2016
6 design day demand and about one-third of the design day demand of the SIL System and S&T
7 Contracts. As the Sarnia market continues to grow, the relative amount of long-term controlled
8 supply will decrease²³.

9
10 The degree to which Union controls supply to serve the SIL System and the S&T Contracts
11 concerns Union. Union's concerns with respect to supply risk are summarized as follows:

- 12 • The changing North American supply and transportation dynamics have materially
13 impacted natural gas flow into Dawn, particularly natural gas originating in the
14 WCSB.
- 15 • Flow on the TransCanada/GLGT system has significantly decreased into Dawn and,
16 starting in 2011, Union has delivered natural gas into the TransCanada system at
17 Dawn, reversing the flow on the GLGT system. The amount of natural gas available
18 for delivery into the SIL System from the TransCanada system has decreased and
19 become less reliable.
- 20 • Fundamental changes on the Dawn Parkway System have resulted in the receipt of
21 natural gas from the TransCanada Mainline at Kirkwall, reversing the flow of

²³ For instance, Union controls approximately 15-20% of the forecast 2019/2020 design day demand for the SIL System and S&T Contracts and approximately 25-35% of the forecast 2019/2020 design day demand for only the SIL System. With NEXUS pipeline capacity, Union controls approximately 25-30% of the forecast 2019/2020 design day demand for the SIL System and S&T Contracts and approximately 50-55% of the forecast 2019/2020 design day demand for only the SIL System.

1 TransCanada's Niagara to Kirkwall pipeline section. As well, summer 2014 included
2 a return to the net receipt of natural gas from the TransCanada Mainline at Parkway to
3 fill storage at Dawn, which hadn't occurred since 2009.

- 4 • Flow from Michigan on the MichCon and BGS systems to Ontario is typically very
5 low in the summer months and therefore less dependable when the difference between
6 Union's long-term controlled supply and market demand is the greatest. In addition,
7 over the past sixteen years, supply from the MichCon system and the BGS system to
8 Union's system has been very low or non-existent in multiple winters. Supply to the
9 SIL System from the MichCon and BGS systems cannot be considered sustainable or
10 reliable.
- 11 • Since winter 2008/2009, the majority of the supply for the SIL System has been
12 provided through the Vector Pipeline system. In winter of 2013/2014 and in the
13 summer of 2014, seasonal average flow from the Vector Pipeline system to Union's
14 system was the lowest experienced in the past six years. On a number of days since
15 the beginning of 2014, flow to Union's system via the Vector Pipeline system has
16 been much less than the design day demand of the SIL System with the lowest daily
17 delivery being 387 TJ/d (approximately 60% of the forecast 2015/2016 design day
18 demand).
- 19 • The market value of transportation in the summer months, in particular, between
20 Dawn and receipt points west of Dawn, such as Chicago, Emerson and MichCon,
21 decreased. More recently, on an increased number of days, the market value of
22 transportation does not support flow from these receipt points to Dawn.

- In 2013/2014, on certain days, flow from the four third-party interconnecting pipelines on a combined basis was less than the forecast 2015/2016 and forecast 2019/2020 SIL System forecasted design day demand.

Supply risks for each of the four third-party interconnecting pipelines are discussed in more detail below.

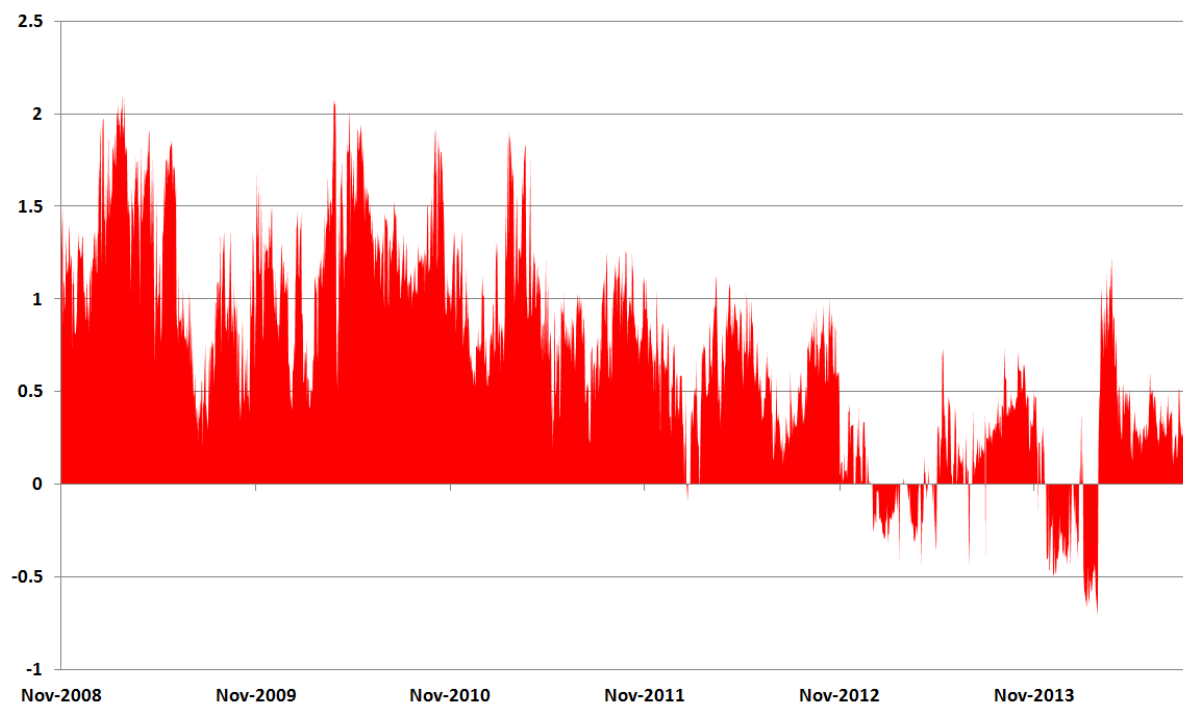
Reduced TransCanada/GLGT System Flows

The long term decrease in Empress send-out on the TransCanada Mainline has impacted flow on the GLGT system. Daily deliveries on the GLGT path to Union's system averaged 1.2 PJ/d from November 1, 2003 to October 31, 2009 with a peak delivery of approximately 2 PJ/d. From November 1, 2009 to October 31, 2012, net daily deliveries to Union's system decreased by approximately 25% to 0.92 PJ/d on average. Starting November 1, 2010, TransCanada contracted with Union to provide a service that would flow natural gas from Dawn to the TransCanada Mainline (St. Clair to Dawn segment). Union's Dawn to Dawn (TCPL) transportation service supports reversal of flow on the TransCanada and GLGT systems²⁴. This represents a fundamental change in natural gas flows in Ontario and the U.S. Midwest, and specifically flows between Michigan and Ontario.

Daily deliveries from 2008 to 2014 on Union's system to and from the GLGT path (via TransCanada) are shown in Figure 4-1.

²⁴ To flow natural gas from Dawn to Emerson, natural gas first flows from Dawn into the TransCanada Mainline. TransCanada then transports the natural gas to the GLGT system at an interconnection under the St. Clair River. GLGT then transports the natural gas to Emerson where the GLGT system interconnects with the TransCanada Mainline. This is the initial portion of the path between Dawn and TransCanada's Eastern Ontario Triangle that is often referred to as "Around the Horn". First Dawn to Dawn (TCPL) flows occurred in 2011.

Figure 4-1
Net Daily TransCanada/GLGT Flows to Union's System 2008-2014
(PJ/d)



More recently, from November 1, 2012 to October 31, 2013, net daily deliveries of natural gas on the TransCanada/GLGT system continued to decline to an average of 0.13 PJ/d into Union's system, which is approximately 10% of the 2003 to 2009 average daily deliveries to Union's system. This is a significant decline in flow on a pipeline that once provided nearly all of the natural gas supply for the SIL System. From November 1, 2012 to October 31, 2013, Union delivered natural gas into the GLGT system via the TransCanada system on 93 days, or 25% of the time.

Net daily deliveries for the partial gas year post November 1, 2013 (to August 31, 2014) were similar to the previous year averaging 0.16 PJ/d into Dawn with 86 days, or 28% of the time, where Union delivered natural gas into the GLGT system (via the TransCanada system).

Net annual and seasonal deliveries from 2008 to 2014 at Dawn to and from the TransCanada/GLGT path are summarized in Table 4-2.

Table 4-2
Average Net Annual and Seasonal TransCanada/GLGT Deliveries to Union's System
2008-2014

Annual Average Daily Supply (PJ/d)					
2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
1.16	1.24	0.93	0.59	0.13	0.16
Winter Average Daily Supply (PJ/d)					
2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
1.42	1.09	1.05	0.57	-0.03	-0.01
Summer Average Daily Supply (PJ/d)					
2009	2010	2011	2012	2013	2014
0.98	1.35	0.84	0.61	0.24	0.34

The decline in flow through the TransCanada/GLGT system to Dawn is also reflective of the firm contracts held by TransCanada on the GLGT system for Emerson to Dawn transportation capacity. TransCanada held firm transportation capacity on the GLGT system to facilitate transportation services between Empress and eastern markets, including Dawn. Between January and October of 2010, TransCanada contracted for slightly less than 1.4 PJ/d of firm, transportation capacity on the Emerson to Dawn path on the GLGT system. Today,

TransCanada contracts for 106 TJ/d of firm transportation capacity on the Emerson to Dawn path²⁵.

As discussed in Section 2, when flow reverses on the TransCanada/GLGT system (i.e. flow from Dawn to Emerson), Union cannot direct supply from the TransCanada system into the SIL System at Courtright. Reverse flow on the TransCanada/GLGT system occurred approximately 25% of the time over the past two years.

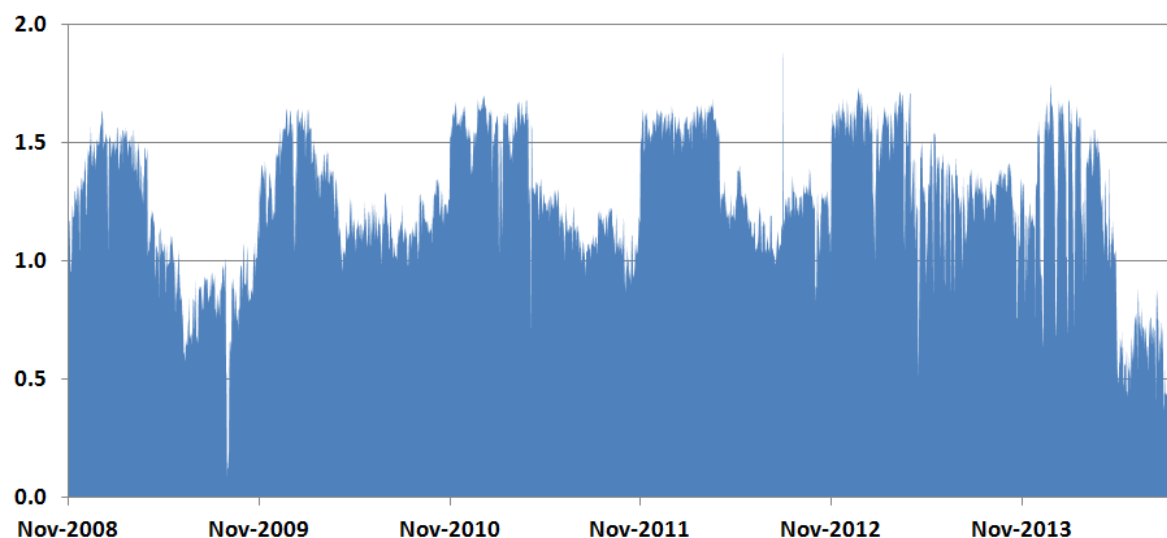
Based on the declining flows to Dawn and the reversal of flow on the TransCanada/GLGT system, Union no longer relies on the TransCanada/GLGT system to provide a large amount of the supply for the SIL System. Since the winter of 2008/2009, Union has relied less and less on the TransCanada/GLGT system to meet demand in the SIL System.

Inconsistent Vector Flow

From November 1, 2004 to October 31, 2009, Vector Pipeline system flows into Union's system averaged more than 0.8 PJ/d, reaching a maximum flow rate of more than 1.6 PJ/d. From November 1, 2010 to October 31, 2013, the average flows from the Vector Pipeline system into Union's system increased almost 50% to an average of 1.4 PJ/d, reaching a maximum flow rate of approximately 1.9 PJ/d. Daily Vector Pipeline system deliveries into Union's system are shown in Figure 4-2.

²⁵ Sources: <http://www.glt.com/infopostings/ebbmain.asp> and TransCanada PipeLines Limited Business and Services Restructuring and Mainline 2012 – 2013 Tolls Application, RH-003-2011 October 31 2011, Part E: Mainline 2012-2013 Revenue Requirement, Attachment 12.1: Revenue Requirement, Tab 2 – Transportation by Others, Page 11, Table 3.

Figure 4-2
Daily Vector Pipeline Deliveries to Union's System 2008-2014
(PJ/d)



From November 1, 2013 to August 31, 2014, however, flow from the Vector Pipeline system into Union's system has seen a decline, averaging 1.03 PJ/d. Average deliveries into Union's system during the winter period were approximately 1.35 PJ/d, which was the lowest level since prior to 2008. Summer flows into Union's system (April 1, 2014 to August 31, 2014) from the Vector Pipeline system have decreased by approximately 0.5 PJ/d on average, or a decrease in the range of 35-40%, from the previous four summer seasons (from 1.19 PJ/d to 0.72 PJ/d).

Annual and seasonal average flow from the Vector Pipeline system into Union's system since 2008 is shown in Table 4-3.

Table 4-3
Annual and Seasonal Average Vector Flows to Union's System 2008-2014

Annual Average Daily Supply (PJ/d)					
2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
1.10	1.26	1.31	1.36	1.39	1.03
Winter Average Daily Supply (PJ/d)					
2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
1.41	1.42	1.56	1.58	1.57	1.35
Summer Average Daily Supply (PJ/d)					
2009	2010	2011	2012	2013	2014
0.88	1.15	1.14	1.20	1.27	0.72

Since the winter of 2008/2009, Union has relied on the Vector Pipeline system to supply a large portion of the SIL System demand. From 2011 to 2014, the Vector Pipeline system provided over half of the summer supply to meet SIL System demand (see Section 2).

Since the beginning of 2014, deliveries from the Vector Pipeline system to Union's system were less than the forecast 2015/2016 design day demand of the SIL System of 661 TJ/d on 74 days (approximately 30% of the time)²⁶. The lowest daily delivery from the Vector Pipeline system to Union's system was 387 TJ/d, or approximately 60% of the forecast 2015/2016 design day demand²⁷.

Competing with Dawn for Vector supply is the Michigan market and roughly 675 Bcf of underground natural gas storage in Michigan. Further tightening of supply into the Vector

²⁶ Since the beginning of 2014, Vector Pipeline deliveries to Union's system were less than the firm component of the forecast 2015/2016 design day demand of 497 TJ/d on 18 days (7% of the time).

²⁷ 387 TJ/d of deliveries to Union's system on Vector Pipeline is approximately 55% of the forecast 2019/2020 design day demand.

Pipeline system at Chicago in 2014 and 2015 may occur due to an expected decline in WCSB deliveries via the Alliance Pipeline.

In the Alliance Pipeline application to the FERC for approval of new services and related tolls and tariffs, Alliance Pipeline states:

“In 2010, the majority of Pipeline shippers declined to exercise their renewal rights under the transportation contracts. As a result, effective 1 December 2015, approximately 92% of previously contracted capacity will become available to the market.”²⁸

As a result, the contracting profile on Alliance Pipeline in winter 2015/2016 is unclear.

A number of pipeline projects have been announced that could provide new sources of supply bringing Marcellus and Utica production to replace declining WCSB supply. As discussed previously, Union has recently announced its intention to contract for 158 TJ/d of NEXUS pipeline capacity to Dawn.

Union is concerned about the trend of declining flow into Union’s system from the Vector Pipeline system, particularly given the recent reliance on the Vector Pipeline system to supply the SIL System and the S&T Contracts.

Unpredictable MichCon Flows

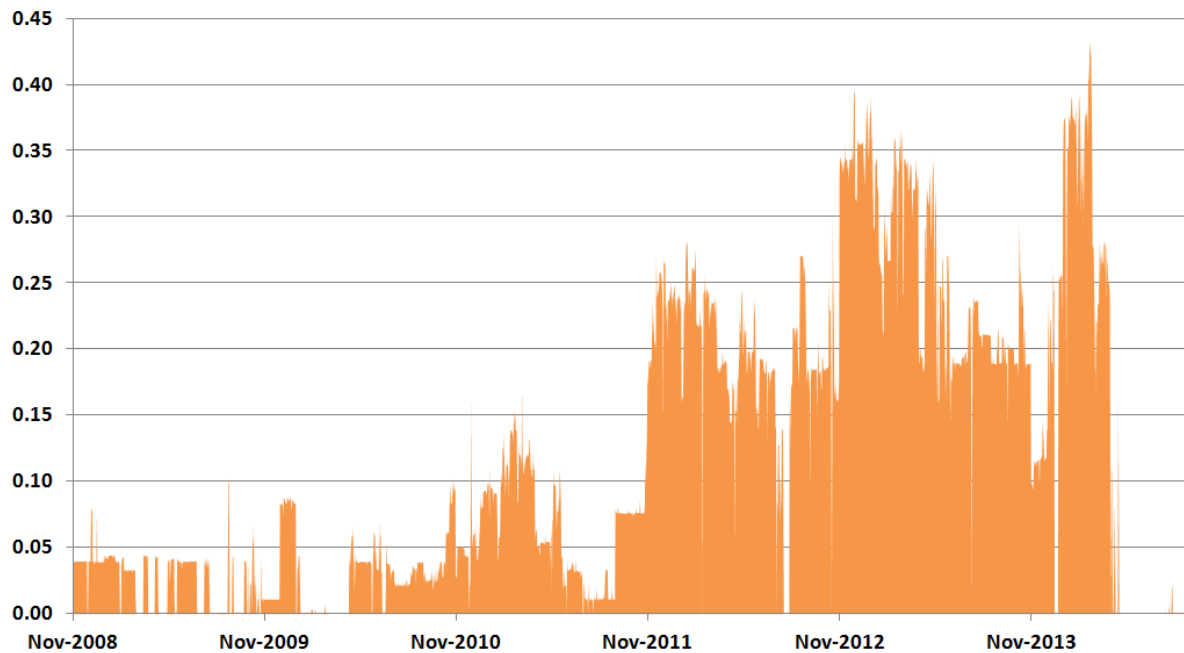
Deliveries from Michigan to Ontario via the MichCon system are influenced by the market value of transportation between MichCon and Dawn. As a result, flow can fluctuate year-to-year,

²⁸ RH-002-2014 Application for New Services and Related Tolls and Tariffs for Service on the Alliance Pipeline

season-to-season and day-to-day. The SIL System accesses supply via the MichCon system at Union's St. Clair Line Station, which has a rated capacity of 0.16 PJ/d.

Daily flow from the MichCon system to Union's system is shown in Figure 4-3.

Figure 4-3
Daily MichCon Flows to Union's System 2008-2014
(PJ/d)



Over the five year period from November 1, 2008 to October 31, 2013 average daily flow from the MichCon system to Union's system significantly increased from 0.02 PJ/d in 2008/2009 to 0.26 PJ/d in 2012/2013. Summer and winter average flow from November 1, 2008 to October 31, 2011 was roughly the same. However, from November 1, 2012 to October 31, 2013 average daily flow in the summer was 40% less than average daily flow in the winter.

For the partial year post November 1, 2013, average daily winter deliveries from the MichCon system to Union's system remained relatively high; however, average daily flow from April 1, 2014 to August 31, 2014 (partial summer) was nearly zero. The relationship between the market value of transportation and flow on the MichCon system to Ontario is discussed further in Schedule 4-1.

Annual and seasonal average deliveries from the MichCon system to Union's system are summarized in Table 4-4.

Table 4-4
Annual and Seasonal Average MichCon Flow Available to Union's System
2008-2014

Annual Average Daily Supply (PJ/d)					
2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
0.02	0.03	0.06	0.19	0.26	0.13
Winter Average Daily Supply (PJ/d)					
2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
0.03	0.02	0.09	0.22	0.33	0.25
Summer Average Daily Supply (PJ/d)					
2009	2010	2011	2012	2013	2014
0.02	0.03	0.05	0.17	0.20	0.01

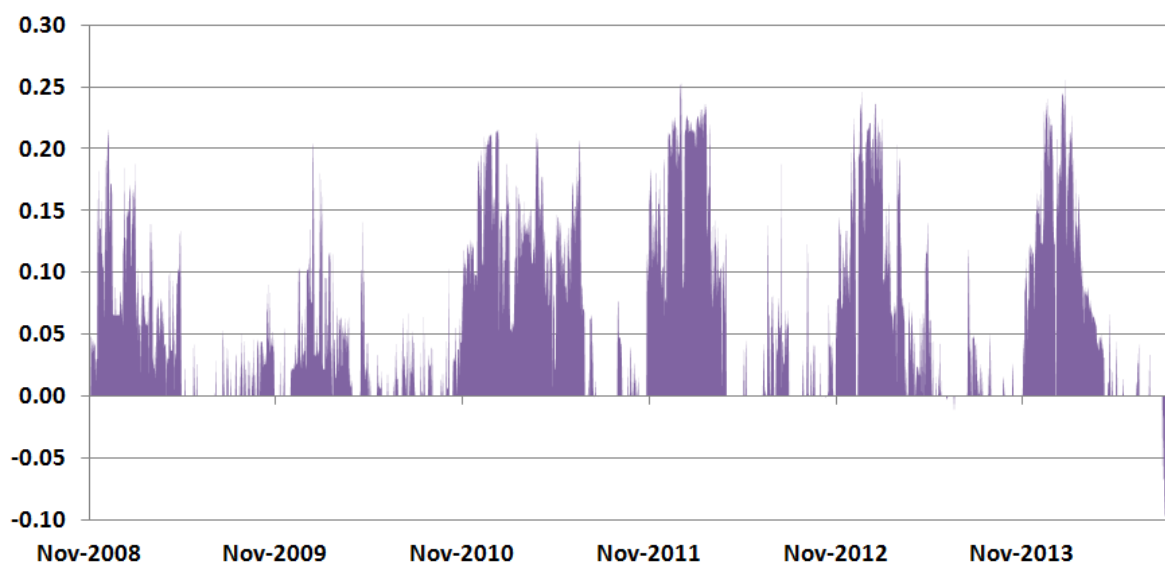
Union is concerned with the significant decline in MichCon flow to Ontario in summer 2014. Supply to the SIL System via the MichCon system cannot be considered sustainable or reliable given the variability in the amount of natural gas flowing on the MichCon system from Michigan to Union's system.

Changing BGS Flows

Deliveries from Michigan to Ontario via the BGS system are influenced by the contractual arrangements for BGS services and the market value of transportation between Michigan and Dawn. As a result, flow can fluctuate year-to-year, season-to-season and day-to-day. Union receipts at Bluewater (from the BGS system) are limited to approximately 0.3 PJ/d. BGS holds a firm, winter-only Bluewater to Dawn transportation contract for 123 TJ/d.

Daily flow from the BGS system to Union's system is shown in Figure 4-4.

Figure 4-4
Daily BGS Flows to Union's System 2008-2014
(PJ/d)



Over the six year period from November 1, 2008 to August 31, 2014, average daily flow on an annual basis, from the BGS system to Union's system ranged from 0.03 PJ/d to 0.09 PJ/d. In the past four winters, average flows were relatively stable, ranging between 0.13 PJ/d and 0.17 PJ/d. Average summer flow however from the BGS system into Union's system has been much lower than average winter flow. Average daily summer flow has been less than 0.02 PJ/d with the

exception of 2010/2011. The relationship between the market value of transportation and flow on the BGS system to Ontario is discussed further in Schedule 4-1.

During the summer of 2014, BGS experienced a failure at its storage compressor plant and an outage at a key interconnect within Michigan. This limited the ability of the BGS system to deliver natural gas into the SIL System. In summer 2014, when operating conditions allowed, Union delivered natural gas into the BGS system from the SIL System.

Annual and seasonal average deliveries from the BGS system to Union's system are summarized in Table 4-5.

Table 4-5
Annual and Seasonal Average BGS Flow Available to Union's System
2008-2014

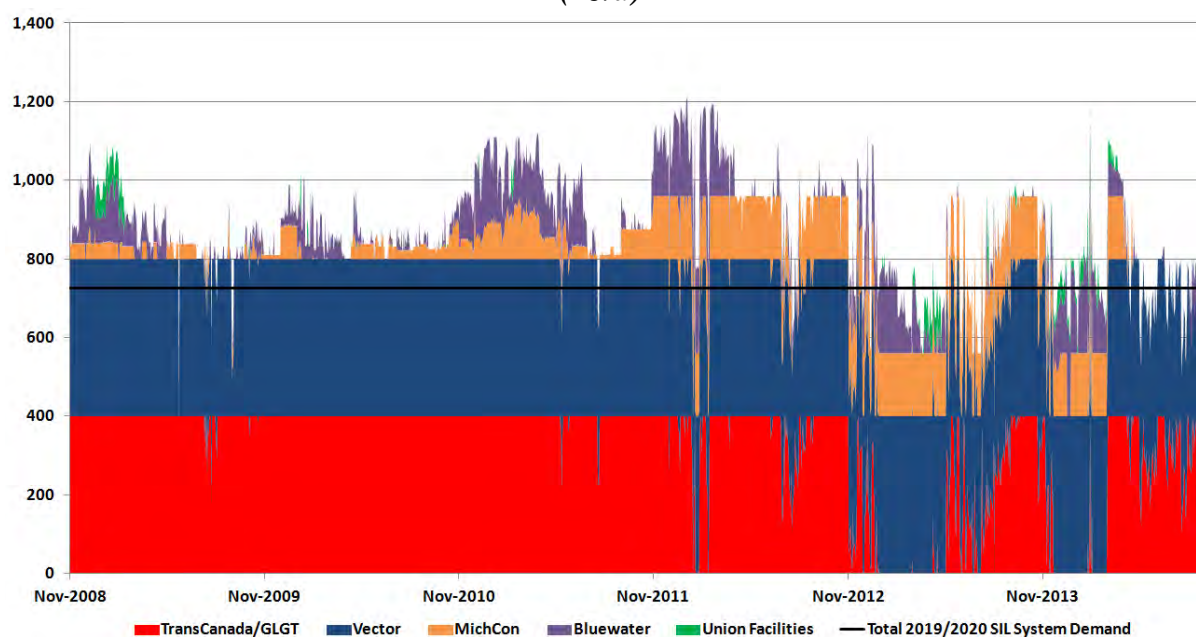
Annual Average Daily Supply (PJ/d)					
2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
0.05	0.03	0.09	0.08	0.06	0.06
Winter Average Daily Supply (PJ/d)					
2008/2009	2009/2010	2010/2011	2011/2012	2012/2013	2013/2014
0.09	0.05	0.14	0.17	0.13	0.13
Summer Average Daily Supply (PJ/d)					
2009	2010	2011	2012	2013	2014
0.02	0.01	0.06	0.01	0.01	-0.01

BGS system flow to supply the SIL System over the previous six summers has not been reliable, resulting in increased dependency on Vector Pipeline system supply and contributing to Union's supply risk concern for the SIL System. Supply to the SIL System via the BGS system cannot be considered sustainable or reliable given the variability in the amount of natural gas flowing on the BGS system from Michigan to Union's system.

Combined Flows

Figure 4-5 shows daily supply available to serve the SIL System since 2008. The graph shows actual deliveries available into the SIL System from the Vector Pipeline, TransCanada/GLGT, MichCon and BGS systems as well as Union's own facilities²⁹.

Figure 4-5
Historical Supply Available to Serve SIL System Demand
(TJ/d)



When compared to the forecast design day demand effective winter 2015/2016, there were 94 days, or 5% of the time, where available supply would have been insufficient to meet SIL System design day demand during the five year period from November 1, 2008 to October 31, 2013. For the partial year post November 1, 2013 (to August 31, 2014), there were 69 days, or 22% of the time, where available supply would have been insufficient to meet winter 2015/2016

²⁹ Supply available to the SIL System means the lesser of i) actual flow on each of the third-party interconnecting pipelines or ii) the capacity of each connection with the SIL System. For instance, if the Vector Pipeline flow into Union's system was 1 PJ/d on a given day then the supply available to the SIL System would be limited to the interconnection capacity of 0.4 PJ/d. Also, if the Vector Pipeline flow into Union's system on a given day was 387 TJ/d then the supply available to the SIL System was 387 TJ/d (i.e. less than the interconnection capacity).

SIL System forecast design day demand. Further, when compared to the forecast 2019/2020 design day demand³⁰, there were 134 days, or 44% of the time, since November 1, 2013 where supply would have been insufficient to meet SIL System design day demand³¹.

Sussex Market and Risk Assessment

Union engaged Sussex Economic Advisors, LLC (“Sussex”) to analyze market dynamics as it relates to supply of natural gas for the SIL System. The Sussex report entitled “*Union Gas Sarnia Industrial Line Market Analysis*” (the “Report”) is included as Schedule 4-1.

In its Report, Sussex observed and concluded that:

- To serve the Supply Requirement, Union relies on natural gas flows to Dawn on the Upstream Pipelines.
- The Upstream Pipelines currently access natural gas supply from the WCSB and other natural gas production basins that are facing increased competition from natural gas produced in the Marcellus and Utica shale basins.
- There is increased demand for WCSB gas in Alberta from the oil sands and electric power generation segments, which has resulted in less natural gas supply available for eastern markets (e.g., Ontario) and reduced flows on the Upstream Pipelines.
- The Sussex basis differential analysis identified certain days when the price spread between locations on the Upstream Pipelines and the Dawn Hub were equal to or less than zero (i.e., inverted basis differentials), thus providing an incentive to either not deliver natural gas to Dawn or transport natural gas to other markets (e.g. Michigan or Chicago).

³⁰ As further discussed in Section 5, 2019/2020 is the planning horizon to evaluate project alternatives to serve both growth in demand and security of supply.

³¹ Between November 1, 2008 and October 31, 2013, there were 164 days where supply was less than the forecast design day demand effective winter 2019/2020.

- 1 • The number of days observed with inverted basis on the Upstream Pipelines has
2 increased significantly, which, if that trend continues, could reduce the incentive to flow
3 gas to the Dawn Hub.
- 4 • The Sussex flow analysis reviewed the flows on each of the Upstream Pipelines and
5 compared that volume to the Design Day Demand and the Supply Requirement. In
6 addition, Sussex analyzed the Upstream Pipeline flows in aggregate relative to the Design
7 Day Demand and the Supply Requirement. Finally, Sussex reviewed the Upstream
8 Pipeline flows on days with inverted basis differentials. The results of these analyses
9 illustrate that flows on the Upstream Pipelines have declined and become more volatile,
10 which may affect the ability of Union to meet the Design Day Demand and the Supply
11 Requirement.
- 12 • The short-term nature of the contracting practices on the Upstream Pipelines, coupled
13 with significant contract expirations over the coming years, decreases the predictability of
14 flows to Dawn and increases risk regarding Union's existing approach to meeting Design
15 Day Demand and the Supply Requirement.
- 16 • Finally, the inability of Union to predict or control the flow of natural gas to Dawn on the
17 Upstream Pipelines exacerbates the risk of meeting the Design Day Demand and the
18 Supply Requirement.

20 **Summary**

21 Union has significant concerns with respect to the risks associated with SIL System supply going
22 forward given:

- 23 • The decrease in flows through Michigan into Ontario (particularly on the
24 TransCanada/GLGT and Vector Pipeline systems);
- 25 • The large reliance on the Vector Pipeline system to provide supply to the SIL System.
- 26 • The lack of sustainable supply available to the SIL System from the MichCon and BGS
27 systems.

1 In order to ensure that Union can meet natural gas demand on the SIL System, Union requires
2 increased reliability and security of supply. Given that the increased demands on the SIL System
3 will require expansion facilities, as described in Section 5, Union has the opportunity to provide
4 incremental capacity and security of supply to the SIL System through a combined project. The
5 Proposed Pipeline (see Section 5) will provide the necessary capacity: i) to meet firm demand in
6 the Sarnia market in the event of low flow or an outage on one or more of the four third-party
7 interconnecting pipelines (security of supply); and ii) to meet the demand growth forecast in the
8 Sarnia market.

FACILITIES PLANNING

The purpose of this section of the evidence is to review the current design and operation of the SIL System and to discuss expansion and security of supply requirements. This section of evidence also reviews the physical and commercial alternatives to provide secure natural gas supply and meet the growing demand of the SIL System, and describes the proposed project.

This section of evidence is comprised of the following:

- 1- Existing Facilities
- 2- Design Day
- 3- Security of Supply Requirements
- 4- Alternatives Considered
- 5- Proposed Project

1- Existing Facilities

The backbone of the SIL System is the SIL. The SIL begins at Union's Courtright Station located in Lot 27, Concession 1, Township of St. Clair (formerly Township of Moore). From Courtright, it extends northerly and terminates within the limits of the City of Sarnia at the Sarnia Industrial Station, near the intersection of Churchill Road and Vidal Street South.

The original SIL consists of NPS 12 pipeline constructed in the 1960's, running easterly from Courtright for 0.9 kilometres and then northerly for approximately 17.5 kilometres, terminating at the Sarnia Industrial Station. The SIL also connects to Union's NPS 24 St. Clair Line via the St. Clair Line Station approximately 1.5 kilometres south of Courtright. The current SIL

1 includes subsequent looping with an NPS 16 pipeline from the Novacor Corunna Station to the
2 Dow Valve Site (1992), an NPS 20 pipeline from Courtright to the Novacor Corunna Station
3 (2002), and an NPS 20 pipeline from the Novacor Corunna Station to the Dow Valve Site
4 (2007). 91.7% of the SIL, by length, south of Lasalle Road has been looped (i.e. two parallel and
5 interconnected pipelines). The SIL System's major industrial customers are primarily served
6 directly from the SIL, whereas the residential and smaller commercial markets are served by
7 lower pressure pipelines fed from the SIL.

8
9 Other pipelines owned by Union that connect to the SIL System include:

- 10 • NPS 8 Kimball Line – connecting Dawn, via the Dawn Kimball Line, to a lower pressure
11 portion of the SIL System
- 12 • NPS 10 Payne Kimball Line – connecting the NPS 20 Payne Storage Line to the SIL
- 13 • NPS 10 Dow Storage Line – connecting the Dow A Pool to the SIL at the Dow Valve Site
- 14 • NPS 24 St. Clair Line – connecting the MichCon system to Dawn and to the SIL System at
15 the St. Clair Line Station.

16
17 The SIL System, as described in Section 2, directly interconnects with two third-party pipelines
18 at Courtright (the TransCanada/GLGT and Vector Pipeline systems); is connected to the BGS
19 system via St. Clair Pipelines L.P. (the Bluewater Pipeline); and is connected to the MichCon
20 system via the St Clair Line and St. Clair Pipelines L.P. system (St. Clair River Crossing) .

21
22 A schematic showing the existing SIL System can be found at Schedule 5-1.

1 The primary source of natural gas for the SIL System is at Courtright as discussed in more detail
2 in Sections 2 and 4. The NPS 10 Payne Kimball Line has historically been available to provide
3 security of supply for the SIL System however market growth has diminished its ability to meet
4 all of the security of supply requirements. Until recently, supply at Courtright for the SIL
5 System was reliable and relatively abundant. This is no longer the case, reflecting the trend of
6 decreasing flow between Michigan and Ontario.

8 ***2- Design Day***

9 The SIL System is designed to meet in-franchise demand on a design day. The SIL System is
10 unique in that the majority of its demand is not heat sensitive. Large industrial process loads are
11 not heat sensitive and are contracted for consumption throughout the year. These demands make
12 up over 90% of the SIL System design day demand. As a comparison, the current ratio of heat
13 sensitive to total design day demand for in-franchise customers connected to the Dawn to
14 Parkway System is 27%.

15
16 As discussed in Section 4, summer is also the period when Union receives the lowest amount of
17 supply from the four third-party interconnecting pipelines and the Dow A Pool is not available to
18 provide withdrawals (in fact it becomes a demand requiring injections). The summer represents
19 the most challenging conditions with respect to supply and demand balance on the SIL System.
20 Therefore, Union analyzed the facility needs of the SIL System based on a summer design day
21 demand.

1 The summer design day demand is the maximum expected daily demand on a zero Heating
2 Degree Day, which represents an average daily temperature of 18 degrees Celsius. The current
3 summer design day model for the SIL System includes the following assumptions:

- 4 1) All in-franchise customers are consuming volumes equivalent to design day estimates,
5 which are derived from historical consumption and forecast growth;
- 6 2) Minimum pressures for stations and customers' requirements are met;
- 7 3) Required supply is available from Vector Pipeline at Courtright (or the interconnect with
8 TransCanada/GLGT at Courtright) at a pressure of 4826 kPag (700 psig);
- 9 4) 18 TJ/d of supply is available from Dawn via the NPS 8 Kimball Line;
- 10 5) Injections to fill Dow A Pool creates a demand of 43 TJ/d.

11 Operating conditions that do not meet the pressure and /or flow constraints identified above
12 indicate that additional facilities (reinforcement) or alternatives are required to maintain reliable
13 natural gas service to Union's customers.

14
15 Prior to 2013/2014, the SIL System's design day demand was 519 TJ/d, which includes 366 TJ/d
16 for firm contracts and regular rate customers, 110 TJ/d for interruptible contract rate customers
17 and 43 TJ/d for Dow A Pool storage injections. The SIL System market has been steadily
18 growing and the SIL is currently at capacity.

19
20 Recently, Union has received multi-phased firm load increase requests from NOVA and Shell
21 Canada. For 2015/2016, the SIL System pipeline facilities cannot serve the requested growth,
22 requiring Union to build incremental pipeline facilities to meet all market demands. For
23 2015/2016, the SIL System's forecast design day demand of 627 TJ/d includes 423 TJ/d for firm

contracts and regular rate customers, 161 TJ/d for interruptible contract rate customers and 43 TJ/d for Dow A Pool storage injections.

With the requirement to build incremental facilities on the SIL System to meet the new NOVA and Shell Canada demands, and further industrial growth expected on the SIL System as described in Section 3, Union forecasts that by 2019/2020, the design day demand will be 690 TJ/d. This represents an increase of approximately 120 TJ/d of firm demand and 51 TJ/d of interruptible demand, which began in 2013/2014.

With the increasing demand on the SIL System, Union's concern with security of supply also continues to grow.

3- Security of Supply Requirement

Currently, to meet design day demands on the SIL System, the design day model assumes that the required supply is available at Courtright. However, as shown in Table 4-1, Union only controls 30% of the long-term supply to meet SIL System design day demand.

Under normal operating conditions, as shown in Figure 2-3 and 4-5, Union uses supply from the Vector Pipeline system to meet SIL System demand as well as the S&T Contracts demand. In fact, over the last six years, the SIL System has increasingly relied on supply through the Vector Pipeline system. This creates significant risk to SIL System supply under the following circumstances:

- 1 • When Vector Pipeline flow is at a level well below SIL System demand, particularly when
- 2 i) combined with reverse flow conditions on the TransCanada/GLGT system (i.e.,
- 3 Emerson to Dawn); or ii) in the summer when supply from the MichCon and BGS
- 4 systems is near or at zero and the Dow A Pool is unavailable for withdrawals
- 5 • When there is an operational outage (planned or unplanned) on the Vector Pipeline system
- 6 or the TransCanada/GLGT system

7

8 In the summer, if there was no supply available from the Vector Pipeline system, Union would

9 control only 100 TJ/d of the long-term supply to the SIL System. This includes supply from the

10 NPS 10 Payne Kimball Line (82 TJ/d). Union completed its security of supply analysis based on

11 the firm demand only, assuming that backstopping supply to the SIL System would be required

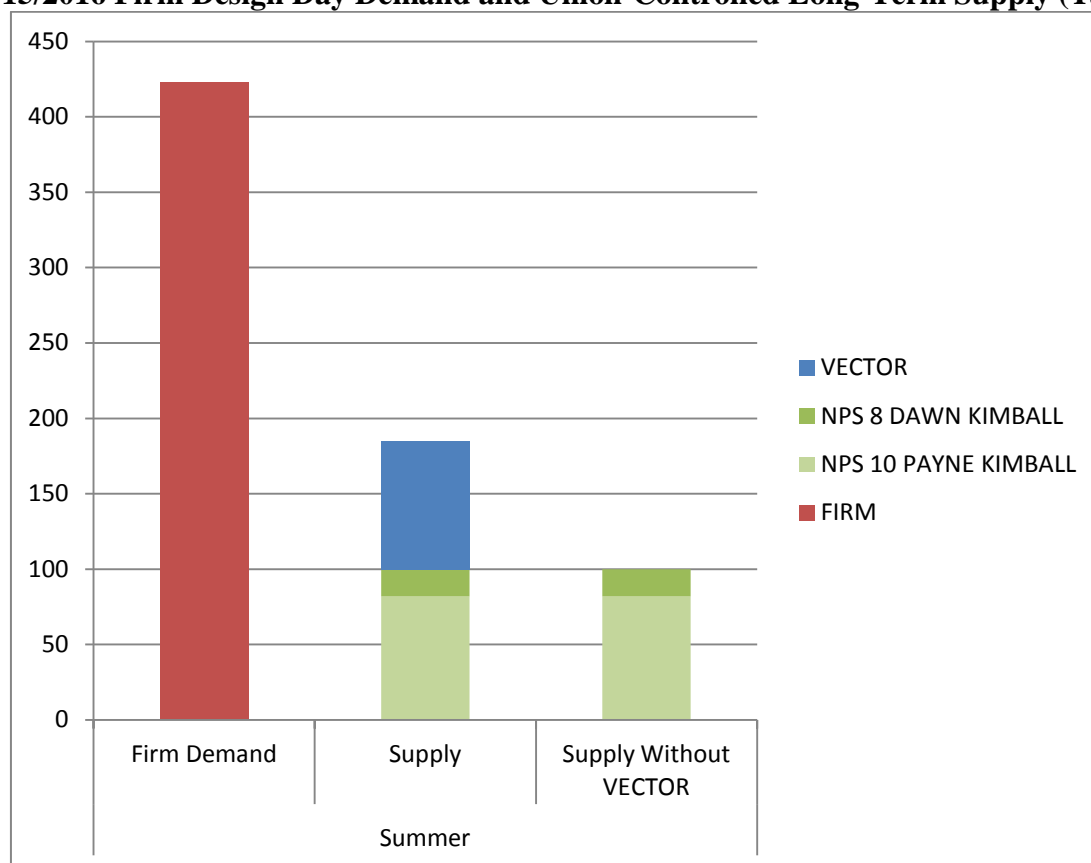
12 on a shorter-term basis.

13

14 Figure 5-1 shows forecast firm design day demand and controlled long-term supply (with and

15 without Vector Pipeline system supply) for 2015/2016.

Figure 5-1
2015/2016 Firm Design Day Demand and Union-Controlled Long-Term Supply (TJ/d)



There is a 238 TJ/d shortfall between the long-term supply controlled by Union and the firm design day demand in 2015/2016. If Vector Pipeline system supply is not available to the SIL System then the shortfall between the long-term supply controlled by Union and the firm design day demand is 323 TJ/d.

The shortfall between Union controlled long-term supply and firm design day demand will continue to grow throughout the planning period as Union is forecasting an additional 70 TJ/d of firm industrial demand growth on the SIL System to 2019/2020. As a result, the security of supply requirement for the SIL System is 386 TJ/d in 2019/2020.

Union has investigated a number of solutions to address this firm supply shortfall for the SIL System and to provide a minimum of 120 TJ/d of capacity to meet Sarnia market demand growth.

4- Alternatives Considered

The proposed facilities were assessed against facility alternatives, commercial alternatives and a combination of both. Facility alternatives are physical solutions involving the construction of additional pipeline (looping) and/or station infrastructure to increase capacity from existing or new supply sources. Commercial alternatives provide incremental supply from the four third-party interconnecting pipeline systems through firm transportation or exchange service contracts. Generally, these commercial alternatives only provide a security of supply solution as incremental deliveries made at the south end of the SIL System require additional pipeline looping to meet demand growth. Therefore, some alternatives may require both facility and commercial components.

For an alternative to be acceptable, it will be required to provide 386 TJ/d of security of supply capacity, which is the estimated supply shortfall to meet the firm component on a design day in 2019/2020 and at least 120 TJ/d of incremental capacity to meet demand growth. Other operational design day requirements, such as minimum pressures for stations and customer requirements, must also be met.

Union has analyzed a number of alternatives which can be grouped into three categories:

- i. Incremental Supply at Courtright and SIL System Capacity Expansion;

1 ii. Incremental Supply from Other Third-Party Interconnecting Pipelines and, where
2 required, SIL System Capacity Expansion; and

3 iii. Incremental Supply from Union's Existing Facilities.
4

5 i. Incremental Supply at Courtright and SIL System Capacity Expansion

6 To move natural gas from Dawn to Courtright or the Courtright area, Union would have the
7 following options:

- 8 ▪ TransCanada back-haul transportation service from Dawn to Courtright
 - 9 ▪ Vector Pipeline back-haul transportation service from Dawn to Courtright
- 10

11 This group of alternatives requires long-term transportation service contracts to ensure that
12 natural gas can be moved from Dawn to Courtright plus will require the construction of 10
13 kilometres of 6620 kPag MOP NPS 16 pipeline to provide capacity to serve the demand growth.
14 This length of pipeline is estimated to cost \$38 million, which does not include any costs to
15 expand the interconnection facilities at Courtright. Based on posted rates, transportation services
16 between Dawn and Courtright would be a minimum of \$2.7 million annually but could be as
17 much as \$20.5 million annually³².
18

19 This category of alternatives is not economic for two primary reasons:

- 20 i. Capital costs are much higher than other alternatives; and
- 21 ii. Significant annual costs are required for the transportation service to get natural gas to
22 Courtright that are not required for other alternatives.

³² These transportation costs do not include the Abandonment Surcharge that will be applied to TransCanada transportation services effective January 1, 2015. TransCanada has not yet filed its Abandonment Surcharge rates with the National Energy Board for approval.

ii. Incremental Supply from Other Third-Party Interconnecting Pipelines and, Where Required, SIL System Capacity Expansion:

Options under this category include:

- MichCon or BGS system supply

The option of BGS system supply requires increased usage of the connection point from the BGS system into the SIL System. The existing connection with the BGS system has a maximum capacity of 0.3 PJ/d. This option requires a significant expansion of the St. Clair Pipelines L.P. (the Bluewater Pipeline) and BGS systems (potentially both additional pipeline and compression). This option also requires Union, at a minimum, to contract for transportation across the BGS system. The combination of capital and annual costs makes this option cost prohibitive.

The option of MichCon system supply would require contracting for transportation services and the construction of 11 kilometres of 6620 kPag MOP NPS 16 pipeline to provide capacity to serve the demand growth. This length of pipeline is estimated to cost approximately \$40 million, which does not include any costs to expand interconnection facilities at the St. Clair Line Station. This option is not economic even before considering annual transportation costs.

iii. Incremental Supply from Union's Existing Facilities:

- a. New pipeline to connect Union's Bluewater and Mandaumin pools with the SIL System
- b. New pipeline to connect Dawn with the SIL System
- c. New pipeline to connect the NPS 20 Payne Storage Line with the SIL System

1 All of these options provide the benefit of further connectivity between the SIL System and
2 Dawn.

3
4 The first option in this category requires the construction of 15.6 kilometres of 6895 kPag
5 MOP NPS 24 pipeline connecting the Bluewater/Mandaumin Measurement Station to the
6 Novacor Corunna Station. The proposed route is from the intersection of Mandaumin Road
7 and Rokeby Line running west along Rokeby Line to the Novacor Corunna Station. This
8 option also requires upgrades to the Novacor Corunna Station. Additional reinforcement of
9 14.5 kilometres of 6895 kPag MOP NPS 20 loop of Union's storage and transmission system
10 is required starting at the Dawn 156 Compressor Station. The cost of the 30.1 kilometres of
11 pipe is multiples higher than other facility alternatives that involve far less pipeline length.

12
13 The second option in this category would provide the SIL System direct access to Dawn.
14 This would require the construction of approximately 25 kilometres of 6895 kPag MOP NPS
15 20 pipeline connecting Dawn to the Novacor Corunna Station and would require upgrades to
16 the Novacor Corunna Station. The cost of 25 kilometres of pipe is multiples higher than
17 other facility alternatives that involve far less pipeline length. Operationally, however, this
18 option provides the most flexibility and may be the best long-term solution.

19
20 The third option in this category requires the construction of 4.8 kilometres of 6895 kPag
21 MOP NPS 20 pipeline connecting Union's Payne Storage Line to the Novacor Corunna
22 Station, including upgrades to the existing Novacor Corunna Station. This alternative would
23 provide the SIL System access to Dawn at a much shorter length of new pipeline. This
24 option, similar to the Payne-Kimball Line, leverages Union's existing NPS 20 Payne Pool

Line, which was built for storage operations, to connect to Dawn. As such, a pipeline between Payne and the Novacor Corunna Station could be used for shorter periods of time to provide security of supply. The capital cost of this alternative is \$24.3 million.

5- Proposed Project

In order to provide reliable, economic, secure supply and to meet the growing design day demand of the SIL System, Union is proposing to install a 4.8 kilometres, 6895 kPag MOP NPS 20 pipeline from Union's Payne Storage Line to the existing Novacor Corunna Station. The proposed routing for the pipeline will start from the NPS 20 Payne Storage Line at Payne, located on Lady Smith Road north of Moore Line, and run north to Rokeby Line. The pipeline would then run west on Rokeby Line where it terminates at the Novacor Corunna Station.

Modifications to the existing Novacor Corunna Station will be required in order to increase its capacity, including the installation of additional measurement and pressure control equipment to allow natural gas to feed into the SIL System.

Union identified an NPS 16 as the adequate pipeline size to provide security of supply for the SIL System without consideration for the firm demand growth forecast to 2020; however, a NPS 20 pipeline can provide security of supply and meet the capacity requirements of the forecasted firm growth. An NPS 20 pipeline provides the synergy of meeting both security of supply and demand growth requirements.

The Proposed Pipeline was selected for a number of reasons:

- i. The Proposed Pipeline is the least cost alternative and is the most efficient project, eliminating the need to build two separate facilities, or one facility plus transportation contracting, to meet demand growth and to satisfy security of supply for the firm demand on the SIL System;
- ii. Union controls the facilities it owns and operates, including the Proposed Pipeline, and those facilities become part of Union's integrated storage and transmission system;
- iii. The Proposed Pipeline provides security of supply for firm demand on the SIL System to 2020 in the event of low flow on the interconnecting third-party pipelines or a pipeline outage on interconnecting third-party pipelines;
- iv. The Proposed Pipeline increases capacity between Dawn, where Union has much of its natural gas delivered or in storage, and the Sarnia market, and reduces Union's exposure to events beyond its control on upstream third-party interconnecting pipelines;
- v. The Proposed Pipeline provides an alternative for long-term expansion of the SIL System such that incremental facilities can be built along the SIL or the NPS 20 Payne Storage Line (i.e. could be a first step in a large diameter connection between Dawn and the SIL System);
- vi. The Proposed Pipeline decreases the dependence of the SIL System on supply delivered via the Vector Pipeline system and/or TransCanada/GLGT system, thereby also increasing security of supply for the S&T Contracts, which depend on supply via the Vector Pipeline system.

1 The Proposed Pipeline is a sizable direct connection between the SIL System and Dawn. A
2 schematic showing the SIL System with the Proposed Pipeline installed during a design day in
3 2019/2020 with a Vector Pipeline system supply interruption is included as Schedule 5-2.
4 Schematics showing the SIL System on a design day in 2019/2020 with and without the
5 Proposed Pipeline are included as Schedule 5-3 and 5-4. These two schematics show how the
6 Proposed Pipeline serves the forecasted market growth in the absence of any upstream supply
7 limitations.

COSTS AND ECONOMICS

The Proposed Pipeline is described in Schedule 1-1. Total pipeline costs are estimated to be \$18,367,000 and total station costs are estimated to be \$5,951,000. The total capital cost of the Proposed Pipeline is estimated to be \$24,317,000 and is summarized in Schedules 6-1 and 6-2.

Given the estimated cost of \$24,317,000, the project does not meet the capital pass-through criteria as determined from Union's 2014-2018 Incentive Regulation Mechanism proceeding (EB-2013-0202). These costs will be included in rates in Union's 2019 rebasing application.

As described in Section 5, the Proposed Pipeline is being sized to address security of supply and to accommodate SIL System demand growth through winter 2019/2020. The facilities required to solely provide security of supply for the SIL System, as discussed in Section 5, have an estimated capital cost of \$21,499,000. The incremental capital cost to increase the pipeline size to accommodate demand growth is estimated to be \$2,818,000.

The portion of the Proposed Pipeline that provides security of supply to the SIL System serves existing customer load and will not result in incremental revenues. The portion of the Proposed Pipeline that accommodates incremental demand on the SIL System will result in incremental revenues.

A standalone Discounted Cash Flow ("DCF") analysis was completed for the portion of the Proposed Pipeline serving SIL System demand growth. Union has employed an economic

1 feasibility test consistent with the Board's recommendations in the E.B.O. 188 Report on Natural
2 Gas System Expansion.

3
4 The Board has found that new distribution facilities are in the public interest if no undue burden
5 is placed on existing customers. When the estimated costs and revenues for the portion of the
6 Proposed Pipeline to serve demand growth on the SIL System are included in Union's 2014 new
7 business investment portfolio, the resulting Profitability Index ("PI") is estimated to be 1.21.
8 Similarly, when the estimated costs and revenues for the portion of the Proposed Pipeline to
9 serve demand growth on the SIL System are included in Union's rolling portfolio, as at
10 September 2014, the resulting PI is estimated to be 1.44.

11
12 The DCF analysis and parameters for the growth portion of the project can be found at Schedule
13 6-3 and 6-4. This analysis indicates a Net Present Value ("NPV") of \$180,000 and a PI of 1.06.
14 The DCF analysis was conducted using the capital cost of \$2,818,000 and the incremental
15 transmission revenue associated with the new firm T2 Storage and Transportation Carriage
16 Service requests (NOVA and Shell Canada).

17
18 The incremental transmission revenue is the portion of the customers' rate that is attributed to
19 transmission facilities. The remaining portion of the customers' rate would be used to support
20 the customers' distribution facilities. This segmented approach is consistent with previous
21 filings and E.B.O. 188. This approach ensures customer revenue is not counted more than once
22 when facilities are built in different time periods.

- 1 Union therefore submits that the proposed pipeline is economically feasible and in the public
- 2 interest.

ENGINEERING AND CONSTRUCTION

Proposed Facilities

Union proposes to construct the Proposed Pipeline which will run north from the Payne Compressor Station on Ladysmith Road for approximately 1.8 kilometres to Rokeby Line. The Proposed Pipeline will then run west along Rokeby Line for approximately 2.8 kilometres past Highway 40, to the east side of the CNR railway. The Proposed Pipeline will then cross Rokeby Line to the south and enter the Novacor Corunna Station, (approximately 0.2 kilometres) where the Proposed Pipeline will tie into the SIL System.

Project Schedule

Schedule 7-1 provides the overall project and construction schedule. It is anticipated that construction of the Proposed Pipeline will begin in the summer of 2015 and be completed by November 1 2015. The proposed construction schedule takes advantage of the drier summer months thereby minimizing the impact of construction on agricultural lands and other features such as watercourses.

Design

All design installation and testing of the Proposed Pipeline, including station facilities, will be conducted in accordance with the requirements of Ontario Regulation 210/01, Oil and Gas Pipeline Systems under the Technical Standards and Safety Act 2000. This regulation governs the installation of pipelines and other facilities in the Province of Ontario. The design meets or exceeds the requirements of CSA Standard Z662-11 Oil and Gas Pipeline Systems ("CSA Z662-11") in accordance with the Code Adoption document under the Ontario Regulations.

The pipe design depends on which Class Location it is located within. To determine Class Location, CSA Z662-11 uses a classification system that takes into account land use and population density. The classifications are as follows:

- 1) Class 1 areas consist of 10 or fewer dwellings;
- 2) Class 2 areas consist of 11 to 45 dwellings, or a building occupied by 20 or more persons during normal use such as playgrounds, recreational areas, or other places of public assembly as well as industrial installations;
- 3) Class 3 areas consist of 46 or more dwellings; and
- 4) Class 4 contains a prevalence of buildings intended for human occupancy with 4 or more stories above ground.

The Class Location boundaries are determined by a sliding boundary 1.6 kilometres long by 400 metres wide centered over the pipeline. This method covers existing development. This is supplemented with information regarding future development through discussions with Landowners and municipalities. Pipelines may be designed to accommodate a higher Class Location to be compatible with future development.

For the entire 4.8 kilometre section, there is a mix of Class 1 and Class 2 Locations. In all locations a design factor of 0.8, as required by CSA Z662-11, was used for the design of the Proposed Pipeline. In addition a second design factor is applied. A location factor of 0.625 was used for all locations including:

- 1) when crossing any public right of ways including roads, highways, public streets, railways and major rivers;
- 2) for any fabrications such as stations or valve sites; and

3) for pipeline undercrossings.

The Proposed Pipeline design parameters will be in accordance with Schedule 7-2. The Proposed Pipeline is designed to meet a Class 3 location factor to accommodate future potential industrial development.

Specifications

Minimum pipe specifications are covered in Table 7-1. The Proposed Pipeline will use NPS 20 pipe which has an outside diameter of 508 mm. One pipe design will be used for all NPS 20 pipe.

Table 7-1

	NPS 20 Pipe
Outside Diameter	508 mm
Grade	483 MPa
Wall Thickness	7.6mm
Category	Cat II
Coating	FBE & Abrasion coating

The NPS 20 pipe will be manufactured using an ERW (Electric Resistance Welding) process. As per CSA Z662-11, the pipe will be manufactured to the American Petroleum Institute (“API”) 5L Line Pipe standard. The pipe is designed to provide the required maximum operating pressure (“MOP”) of 6895 kPa.

The rating of all valves, flanges and fittings will be PN 100 rated for a maximum pressure of 9930kPa.

Based on the pipe specifications provided above, the hoop stress of the NPS 20 pipe will be as listed in Table 7-2:

Table 7-2

Design Factor	Location Factor	Wall Thickness (mm)	Pipe Grade (MPa)	% SMYS
0.8	0.625	7.6	483	48%

Minimum depth of cover required will be 1.0 metre from top of pipe to final grade. Where required, additional cover will be used to accommodate planned or existing underground facilities and roads, railways and watercourse crossings. In agricultural areas the minimum depth of cover will be 1.2 metres.

Construction

Schedule 7-3 describes the general techniques and methods of construction that Union will employ for the construction of the Proposed Pipeline. This schedule also details such activities as clearing, grading, stringing of pipe, trenching, welding, backfill, tile repair and clean-up.

Bedrock will not be encountered.

The Proposed Pipeline will be tested hydrostatically with water for a period of 24 hours to prove its integrity. Testing will follow the requirements of CSA Z662-11, Section 8, and any fabrication tests that will be fully exposed or above ground, will require a 1 hour minimum

1 pressure test. Locations for hydrostatic testing water sources have not yet been determined and
2 will be developed in conjunction with the Pipeline Contractor once the construction contract is
3 awarded. Union will work with the Pipeline Contractor to locate a water source that is economic
4 and creates the least environmental impact.

5
6 After the test water is removed, the pipeline will be dried. An electronic sizing tool will be run
7 to check for dents or ovality. Cathodic protection will be applied to the completed pipeline.

8
9 Union foresees no issues obtaining material for the project within the proposed timelines and
10 Union foresees no issues in obtaining a Pipeline Contractor to complete the proposed
11 construction.

12
13 Union will construct the Proposed Pipeline in compliance with its current construction
14 specifications, environmental mitigation identified in the Environmental Report, permit
15 conditions and commitments to Regulators and Landowners. Union continuously updates and
16 refines its construction procedures to minimize potential impacts to lands and has since seen
17 many improvements as a result of better construction practices.

18
19 Union will continue to work with each municipality and comply with the intent of the various
20 by-laws and permits to the extent possible.

21
22 Union's Landowner Relations Agent ("LRA") will contact each Landowner along the route prior
23 to construction to obtain site specific requirements such as livestock fencing and access points.
24 This information is included in the construction contract so that the Pipeline Contractor is

1 contractually obligated to fulfill all commitments made to the Landowners. The visit also
2 provides an informal opportunity to answer questions and discuss construction plans.

3
4 If systematic drainage systems will be encountered then pre-construction tiling will be completed
5 if necessary and if timing and soil conditions permit. This is done to minimize disruption to field
6 drainage systems and farm operations that may result from pipeline construction. Pre-
7 construction tiling can only be undertaken when the existing tile system design, available outlet
8 drains, topography, and soils allow for the installation of header tile adjacent to the pipeline
9 construction area. Union retains a qualified drainage consultant to determine whether a property
10 that contains a field drainage system could benefit from pre-construction tiling. Union's
11 drainage consultant will be contacting the Landowners to discuss their tile needs. Landowner
12 approval is required for tiling work conducted outside of the easement. The drainage consultant
13 will prepare a tiling plan and provide a copy of the plan to both Union and the Landowner.

14
15 Union's Reforestation Program consists of replanting twice the woodlot area cleared for
16 construction. Coniferous and deciduous seedlings native to Ontario are planted on the
17 Landowner's property if requested, and maintained up to a period of five years or until the trees
18 reach a free-to-grow status defined by a height of one metre and free of adjacent brush
19 competition. Replanting must be done in accordance with Union's policies regarding tree
20 planting so that the easement is left open for access to the pipeline and aerial patrol.

21
22 All necessary permits, approvals and authorizations will be obtained. Union expects to receive
23 all approvals prior to construction.

- 1 Union will provide inspection staff to ensure that contractual obligations between Union and the
- 2 Pipeline Contractor, Provincial ministries, Municipal Government and Landowners are complied
- 3 with.

ENVIRONMENTAL MATTERS

Proposed Pipeline

An Environmental Report (“ER”) for the Proposed Pipeline was completed in May 2014 by Stantec Consulting Limited. The ER can be found at Schedule 8-1. The ER includes an assessment of pipeline route options, the confirmation of a preferred pipeline route and measures to minimize the impacts to the environment and local residents.

The ER for the Proposed Pipeline was forwarded for review to the Ontario Pipeline Coordination Committee (“OPCC”) in May 2014. Copies of the ER were also forwarded to all affected municipalities, the St Clair Region Conservation Authority and to the First Nations and Métis Nation of Ontario. Comments received from the OPCC and Union responses to these comments can be found in Schedule 8-2.

Copies of the report were made available to affected Landowners upon request.

To inform the public and solicit input from Landowners, tenants and the general public with respect to the Proposed Pipeline, public information sessions were initially held on March 11, 2014. Notification of the information session was provided in local newspapers.

Union believes that by following its standard construction practices and adhering to the recommendations and mitigation identified in the ER reports that construction and operation of the Proposed Pipeline will have negligible impacts on the environment. The ER’s cumulative

1 effects assessment notes that no significant cumulative effects are anticipated from the
2 development of the Proposed Pipeline.

3
4 Union will comply with all mitigation measures recommended in the ER.

5
6 **Ground Water**

7 Union will retain a qualified hydro-geologist to review the existing groundwater conditions along
8 the pipeline route in order to inventory existing water wells. The hydro-geologist will then
9 develop and implement a program for monitoring all wells that could be affected by
10 construction.

11
12 **Species at Risk**

13 Union will initiate the recommended field survey programs to determine the presence or absence
14 of species at risk and their habitats along the Proposed Pipeline route. Union will work with the
15 Ontario Ministry of Natural Resources should any species at risk or habitat be identified through
16 the field survey program to develop appropriate mitigation procedures.

LAND MATTERS

An Aerial photograph showing the Proposed Pipeline location is provided in Schedule 9-1.

Union will require approximately 4.37 hectares (10.80 acres) of permanent easement for the Proposed Pipeline. Union will also require approximately 7.28 hectares (18 acres) of temporary easement for construction and top soil storage purposes.

Proposed Pipeline Easement Requirements

A list of the properties and the approximate dimensions of permanent easements and temporary easements required for the Proposed Pipeline is outlined in Schedule 9-2, which includes private Landowners, the Township of St. Clair and two industrial Landowners. Union has rights in place with all the private Landowners and is finalizing negotiations with the remaining Landowners.

Union's form of easement is attached as Schedule 9-3. This agreement covers the installation, operation, and maintenance of one pipeline. The major restrictions imposed on the Landowner by the agreement are that the Landowner cannot erect buildings or privacy fencing on the easement. In addition, the Landowner cannot excavate on the easement or install field tile without prior notification to Union. The Landowner is free to farm the easement, or turn the easement into a laneway.

The temporary easements are in the form previously provided to the Board and used by Union in the past on similar pipeline projects. These agreements are usually for a period of two years,

beginning in the year of construction. This allows Union an opportunity to return in the year following construction to perform further clean-up work as required.

A portion of the Proposed Pipeline will be constructed on road allowance under Union's existing franchise agreement with the Township of St. Clair. No issues have been identified.

In addition to the permanent easement requirements for the construction of the Proposed Pipeline, Union has entered into an agreement of purchase and sale to purchase 6.35 acres of land adjacent to Union's existing Novacor Corunna Station, being Part of Lot 26, Concession 8, Township of St. Clair, County of Lambton, for the purpose of expanding the existing station. This transaction is scheduled to close on October 30th, 2014.

Construction Monitoring and Commitment Follow-up

For over a decade Union has had in place a comprehensive Landowner relations program which has proven successful on other projects. The key elements of this program are a Complaint Tracking system, and the assignment of a LRA to ensure that commitments made to Landowners are fulfilled, to address questions and concerns of the Landowners, and to act as a liaison between Landowners, the Pipeline Contractor and Union's project personnel.

Union's Complaint Resolution System will be used for this project to record, monitor, and ensure follow-up on any complaint or issue received by Union related to the construction. This process assists in resolving complaints and tracking the fulfillment of commitments. A process chart and explanatory notes that describe the Complaint Resolution System are found in Schedule 9-4.

1 In addition to the LRA's duties during construction, the person assigned to this position will
2 conduct post-construction interviews to capture any outstanding concerns, including damages, so
3 that they can be resolved; and capture comments so that they may be considered in the planning
4 of future projects.

5
6 When the cleanup has been completed, the Landowner will be asked by a Union representative to
7 sign a clean-up acknowledgement form if satisfied with the clean-up. This form, when signed,
8 releases the Pipeline Contractor allowing payment for the clean-up on the property. This form in
9 no way releases Union from its obligation for tile repairs, compensation for damages and/or
10 further clean-up as required due to erosion or subsidence directly related to pipeline construction.

FIRST NATIONS AND MÉTIS NATIONS CONSULTATIONS

Union has a long standing practice of consulting with First Nations and Métis Nations, and has programs in place to ensure they are aware of Union's projects and have the opportunity to participate in both the planning and construction phases of Union's projects.

Union has an extensive data base and knowledge of First Nations and Métis organizations in Ontario and consults with the Tribal organizations and the data bases with the Ministry of Natural Resources, with the Ministry of Aboriginal Affairs and with Aboriginal Affairs and Northern Development Canada to ensure consultation is carried out with the most appropriate groups.

Union has signed a General Relationship Agreement with the Métis Nation of Ontario which describes Union's commitments to the Métis when planning and constructing pipeline projects.

The following First Nations and Métis were notified by email and a letter regarding the Proposed pipeline as identified in Table 10-1.

Table 10-1

Chief Christopher Plain	Aamjiwnaang First Nation
Sharilyn Johnston: Environmental Coordinator	Aamjiwnaang First Nation
Chief Louise Hillier	Caldwell First Nation
Chief Tom Bressette	Kettle and Stony Point First Nation
Chief Joe Miskokomon	Chippewa of the Thames First Nation
Chief Burton Kewayosh	Walpole Island First Nation
Dean Jacobs: Consultation Manager	Walpole Island First Nation
Joanne Meyer: Director of Lands, Resources and Consultation	Métis Nation of Ontario

The following First Nations requested that Union conduct formal consultations and/or engagement meetings with them:

- Chief Louise Hillier from the Caldwell First Nation requested that Union continue to provide updates to the community on the Proposed Pipeline.
- Chief Tom Bressette from the Kettle and Stony Point First Nation requested a review of the Proposed Pipeline with the Community Consultation Committee.
- Aamjiwnaang First Nation requested a presentation be made to the Community Environmental Committee on the Proposed Pipeline.

Copies of the correspondence that was sent to the First Nations and Métis groups can be found in Schedule 10-1.

Due to the size and location of the Proposed Pipeline, Union is not anticipating issues to be raised regarding the project. Union proposes to address concerns in the following manner:

- Regular updates will be sent to all of the First Nations and Métis Nation potentially affected by the Proposed Pipeline

- Union held an information meeting with the Aamjiwnaang Environmental Committee on May 6, 2014. Union provided them with a copy of the Environmental Report and will provide them with a copy of the Archaeological Report when it is completed.

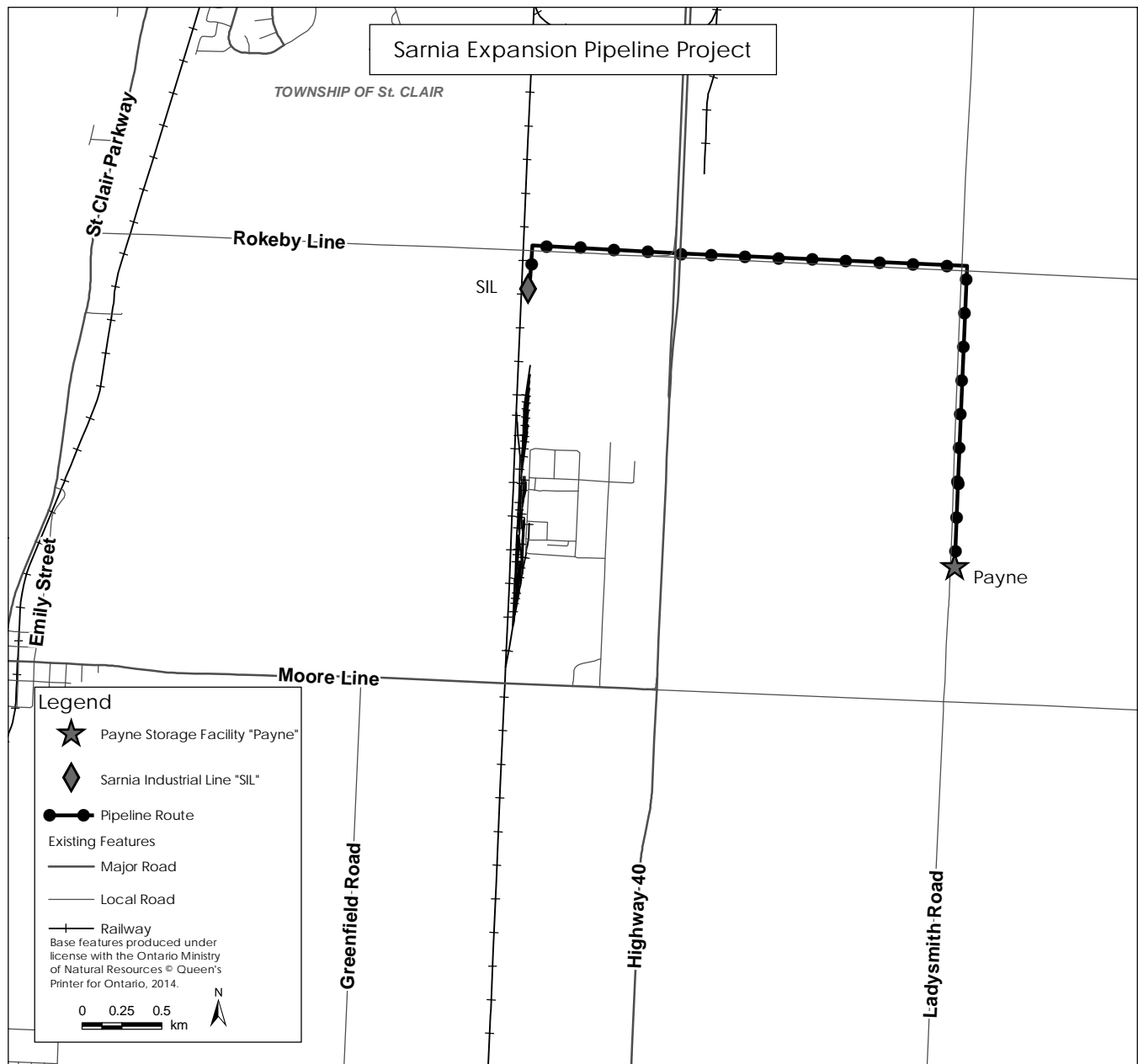
- Union held an Information meeting with the Kettle and Stony Point First Nation on October 1, 2014. Union provided them with a copy of the Environmental Report and will provide them with a copy of the Archaeological Report when it is completed.

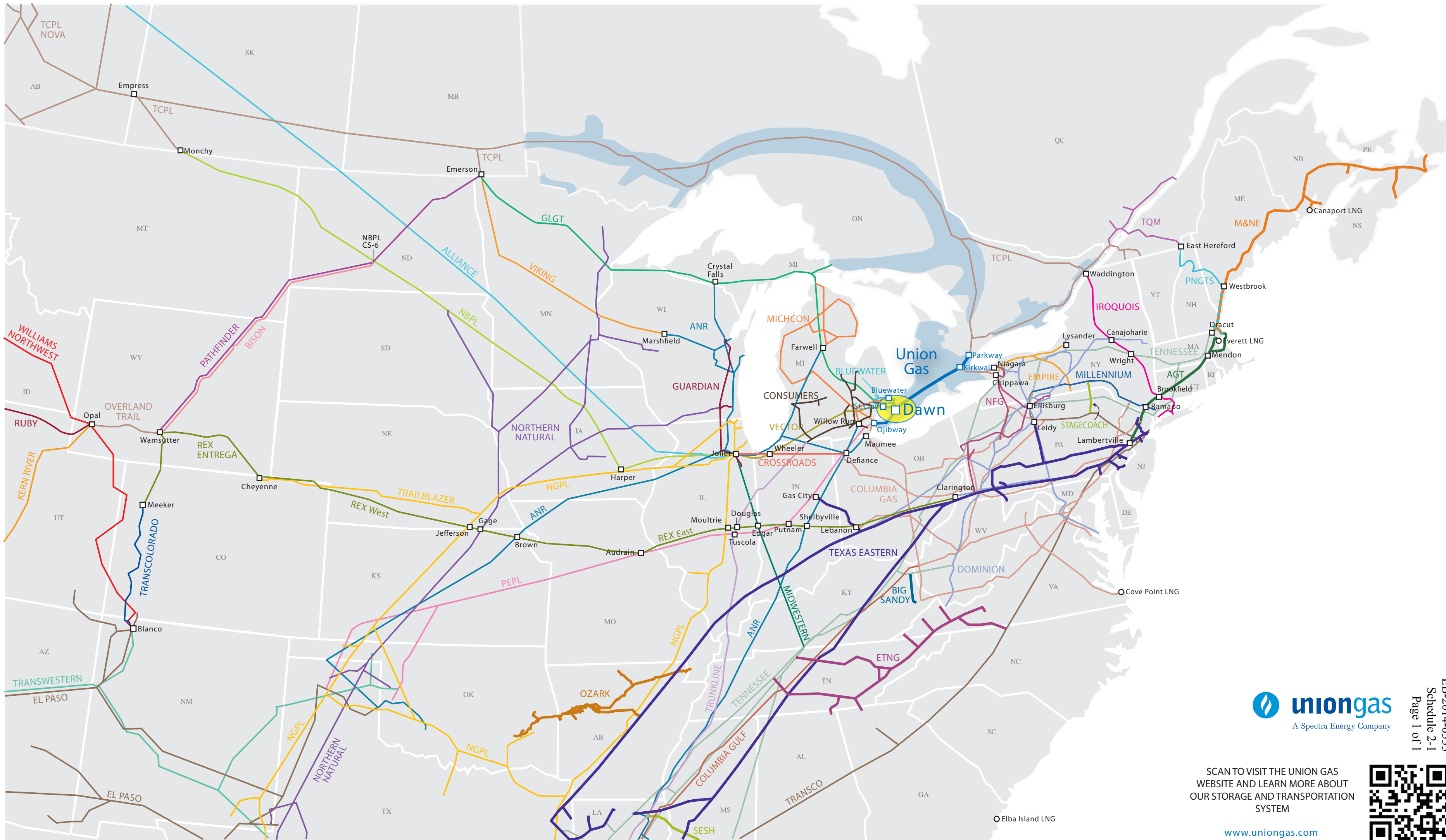
- Upon completion of the necessary archaeological assessments for the project, Union will make available the assessments to any First Nations or Métis Nations that request a copy

- Union will undertake to complete construction in accordance with the mitigation measures recommended in the assessments.

During construction, Union has inspectors in the field who are available to First Nations and Métis as a primary contact to discuss and review any issues that may arise.

Union will continue with its commitment to enhance its relationship with First Nations and Métis Nations communities.





SCAN TO VISIT THE UNION GAS
WEBSITE AND LEARN MORE ABOUT
OUR STORAGE AND TRANSPORTATION
SYSTEM

www.uniongas.com



T2 CONTRACT

This GAS STORAGE AND DISTRIBUTION CONTRACT ("**Contract**"), made as of the 1st day of September, 2014 (the "**Effective Date**")

BETWEEN:

Union Gas Limited

hereinafter called "**Union**"

and

NOVA Chemicals (Canada) Ltd.

hereinafter called "**Customer**"

WHEREAS, Customer is currently receiving gas storage and distribution services from Union pursuant to a Gas Storage And Distribution Contract dated October 15 2011 (the "**Current Services**") , and Customer has now requested from Union and Union has agreed to provide Customer with additional gas storage and distribution services (which, including the Current Services, shall be known as the "**Additional Services**");

AND WHEREAS, Union is proposing to build, own and operate natural gas facilities (the "**Expansion Facilities**") required to provide the Additional Services to Customer and to other customers in the Sarnia area;

AND WHEREAS, Customer and Union agree that if any of the conditions precedent as detailed herein cannot be satisfied or waived by Union, then the contract parameters for the Services shall be revised to those alternate services as more fully described in Schedule 1 (which, including the Current Services, shall be known as the "**Alternate Services**") subject to the terms hereof and as also detailed herein;

IN CONSIDERATION of the mutual covenants, contained herein and other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1 INCORPORATIONS

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters contained in Schedule 1 – DCQ, Storage and Distribution Services Parameters, and Schedule 1a – Supplemental Services Parameters as amended from time to time, and
- b) The latest posted version of the T2 Contract Terms and Conditions contained in Schedule 2 subject to Section 12.18 of Union's General Terms and Conditions; and
- c) The latest posted version of Union's General Terms and Conditions subject to Section 12.18 of Union's General Terms and Conditions; and
- d) The applicable T2 Rate Schedule as amended from time to time and as approved by the Ontario Energy Board.

For the purposes of this Contract, "**Point(s) of Receipt**" shall mean those points identified in Schedule 1 where Union may receive Gas from Customer.

For the purposes of this Contract, "**Services**" shall mean either Additional Services, or Alternate Services, as applicable.

2 CONDITIONS PRECEDENT

a) The obligations of Union to provide the Additional Services hereunder are subject to the following conditions precedent that are for the sole benefit of Union and which may be satisfied or waived in whole or in part in the manner provided in this Contract:

- (1) Union shall have obtained, in form and substance satisfactory to Union, acting reasonably, and all conditions shall have been satisfied under, all governmental, regulatory and other third party approvals, consents, orders and authorizations, that are required to construct the Expansion Facilities; and,
- (2) Union shall have obtained all internal approvals that are necessary or appropriate to construct the Expansion Facilities.

Union and Customer shall each use commercially reasonable efforts to satisfy and fulfil the condition precedent specified in Section 2(a)(1).

b) Union shall notify Customer in writing of the satisfaction or waiver of each applicable condition precedent as stipulated in this Section 2.

The condition specified in Section 2 (a)(1) shall be automatically waived if Union has not otherwise notified Customer before July 1, 2015.

The condition specified in Section 2 (a)(2) shall be automatically waived if Union has not otherwise notified Customer before January 1, 2015.

3 CONTRACT TERM

This Contract shall be effective from the date hereof. However, the Services, Union's obligations to provide the Services, and Customer's obligation to pay for the Services shall begin on October 1, 2014. The first Contract Year shall commence on October 1, 2014 and end on October 31, 2015, with any subsequent Contract Year commencing on a November 1.

- (a) If all conditions precedent in Section 2 are satisfied, waived by Union or automatically waived hereunder, then the parameters in Schedule 1 labelled "**Additional Services**" shall apply from and after the In Service Date, subject to the operation of Section 3(c) and the term of this Contract shall continue for an additional period of [REDACTED] commencing on November 1, 2015.
- (b) "In Service Date" or "ISD" means the first day of the month after the month in which the Expansion Facilities are completed and in service. Union shall notify Customer in writing

within three (3) business days of the day on which the Expansion Facilities are completed and in service.

- (c) If Union determines, acting on a commercially reasonable basis, that the Expansion Facilities cannot be completed and in service before November 1, 2015, it shall notify the Customer in writing of that determination on or before September 1, 2015. From and after that notification, the provision of Additional Services by Union are modified, as follows:
- (1) On or before September 15, 2015, Union shall communicate in writing to Customer the Monthly Transition Arrangement for the period from November 1, 2015 to the ISD;
 - (2) For purposes of this Section 3 (c), "Monthly Transition Arrangement" or "MTA" means the terms upon which Union offers to provide the Additional Services to the Customer for the period from November 1, 2015 to the ISD, including its estimated incremental cost therefor, which shall be determined by Union to be among the lower cost options available for Union to provide the Additional Services without the Expansion Facilities based on Union's review of its system using commercially reasonable efforts. Pursuant to the MTA (if accepted by Customer), Union shall be entitled to receive from Customer without mark-up its actual incremental monthly cost of providing the Additional Services without the Expansion Facilities.
 - (3) If Customer does not accept the MTA offered by Union by notifying Union in writing of its acceptance on or prior to October 15, 2015, then the parameters for Alternate Services as specified in Schedule 1 herein shall be deemed to apply for the period between November 1, 2015 and the ISD only. For clarity, the parameters for Additional Services as specified in Schedule 1 herein shall apply from and after the ISD for the remaining term of this Contract.
- (d) If Union notifies Customer in writing that a condition precedent in Section 2 is not satisfied or waived prior to the date on which it is automatically waived hereunder, then the parameters labeled "**Alternate Services**" as shown in Schedule 1 shall apply on November 1, 2015 for a term to be determined in accordance with the following paragraph of this section 3 (d), and subject to the operation of section 3 (e).

The additional period of the term of this Contract during which Alternate Services apply shall begin on November 1, 2015, and shall be determined by the following method:

- a. Union will calculate Customer's Share of the actual Project Costs plus the costs associated with Union's Rokeby meter station serving Customer ("Total Costs"). Union will provide Customer with a detailed list of Total Costs within 60 days of any applicable Conditions Precedent notice.
- b. The additional period of the term of this Contract during which Alternate Services apply will then be calculated utilizing Union's Ontario Energy Board approved new business economic model using incremental firm revenue since April 1, 2013 and the Total Costs.

(e) If Union notifies Customer that a condition precedent in Section 2 is not satisfied or waived prior to the date on which it is automatically waived, then the following provisions shall apply:

- (1) On or before September 1, 2015 and September 1 of each subsequent Contract Year during the remaining term of this Contract, Union shall communicate in writing to Customer the Temporary Annual Arrangement for the subsequent Contract Year;
- (2) For purposes of this Section 3 (e), "Temporary Annual Arrangement" means the terms upon which Union offers to provide the Additional Services to the Customer for that Contract Year, including its estimated incremental cost therefor, which shall be determined by Union to be among the lower cost options available based on Union's review of its system using commercially reasonable efforts. Pursuant to the Temporary Annual Arrangement (if accepted by Customer), Union shall be entitled to receive from Customer without mark-up its actual incremental cost of providing the Additional Services without the Expansion Facilities.
- (3) If Customer does not accept the Temporary Annual Arrangement offered by Union for a Contract Year pursuant to Section 3(e)1 hereof by notifying Union in writing of its acceptance on or prior to the subsequent October 15, then the parameters for Alternate Services as specified in Schedule 1 herein shall apply unamended for the Contract Year that was the subject of the Temporary Annual Arrangement offered by Union. If Customer so accepts the Temporary Annual Arrangement, then the parameters for Additional Services as specified in Schedule 1 herein shall apply for that Contract Year.

4 SERVICES PROVIDED

Subject to 2(c) herein, Union agrees to provide Services as specified in Schedule 1 and Schedule 1a.

Customer may at any time during the term of this Contract request an increase to the Contract Parameters and Union at its sole discretion will review whether or not it can accommodate Customer's request and if Union can accommodate then Schedule 1 and/or Schedule 1a of this Contract shall be amended to reflect the Customer's requested change in Contract Parameters.

(a) Customer's Corunna delivery location

On or after November 1, 2016, Customer may at any time for the remaining term of this Contract request a decrease to the Contract Parameters subject to the following:

- (1) If Additional Services are being provided then:

- a. During the remaining term of the Contract Customer has a unilateral right to reduce Corunna's Firm Daily Contract Demand to an amount not less than [REDACTED] per day with Notice.
 - b. Such Notice shall be provided not less than 90 days prior to the start of a Contract Year and will specify the new Firm Daily Contract Demand. The effective date of any such decrease shall be the beginning of the next Contract Year.
 - c. If Customer exercises its right to reduce the Firm Daily Contract Demand Customer's ability to subsequently increase the Firm Daily Contract Demand shall be subject to availability as determined solely by Union.
- (2) If Alternate Services are being provided then,
- a. During the remaining term of the Contract Customer shall not reduce its Firm Daily Contract Demand at Customer's Corunna location.
 - b. Customer's ability to increase the Firm Daily Contract Demand at the Corunna location shall be subject to availability as determined solely by Union.

(b) Customer's St Clair, Moore and SRCP delivery locations

On or after November 1 2015, Customer has the option to:

- (1) Remove St Clair, Moore or SRCP Delivery Points from this contract at any time with Notice. Such Notice shall be provided no less than 90 days prior to the start of a Contract Year and the effective date of any such change shall be the beginning of the Contract year following Union's receipt of Notice or;
- (2) Reduce Contract Parameters in Schedule 1 at St Clair, Moore or SRCP Delivery Points at any time with Notice. Such Notice shall be provided no less than 90 days prior to the start of a Contract Year and the effective date of any such reduction shall be the beginning of the Contract year following Union's receipt of Notice.

To be eligible for services under the T2 Rate Schedule, Customer must have an aggregated Firm Daily Contract Demand of at least 140,870 m³ for all Point(s) of Consumption. If the Customer does not maintain this level of aggregated Firm Daily Contract Demand during the current Contract Year or is not expected to maintain this level of Firm Daily Contract Demand then, notwithstanding any other remedy available to Union under this Contract or any other term of this Contract, effective the following Contract Year, the Customer, may no longer qualify for service under the T2 Rate Schedule and may be placed on an alternate service by Union.

5 RATES FOR SERVICE

Customer agrees to pay for Services herein pursuant to the terms and conditions of the following:

- a) The R1 Rate Schedule and the T2 Rate Schedule as they may be amended from time to time by the Ontario Energy Board; and
- b) This Contract and the incorporations hereto.

6 NOTICES

Notices shall be delivered pursuant to the Notice provision of the General Terms and Conditions and delivered to the addresses as referenced in Schedule 1.

7 AGENCY (INTENTIONALLY DELETED)

8 LATE PAYMENT CHARGES

Any amounts due and payable by Customer to Union arising under Section 10 of this Contract shall, if not paid by the due date thereof, be subject to late payment charges equal to 1.5% per month (for a nominal rate of 18% per annum compounded monthly) on any unpaid balance including previous arrears.

9 CREDIT REQUIREMENTS

In addition to the terms of Article 5.04 of the General Terms and Conditions, Union may, at any time during the term of this Contract, request financial assurances to cover the potential financial exposure to Union to the end of the term of this Contract. Such financial assurances shall be determined by Union in a commercially reasonable manner and may include, without limitation, expected return on capital invested. Failure to provide such financial assurances shall be treated in a manner provided for in Article 5.04 of the General Terms and Conditions.

10 DEFINITIONS

“Customer’s Share” shall mean ■■■■ of all Project Costs.

“Project Costs” means any and all reasonable costs (including litigation costs, cancellation costs, carrying costs, and third party claims and excluding Union’s return on capital) expenses, losses, demands, damages, obligations, or other liabilities (whether of a capital or operating nature, and whether incurred or suffered before or after the date of this Contract) of Union including amounts paid to affiliates in accordance with the Affiliate Relationship Code as established by the Ontario Energy Board) in connection with or in respect of development and construction of the Expansion Facilities (including without limitation the construction and placing into service of the Expansion Facilities, the obtaining of all governmental, regulatory, and other third party approvals, and the obtaining of rights of way) except for costs that have arisen from the gross negligence, fraud, or willful misconduct of Union.

11 CONTRACT SUCCESSION

This Contract replaces all previous Gas Storage and Distribution Contracts, subject to settlement of any Surviving Obligations.

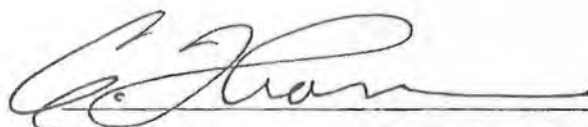
The undersigned execute this Contract as of the above date.

Union Gas Limited

Authorized Signatory

Please Print Name

NOVA Chemicals (Canada) Ltd



We have the Authority to bind the Corporation

Grant Thomson
Senior Vice President &
President, Olefins and Feedstock

Please Print Name



We have the Authority to bind the Corporation
Graeme Flint
Vice President
Business Development

Please Print Name



uniongas
A Spectra Energy Company

Contract ID	
Contract Name	NOVA CHEMICALS TI

Schedule 1

DCQ, Storage and Distribution Services Parameters
Rate T2

1. DATES

This Schedule 1 is effective the 1st day of September, 2014.

"Day of First Delivery" means the 1st day of September, 2014.

2. DAILY CONTRACT QUANTITY (DCQ)***Ontario Point(s) of Receipt**

Location	Obligated DCQ GJ per Day	Obligated DCQ GJ per Day
Parkway		
Dawn		

*Obligated DCQ does not include Compressor Fuel.

3. SUPPLY OF COMPRESSOR FUEL

Customer shall supply compressor fuel for Union's distribution and storage services.

4. STORAGE PARAMETERS

Firm Cost-based Storage Space	
Firm Injection/Withdrawal Right (Customer provides deliverability inventory)	
Firm Injection/Withdrawal Right (Union provides deliverability inventory)	

5. DISTRIBUTION PARAMETERS**5.1) Delivery Pressures and Volumes**

NOVA CORRUNA		
Meter	Minimum Gauge Pressure (kpa)	Maximum Hourly Volume (m³/hour)
# 02405843 – South Meter # 3 # 02405816 – Lots 12 & 24 Concession X, Moore Township, County of Lambton		
NOVA MOORE		
Meter	Minimum Gauge Pressure (kpa)	Maximum Hourly Volume (m³/hour)
# 02405924-North of Boiler House # 00999934-100 M North of Boiler House		
NOVA - ST. CLAIR		
Meter	Minimum Gauge Pressure (kpa)	Maximum Hourly Volume (m³/hour)
# 02405924 # 01197003		
NOVA-SRCP		
Meter	Minimum Gauge Pressure (kpa)	Maximum Hourly Volume (m³/hour)
# 44444444		

5.2) Daily Contract Demand**(a) Current Services**

Effective September 1 – September 30, 2014			
Location	Firm (m³/day)	Interruptible(m³/day)	FHQ * m³/hour
NOVA CORUNNA			
NOVA MOORE			
NOVA - ST. CLAIR			
NOVA-SRCP			

(b) Additional Services

Effective October 1, 2014 – October 31, 2014			
Location			
NOVA CORUNNA			
NOVA MOORE			
NOVA - ST. CLAIR			
NOVA-SRCP			

Effective November 1, 2014 - October 31, 2015			
Location	Firm (m ³ /day)	Interruptible(m ³ /day)	FHQ * m ³ /hour
NOVA CORUNNA			
NOVA MOORE			
NOVA - ST. CLAIR			
NOVA-SRCP			

Effective November 1, 2015 and thereafter			
Location	Firm (m ³ /day)	Interruptible(m ³ /day)	FHQ * m ³ /hour
NOVA CORUNNA			
NOVA MOORE			
NOVA - ST. CLAIR			
NOVA-SRCP			

(c) Alternate Services

Effective November 1, 2015 and thereafter			
Location	Firm (m ³ /day)	Interruptible(m ³ /day)	FHQ * m ³ /hour
NOVA CORUNNA			
NOVA MOORE			
NOVA - ST. CLAIR			
NOVA-SRCP			

NOTES:

*Firm Hourly Quantity (FHQ) means the maximum quantity of natural gas that may flow during any hourly period when an interruption in Interruptible Service becomes effective within a Gas Day.

Maximum Days of Interruption:

Notice Period for Interruption: [REDACTED]

Rate Parameters:

Firm Transportation Commodity - *As per the Rate T2 Rate Schedule*

Firm Transportation Demand - *As per the Rate T2 Rate Schedule*

Interruptible Commodity Charge- if Additional Services are triggered

NOVA CORUNNA	
October 1, 2014 -	[REDACTED]
NOVA MOORE	
November 1, 2014 -	[REDACTED]
NOVA - ST. CLAIR	
November 1, 2014 -	[REDACTED]
NOVA-SRCP	
November 1, 2014	[REDACTED]

Interruptible Commodity Charge- if Alternate Services are triggered

NOVA CORUNNA	
November 1, 2015 -	[REDACTED]
NOVA MOORE	
November 1, 2015 -	[REDACTED]
NOVA - ST. CLAIR	
November 1, 2015 -	[REDACTED]
NOVA-SRCP	
November 1, 2015 -	[REDACTED]

6. MINIMUM ANNUAL VOLUME

Firm Minimum Annual Volume is [REDACTED]

Interruptible Minimum Annual Volume [REDACTED]

7. CONTACT LIST FOR NOTICES

Customer contact information is found in Unionline. Where multiple contacts have been identified by Customer, Union is obligated to contact the first party only.

Union Gas contact information is found on Union's website.

T2 CONTRACT

This GAS STORAGE AND DISTRIBUTION CONTRACT ("**Contract**"), made as of the 15th day of October, 2014 (the "**Effective Date**")

BETWEEN:

Union Gas Limited

hereinafter called "**Union**"

and

Shell Canada Products.

hereinafter called "**Customer**"

WHEREAS, Customer is currently receiving gas storage and distribution services from Union pursuant to a Gas Storage And Distribution Contract dated October 15, 2011 (the "**Current Services**") and Customer has now requested from Union and Union has agreed to provide Customer with additional gas storage and distribution services (which, including the Current Services, shall be known as the "**Additional Services**");

AND WHEREAS, Union is proposing to build, own and operate natural gas facilities (the "**Expansion Facilities**") required to provide the Additional Services to Customer and to other customers in the Sarnia area;

AND WHEREAS, Union is proposing to build, own and operate natural gas custody transfer station (the "**Customer Station**") required to provide the Additional Services to Customer.

AND WHEREAS, Customer and Union agree that if for any reason, any of the conditions precedent as detailed herein cannot be satisfied or waived by Union, then the contract parameters for the Services shall be revised to those alternate services as more fully described in Schedule 1 (which, including the Current Services, shall be known as the "**Alternate Services**") subject to the terms hereof and as also detailed herein;

IN CONSIDERATION of the mutual covenants, contained herein and other good and valuable consideration the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1 **INCORPORATIONS**

The following are hereby incorporated in and form part of this Contract:

- a) Contract Parameters contained in Schedule 1 – DCQ, Storage and Distribution Services Parameters, and Schedule 1a – Supplemental Services Parameters as amended from time to time, and
- b) The latest posted version of the T2 Contract Terms and Conditions contained in Schedule 2 subject to Section 12.18 of Union's General Terms and Conditions; and
- c) The latest posted version of Union's General Terms and Conditions subject to Section 12.18 of Union's General Terms and Conditions; and

- d) The applicable T2 Rate Schedule as amended from time to time and as approved by the Ontario Energy Board.

For the purposes of this Contract, "**Point(s) of Receipt**" shall mean those points identified in Schedule 1 where Union may receive Gas from Customer.

For the purposes of this Contract, "**Services**" shall mean either Additional Services, or, Alternate Services, as applicable.

2 CONDITIONS PRECEDENT

- a) The obligations of Union to provide the Additional Services hereunder are subject to the following conditions precedent that are for the sole benefit of Union and which may be satisfied or waived in whole or in part in the manner provided in this Contract:

- (1) Union shall have obtained, in form and substance satisfactory to Union, acting reasonably, and all conditions shall have been satisfied under, all governmental, regulatory and other third party approvals, consents, orders and authorizations, that are required to construct the Expansion Facilities and the Customer Station; and,
- (2) Union shall have completed and placed into service the Expansion Facilities and the Customer Station; and,
- (3) Union shall have received from Customer the requisite financial assurances, if any, required pursuant to the provisions of this Contract which financial assurances, if required shall be determined solely by Union;

Union and Customer shall each use commercially reasonable efforts to satisfy and fulfil all of the conditions precedent specified in Section 2(a)(1), 2(a)(2), and 2(a)(3).

- (4) Union shall have obtained all internal approvals that are necessary or appropriate to construct the Expansion Facilities and Customer Station.

Union expects that if the approvals required under this section 2 (a) (4) are to be obtained, that they are likely to be obtained prior to October 31, 2014.

- b) Union shall notify Customer in writing of the satisfaction or waiver of each applicable condition precedent as stipulated in this Section 2.
- c) If Union concludes that it will not be able to satisfy or waive a condition precedent, the parameters in Schedule 1 for Additional Services shall no longer be applicable. The party's obligations shall be replaced by the Alternate Services as specified in Schedule 1 herein , provided that Customer shall remain subject to all other provisions hereof.

3 CONTRACT TERM

This Contract shall be effective from the date hereof. However, the Services, Union's obligations to provide the Services, and Customer's obligation to pay for the Services shall begin on November 1, 2014. The first Contract Year shall commence on November 1, 2014 and end October 31, 2015.

The term of this Contract shall start November 1, 2014 and continue as follows:

- (a) If all conditions precedent in Section 2 are satisfied or waived by Union on or prior to November 1, 2015, then the parameters in Schedule 1 labelled "Additional Services" shall apply, and this Contract shall continue for a period of four years commencing on November 1, 2015.
- (b) If all conditions precedent in Section 2 are not satisfied or waived by Union on or prior to November 1, 2015, the parameters marked "Alternate Services" shall apply for a term to be determined in accordance with section 3 (b) 4 hereof.

In such event, Union and Customer shall continue to seek out alternative supply methodologies subject to the approval of both parties. Until such time that Union and Customer are able to agree on the terms by which the Additional Services shall be provided on a permanent basis, the following shall occur:

- 1. Union shall review its system and identify a temporary arrangement for the period between November 1st 2015 and October 31st 2019 ("**Temporary Arrangement**") and any associated incremental cost(s) necessary for Union to continue to provide the Additional Services under the Temporary Arrangement and;
- 2. During this four year period, on or before August 1st of each year Union shall communicate to Customer the Temporary Arrangement and the associated incremental cost(s) to be borne by Customer and;
- 3. If on or before October 15th of each year Customer does not accept the Temporary Arrangement offered by Union and the associated incremental cost(s) pursuant to 3(b)2 above then, effective November 1st the Daily Contract Demand parameters shall be for Alternate Services as specified in Schedule 1 herein shall apply at the beginning of the contract year immediately following when Union offered the Temporary Arrangement option.
- 4. The Contract term for Alternate Services shall be determined based on the following
 - 1. Union will calculate Customer's Share of the actual Project Costs, plus the costs associated with Customer Station serving Customer ("Total Costs"). Union will provide Customer with a detailed list of all Total Costs within 60 days of Conditions Precedent notice.
 - 2. The term of this Contract will then be calculated utilizing Union's Ontario Energy Board approved new business economic model and the Total Costs.

- (c) In either event 3(a) or 3(b), this Contract shall continue thereafter on a year-to-year basis until notice to terminate is provided by either Union or Customer. Such notice must be delivered at least three (3) months prior to the end of the then-current term.

4 SERVICES PROVIDED

Subject to 2(c) herein Union agrees to provide Services as specified in Schedule 1 and Schedule 1a.

The Distribution Contract Demand parameters contained in Schedule 1 and Schedule 1a for the Services ("**Contract Parameters**") that become effective November 1, 2014 shall be the minimum amount which during the term of this Contract shall not be decreased. Customer may at any time during the term of this Contract request an increase to the Contract Parameters and Union at its sole discretion will review whether or not it can accommodate Customer's request and if Union can accommodate then Schedule 1 and/or Schedule 1a of this Contract shall be amended to reflect the Customer's requested change in Contract Parameters.

To be eligible for services under the T2 Rate Schedule, Customer must have an aggregated Firm Daily Contract Demand of at least 140,870 m³ for all Point(s) of Consumption. If the Customer does not maintain this level of aggregated Firm Daily Contract Demand during the current contract year or is not expected to maintain this level of Firm Daily Contract Demand then, notwithstanding any other remedy available to Union under this Contract or any other term of this Contract, effective the following contract year, the Customer, may no longer qualify for service under the T2 Rate Schedule and may be placed on an alternate service by Union.

5 RATES FOR SERVICE

Customer agrees to pay for Services herein pursuant to the terms and conditions of the following:

- a) The R1 Rate Schedule and the T2 Rate Schedule as they may be amended from time to time by the Ontario Energy Board; and
- b) This Contract and the incorporations hereto.



6 NOTICES

Notices shall be delivered pursuant to the Notice provision of the General Terms and Conditions and delivered to the addresses as referenced in Schedule 1.

7 AGENCY

If an agent on behalf of the Customer executes this Contract then, if requested by Union, the agent shall at any time provide a copy of such authorization to Union.

Notwithstanding the provisions of Section 2(a)(3) the agent shall be responsible for providing security arrangements acceptable to Union in accordance with the General Terms and Conditions.

The agent and Customer acknowledge and agree that they are unconditionally and irrevocably jointly and severally liable for all Customer obligations under the Contract.

8 CREDIT REQUIREMENTS

In addition to the terms of Article 5.04 of the General Terms and Conditions, Union may, at any time request financial assurances to cover the potential financial exposure to Union. Such financial assurances shall be determined by Union in a commercially reasonable manner and may include, without limitation, expected return on capital invested. Failure to provide such financial assurances shall be treated in a manner provided for in Article 5.04 of the General Terms and Conditions.

9 DEFINITIONS

"Customer's Share" shall mean [REDACTED] of all Project Costs on the Payne to Sarnia Facilities Expansion.

"Project Costs" means any and all reasonable costs (including litigation costs, cancellation costs, carrying costs, and third party claims and excluding Union's return on capital, expenses, losses, demands, damages, obligations, or other liabilities (whether of a capital or operating nature, and whether incurred or suffered before or after the date of this Contract) of Union including amounts paid to affiliates in accordance with the Affiliate Relationship Code as established by the Ontario Energy Board) in connection with or in respect of development and construction of the Expansion Facilities (including without limitation the construction and placing into service of the Expansion Facilities, the obtaining of all governmental, regulatory, and other third party approvals, and the obtaining of rights of way) except for costs that have arisen from the gross negligence, fraud, or willful misconduct of Union.

Contract ID	SA 10940
Contract Name	SHELL PRODUCTS

10 CONTRACT SUCCESSION

This Contract replaces all previous Gas Storage and Distribution Contracts, subject to settlement of any Surviving Obligations.


The undersigned execute this Contract as of the above date. If an Agent on behalf of Customer executes this Contract then, if requested by Union, Agent or Customer shall at any time provide a copy of such authorization to Union.

Union Gas Limited

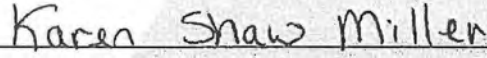
Authorized Signatory

Chris Shorts
Director of Gas Supply

Shell Canada Products



Authorized Signatory



Please Print Name



uniongas
A Spectra Energy Company

Contract ID	
Contract Name	SHELL PRODUCTS

Schedule 1
DCQ, Storage and Distribution Services Parameters
Rate T2

1. DATES

This Schedule 1 is effective the 1st day of November, 2014

"Day of First Delivery" means the 1st day of November, 2014

2. DAILY CONTRACT QUANTITY (DCQ)*

Ontario Point(s) of Receipt

November 1, 2014 – December 31, 2014	
Dawn	
Parkway	
January 1, 2015 –	
Dawn	
Parkway	
- thereafter	
Dawn	
Parkway	

*Obligated DCQ does not include Compressor Fuel.

3. SUPPLY OF COMPRESSOR FUEL

Customer shall supply compressor fuel for Union's distribution and storage services.

4. STORAGE PARAMETERS

November 1, 2014 – December 31, 2014	
Firm Cost-based Storage Space	
Firm Injection/Withdrawal Right (Customer provides deliverability inventory)	
January 1, 2015 – May 31, 2015	
Firm Cost-based Storage Space	
Firm Injection/Withdrawal Right (Customer provides deliverability inventory)	
June 1, 2015 – thereafter	
Firm Cost-based Storage Space	
Firm Injection/Withdrawal Right (Customer provides deliverability inventory)	

5. DISTRIBUTION PARAMETERS

Delivery Pressures and Volumes:

SHELL - CORUNN		
Meter Number	Minimum Delivery Pressure (kpa)	Maximum Hourly Volume (m ³ /hour)
0240518-Customer's Station Northwest Corner of Intersection of H & 3 rd Streets		
02218399- Customer's Station Northwest Corner of Intersection of H & 3 rd Streets		
Additional meters to be added.		

Daily Contract Demand:

(a) Current Services

SHELL - CORUNN	Firm (m ³ /day)	Interruptible (m ³ /day)	FHQ *(m ³ /hour)
November 1, 2013- October 31, 2014			

(b) Additional Services

SHELL - CORUNN	Firm (m ³ /day)	Interruptible (m ³ /day)	FHQ *(m ³ /hour)
November 1, 2014-			

(c) Alternate Services

SHELL - CORUNN	Firm (m ³ /day)	Interruptible (m ³ /day)	FHQ *(m ³ /hour)
November 1, 2015- Thereafter			

*Firm Hourly Quantity (FHQ) means the maximum quantity of natural gas that may flow during any hourly period when an interruption in Interruptible Service becomes effective within a Gas Day.

Maximum Days of Interruption:
 Notice Period for Interruption:

Rate Parameters:

Firm Transportation Demand - As per the Rate T2 Rate Schedule
 Firm Transportation Commodity - As per the Rate T2 Rate Schedule

Interruptible Commodity Charge -

SHELL-CORUNN	
November 1, 2014 - Thereafter	

6. MINIMUM ANNUAL VOLUME

SHELL CORUNN	
Firm Minimum Annual Volume	
Interruptible Minimum Annual Volume	
Total MAV	

7. CONTACT LIST FOR NOTICES

Customer contact information is found in Unionline. Where multiple contacts have been identified by Customer, Union is obligated to contact the first party only.

Union Gas contact information is found on Union's website.



Union Gas
Sarnia Industrial Line Market Analysis

October 2014

Prepared by
Sussex Economic Advisors, LLC

Sussex Economic Advisors, LLC ("Sussex") has relied upon certain public sources of information consistent with standard consulting practices. Sussex makes no warranties or guarantees regarding the accuracy of any estimates, projections or analyses contained herein. Those reviewing the information contained herein waive any claim against Sussex, its partners and employees. Sussex shall not be liable to any party reviewing this information.

Executive Summary

Sussex Economic Advisors, LLC (“Sussex”) was retained by Union Gas Limited (“Union” or the “Company”) to analyze certain natural gas market dynamics that may affect Union’s ability to supply natural gas to customers receiving service on the Sarnia Industrial Line during a design day (“Design Day Demand”); and two Storage & Transportation Contracts (“S&T Contracts” and collectively with the Design Day Demand, the “Supply Requirement”).

Currently, the Supply Requirement is primarily met by natural gas delivered on Great Lakes Gas Transmission (“Great Lakes” or “GLGT”), Vector Pipeline (“Vector”), Michigan Consolidated (“MichCon”), and Bluewater Gas Storage (“Bluewater” and collectively, the “Upstream Pipelines”).¹ Specifically, Union has utilized natural gas supplies scheduled to Dawn on the Upstream Pipelines to meet the Supply Requirement and, where required, replaced that supply with natural gas withdrawn from Union Storage at Dawn, or with other natural gas supplies delivered to Dawn.

The natural gas supply and transportation dynamics that have supported natural gas deliveries by the Upstream Pipelines to Dawn are changing, resulting in reduced flows to Dawn on certain days. The market conditions that result in reduced natural gas flows to Dawn from the Upstream Pipelines could affect the ability of Union to meet the Supply Requirement.

The changes in the natural gas market that affect natural gas shipments on the Upstream Pipelines reflect trends in certain North American natural gas production basins. Historically, a substantial portion of the natural gas supplied to Eastern Canada was sourced from the Western Canadian Sedimentary Basin (“WCSB”). However, WCSB natural gas production has decreased by approximately 24 percent between its peak in 2001 and 2014. Moreover, intra-regional (i.e., WCSB) natural gas demand increased by approximately 25 percent between 2006 and 2012 due to increased demand for natural gas from the electric power generation and oil sands production segments.² The combined effect of decreased WCSB production and increased WCSB demand has reduced natural gas shipments to Eastern Canada. Further, the

¹ In addition to the Upstream Pipelines, Sussex understands that Union has access to a limited amount of Union storage that can serve demand on the Sarnia Industrial Line.

² *Canada’s Energy Future 2013 – Energy Supply & Demand Projections to 2035*, National Energy Board of Canada, November 2013, at 15.

National Energy Board (“NEB”) has noted that it expects the trend of reduced natural gas shipments to Eastern Canada (i.e., less west to east shipments) to continue in the future.^{3,4}

To evaluate the trends in the natural gas market that may influence Union’s ability to meet the Supply Requirement, Sussex conducted certain quantitative and qualitative analysis. The Sussex analysis included an evaluation of natural gas basis differentials (i.e., the market value of pipeline capacity) on the Upstream Pipelines to identify price changes that could explain the shifting delivery patterns on the Upstream Pipelines. In addition, Sussex reviewed the natural gas flows on the Upstream Pipelines to assess whether certain market conditions, and the frequency of those conditions, could result in reduced flows to Dawn and, therefore, less gas supply available to meet the Supply Requirement. Finally, Sussex assessed certain qualitative aspects (e.g., control of the resource and direction of flow) of the current approach used to serve the Supply Requirement.

Based on the Sussex analysis discussed herein, our observations, conclusions and recommendations are:

- To serve the Supply Requirement, Union relies on natural gas flows to Dawn on the Upstream Pipelines.
- The Upstream Pipelines currently access natural gas supply from the WCSB and other natural gas production basins that are facing increased competition from natural gas produced in the Marcellus and Utica shale basins.
- There is increased demand for WCSB gas in Alberta from the oil sands and electric power generation segments, which has resulted in less natural gas supply available for eastern markets (e.g., Ontario) and reduced flows on the Upstream Pipelines.
- The Sussex basis differential analysis identified certain days when the price spread between locations on the Upstream Pipelines and the Dawn Hub were equal to or less than zero (i.e., inverted basis differentials), thus providing an incentive to either not deliver natural gas to Dawn or transport natural gas to other markets (e.g. Michigan or Chicago).

³ Ibid., at 15-16.

⁴ See also Reasons for Decision – TransCanada Pipelines Limited, Nova Gas Transmission Ltd., and Foothills Pipe Lines Ltd., RH-003-2011, National Energy Board of Canada, March 2013. For the NEB’s assessment of the long-term declines in west to east natural gas flows and effects of that trend on the TransCanada Mainline.

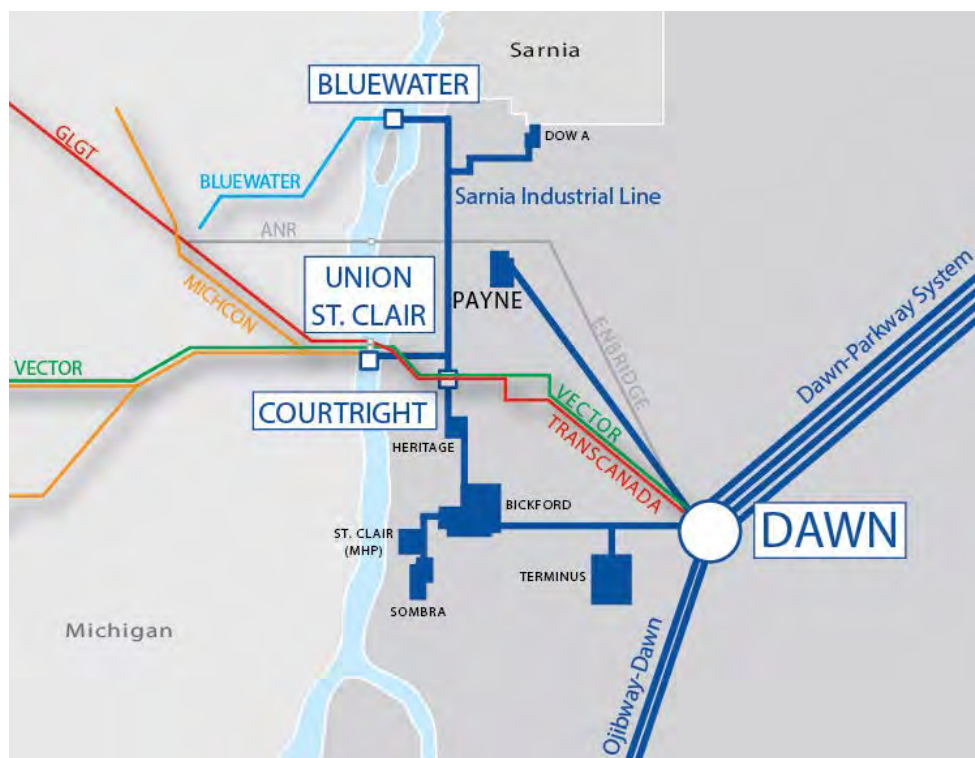
- The number of days observed with inverted basis on the Upstream Pipelines has increased significantly, which, if that trend continues, could reduce the incentive to flow gas to the Dawn Hub.
- The Sussex flow analysis reviewed the flows on each of the Upstream Pipelines and compared that volume to the Design Day Demand and the Supply Requirement. In addition, Sussex analyzed the Upstream Pipeline flows in aggregate relative to the Design Day Demand and the Supply Requirement. Finally, Sussex reviewed the Upstream Pipeline flows on days with inverted basis differentials. The results of these analyses illustrate that flows on the Upstream Pipeline have declined and become less predictable, which may affect the ability of Union to meet the Design Day Demand and the Supply Requirement.
- The short-term nature of the contracting practices on the Upstream Pipelines, coupled with significant contract expirations over the coming years, decreases the predictability of flows to Dawn and increases risk regarding Union's existing approach to meeting Design Day Demand and the Supply Requirement.
- Finally, the inability of Union to predict or control the flow of natural gas to Dawn on the Upstream Pipelines exacerbates the risk of meeting the Design Day Demand and the Supply Requirement.

Based on these observations and conclusions, it is reasonable for Union to seek alternatives that increase the security of gas supply to meet the Design Day Demand and the Supply Requirement.

I. Introduction

Sussex was retained by Union to analyze certain natural gas market conditions that may affect the Company's ability to meet the Supply Requirement (i.e., Design Day Demand on the Sarnia Industrial Line and two S&T Contracts). Currently, the Company relies on natural gas flows to Dawn on the Upstream Pipelines, and certain limited storage volumes, to serve the Supply Requirement. This delivery structure (i.e., flows to Dawn on the Upstream Pipelines) has allowed Union to meet the Supply Requirement without the need for significant Union pipeline assets to connect the Sarnia Industrial Line to Dawn. To better illustrate the physical infrastructure utilized to meet the Supply Requirement, please see Figure 1.

Figure 1: Interconnections with the Sarnia Line⁵



With respect to the Design Day Demand on the Sarnia Industrial Line, Sussex understands that, as of 2015/2016, Union is forecasting approximately 661 TJ per day of Design Day Demand.⁶

In addition to the expected Design Day Demand on the Sarnia Industrial Line described above, Sussex understands the Supply Requirement must also consider the natural gas supply

⁵ Source: Union Gas Limited.

⁶ Ibid.

required to serve the two S&T Contracts that require approximately 593 TJ per day, specifically the contracts are:

1. A 500 TJ per day transportation contract to provide TransCanada with firm service from Dawn to Dawn (TCPL); and
2. A 93 TJ per day transportation contract to provide the Greenfield Power Generation Facility with firm service from Dawn to Dawn (Vector).

When the Design Day Demand of 661 TJ per day is combined with the two S&T Contracts from Dawn, the resultant Supply Requirement is approximately 1,254 TJ per day.⁷

The natural gas market dynamics that support Union's ability to meet the Supply Requirement are evolving. For example, the physical flow of natural gas on Great Lakes (i.e., one of the Upstream Pipelines), has declined largely due to decreasing WCSB natural gas production and increasing intra-WCSB demand for natural gas (e.g., natural gas requirements for oil sands production and electrical power generation). The reduction in WCSB production coupled with the increased demand for natural gas in the WCSB region has resulted in lower natural gas shipments to Eastern Canadian markets. Similarly, Vector has experienced periods in which volumes of natural gas delivered to Dawn declined due to various factors including increased demand in Chicago, declining WCSB natural gas production, and the availability of more cost effective natural gas supplies. The flows on MichCon and Bluewater are also affected by these evolving market trends.

To evaluate market trends that could affect natural gas flows on the Upstream Pipelines, and therefore, Union's ability to serve the Supply Requirement, Sussex utilized various data gathering techniques and developed certain analyses including:

- On-site meetings and conference calls with representatives from Union;
- Obtaining and reviewing publicly available forecasts of North American natural gas production and the potential effects on natural gas pipeline flows into Eastern Canada and the U.S. Northeast;
- Developing quantitative and qualitative analyses to illustrate the change in natural gas flows and pricing dynamics that may affect Union's ability meet the Supply Requirement; and

⁷ Source: Union Gas Limited

- Reviewing the potential risk of limited pipeline flows.

The Sussex observations, conclusions and recommendations are based on the research, analysis and results discussed herein, as well as the collective natural gas supply operations experience and judgment of the Sussex project team.

II. Overview of Natural Gas Market Dynamics

As discussed above, Union has historically utilized natural gas flows to Dawn on the Upstream Pipelines to meet the Supply Requirement. Specifically, Table 1 lists the Upstream Pipeline, capacity level and delivery points.

Table 1: Sources of Supply

Pipeline	Maximum Capacity (PJ/D) ⁸	Primary Delivery Point
GLGT	2.0	Dawn
Vector Pipeline	1.9 ⁹	Dawn
Bluewater	0.3	Sarnia Industrial Line
Michigan Consolidated Gas	0.3	St. Clair

Given the influence of the WCSB on the Upstream Pipelines, a review of the WCSB provides the necessary context regarding the changing flows on the Upstream Pipelines.

WCSB Overview

As shown in Figure 2, the WCSB natural gas production basin is situated in Alberta, British Columbia and Saskatchewan, and is one of the largest sources of natural gas supplies in North America.

⁸ Although the maximum capacity for GLGT, Vector, and MichCon are 2.0, 1.9, and 0.3 PJ per day respectively, certain interconnect limits reduce the amount of natural gas that can be delivered into the Sarnia Industrial Line from these pipelines.

⁹ Source: Union Gas Limited

Figure 2: Map of WCSB¹⁰



In 2000, the WCSB produced approximately 17.8 PJ per day of natural gas, and provided supply to certain regions, including Eastern Canada and the U.S. Northeast via pipelines owned and operated by TransCanada (e.g., Canadian Mainline and Great Lakes). As illustrated in Figure 3, beginning in 2005, production in the WCSB began to decline, and by 2013 WCSB production was 14.1 PJ per day, a reduction of nearly 24 percent from the 2001 level. Due to the trends described below (i.e., increasing intra-regional demand and other gas supply options), the amount of WCSB natural gas shipped to Eastern Canada has also declined. For example, the NEB notes that intra-regional demand in the WCSB increased by approximately 25 percent between 2006 and 2012.¹¹ The combination of the 25 percent increase in intra-regional demand and the approximately 24 percent reduction in WCSB production, results in less natural gas available for west to east shipments.^{12,13}

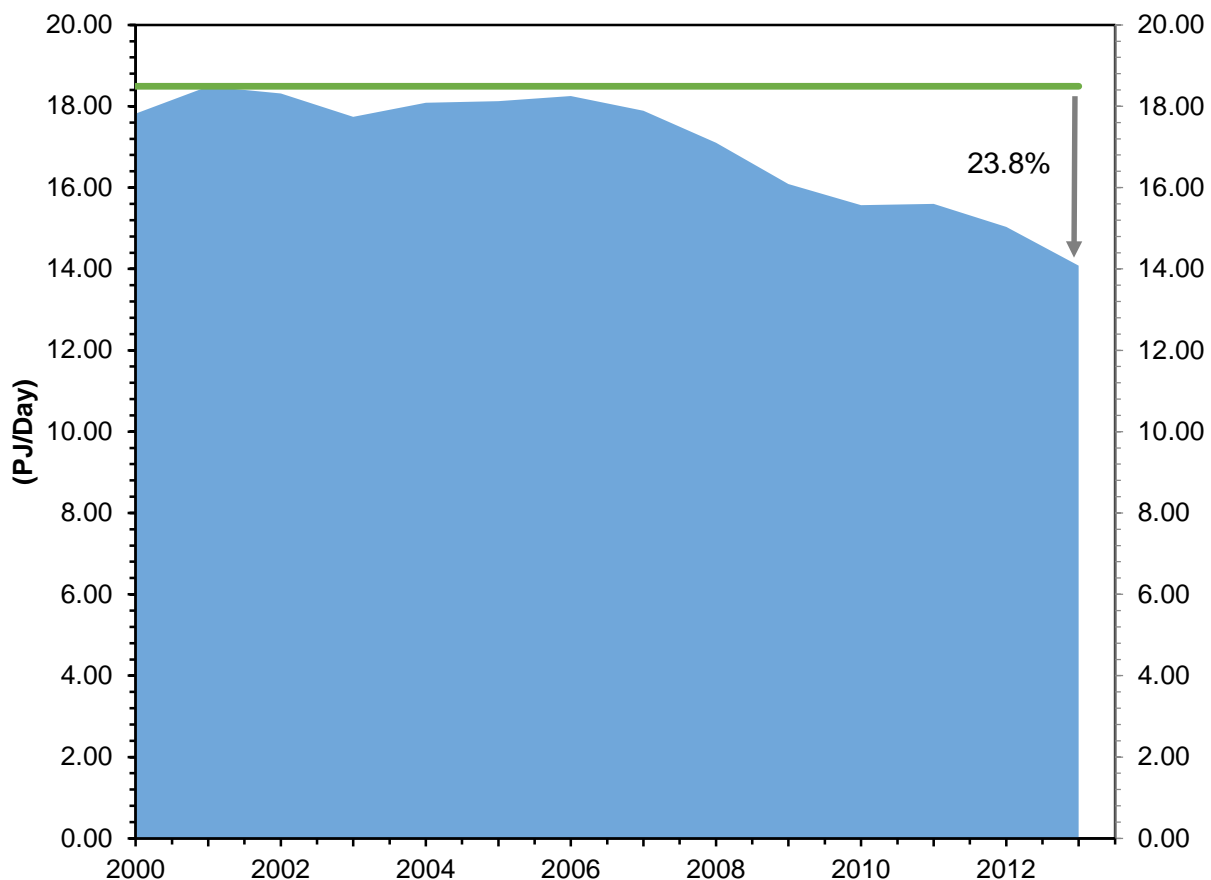
¹⁰ FNR Asset Management Inc., <http://www.fnrm.ca/html/swca/index.cfm>, accessed July 14, 2014.

¹¹ *Canada's Energy Future 2013 – Energy Supply & Demand Projections to 2035*, National Energy Board of Canada, November 2013, at 15.

¹² *Ibid.*, at 15-16.

¹³ See also Reasons for Decision – TransCanada Pipelines Limited, Nova Gas Transmission Ltd., and Foothills Pipe Lines Ltd., RH-003-2011, National Energy Board of Canada, March 2013. For the NEB's assessment of the long-term declines in west to east natural gas flows and effects of that trend on the TransCanada Mainline.

Figure 3: WCSB Production¹⁴



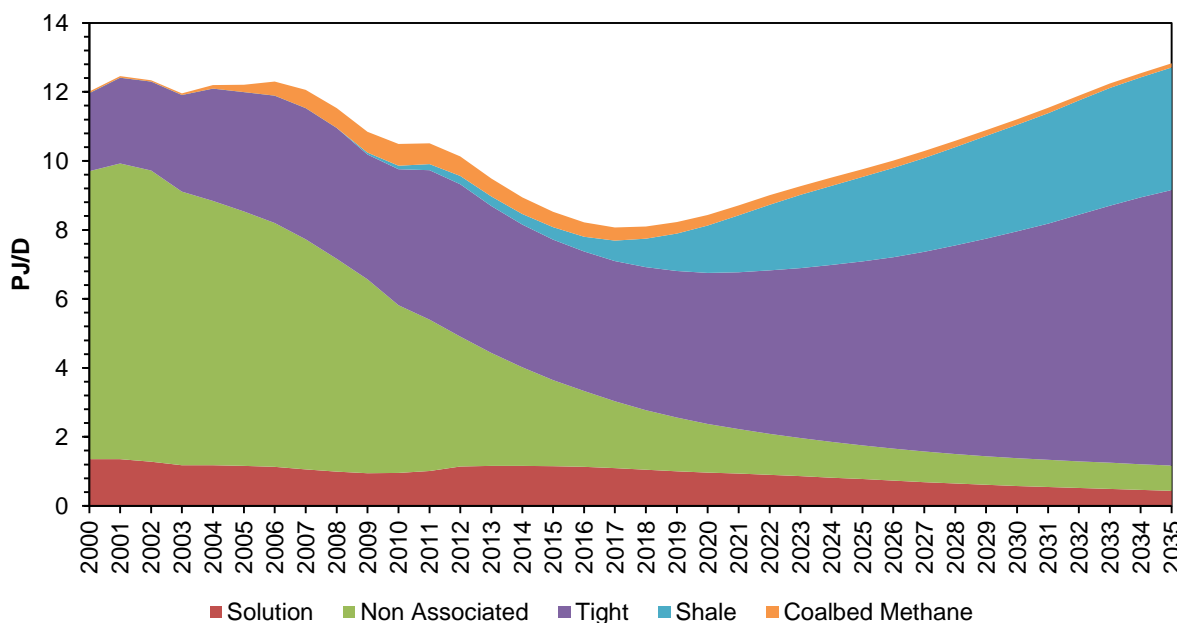
Certain publicly available natural gas production forecasts, including those prepared for the NEB and the U.S. Department of Energy's Energy Information Administration ("EIA"), suggest that the decline in WCSB production is likely to continue until at least 2018. For example, the NEB recently noted that: (i) overall Canadian natural gas production would continue to decline until 2018 when new LNG facilities provide additional price support for WCSB production;¹⁵ and (ii) production will not achieve the levels seen in 2000 until 2035.¹⁶ Please see Figure 4 (below).

¹⁴ *Canada's Energy Future 2013 – Energy Supply & Demand Projections to 2035*, National Energy Board of Canada, November 2013, Natural Gas Supply Appendix 4.

¹⁵ *Ibid.*, at 52.

¹⁶ *Ibid.*

Figure 4: Canadian Natural Gas Production Forecast¹⁷



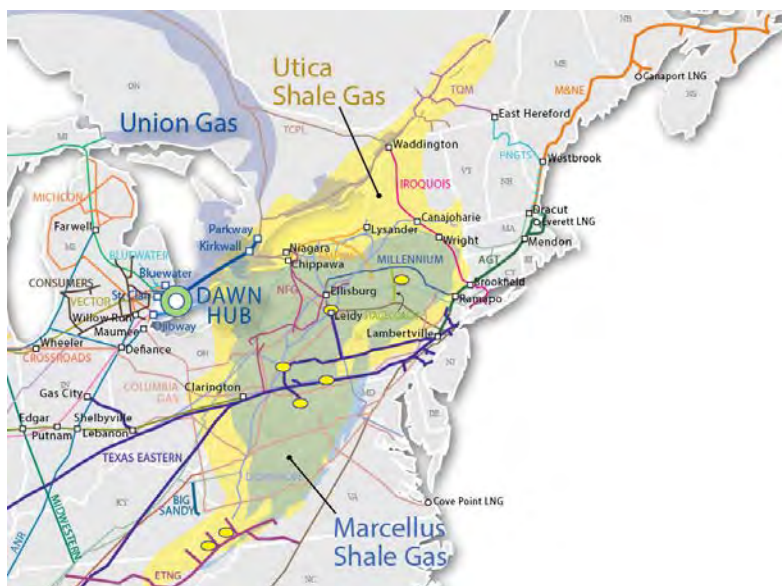
Despite the forecasted increases in production in the latter half of this decade, much of the additional production is unlikely to be shipped to markets in eastern North America due to several trends including:

- Increased natural gas production from the Marcellus and Utica shale basins in the United States is displacing the supply traditionally shipped to consuming markets in Eastern Canada and the U.S. Northeast;
- Increased intraregional consumption of the natural gas produced in the WCSB, including increased use of natural gas to enhance oil recoveries in the Alberta oil sands regions; and
- Potential exports of Liquefied Natural Gas (“LNG”) via British Columbia and Oregon.

First, increased Marcellus and Utica shale gas production is fundamentally re-shaping the North American natural gas industry by increasing the availability of natural gas supplies in an area that is proximate to the traditional natural gas consuming regions in Eastern Canada and the U.S. Northeast. The location of the Marcellus and Utica shale basins are shown in Figure 5 (below).

¹⁷ Ibid.

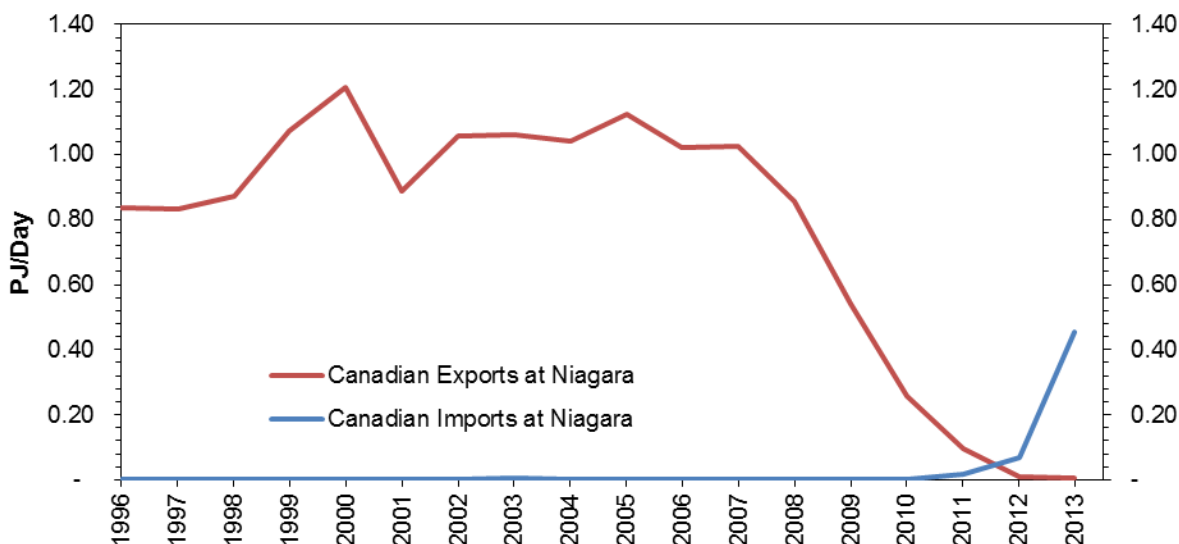
Figure 5: Map of Marcellus and Utica Shale Basins¹⁸



While the development of the Marcellus and Utica shale basins has affected various pipeline flows and price signals, one of the more telling changes is observed at the Niagara export/import point (“Niagara”) on the border of Ontario and New York. Historically, natural gas from the WCSB was transported across Canada to Ontario and exported into New York via the Niagara point. As shown in Figure 6 (below), flows at Niagara have reversed and natural gas is being imported from the U.S. into Canada due to increasing natural gas production in the mid-Atlantic area (i.e., the Marcellus and Utica supply basins).

¹⁸ Source: Union Gas Limited.

Figure 6: Niagara Natural Gas Trade Balance¹⁹

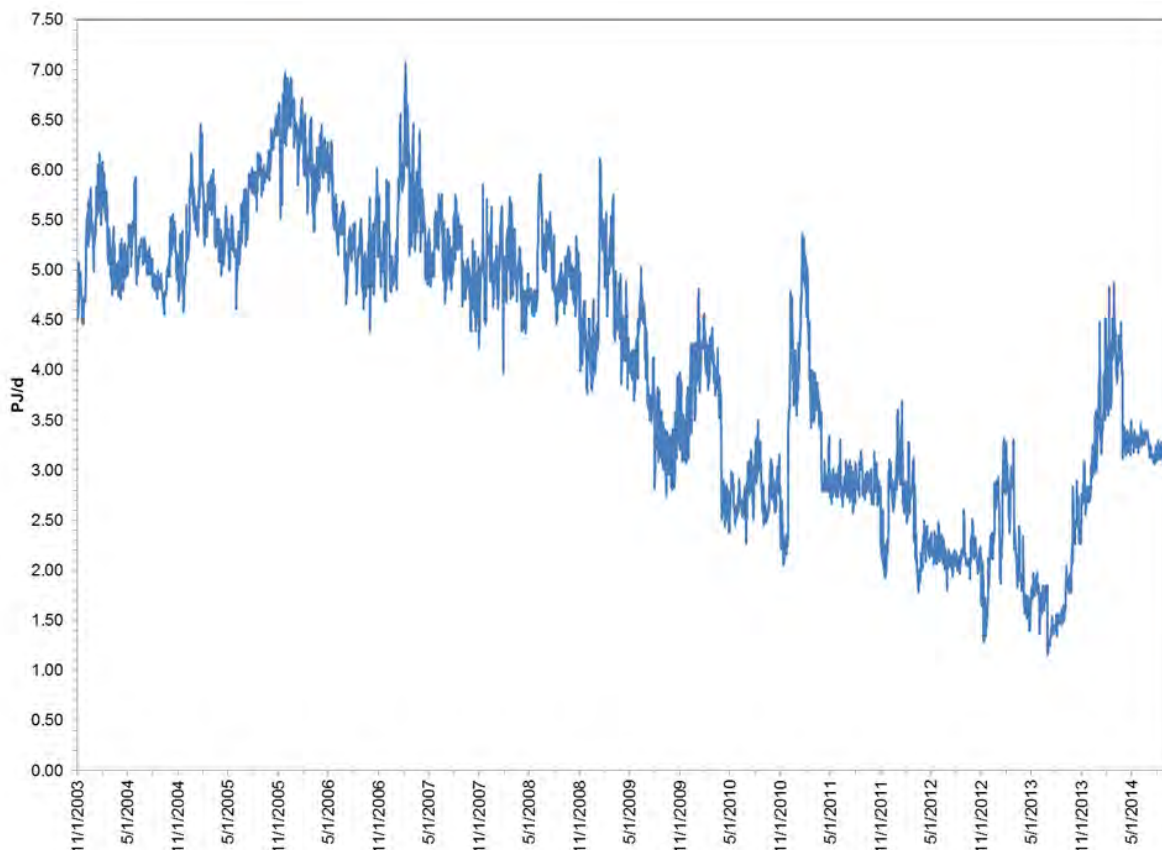


As illustrated in Figure 6, natural gas exports at Niagara peaked at 1.2 PJ per day in 2000 and remained reasonably constant until 2008. Starting in 2009, the export volumes declined sharply and in 2011, natural gas was imported into Canada at Niagara. This reversed in flow is due to the influx of natural gas from the U.S. displacing traditional supplies from the WCSB that were transported east via the TransCanada Mainline/Great Lakes and Alliance/Vector pipeline systems. For example, analysts at Raymond James noted that in 2000, TransCanada's Mainline was fully utilized at approximately 7.4 PJ per day, but volumes fell to less than 2.65 PJ per day in 2012.²⁰ Figure 7 (below) presents the nominated deliveries at Empress (i.e., the interconnection between Nova Gas Transmission and the TransCanada Mainline) between 2007 and 2014.

¹⁹ U.S. Energy Information Administration, http://tonto.eia.gov/dnav/ng/hist/na1287_yusni-nca_2m.htm.

²⁰ Seasonal, Regional Price Impact from Marcellus Spreading to Western Canada, Says Raymond James, Natural Gas Intelligence, January 27, 2014.

Figure 7: TransCanada Mainline Nominated Deliveries (2007-August 2014)²¹



As shown in Figure 7, the nominated deliveries at Empress were relatively constant (i.e., approximately 5 PJ per day) between 2003 and 2008. However, since 2009 the daily volumes at Empress have declined to below 2 PJ per day in 2012 before increasing in 2013 and 2014. The decline from 5 PJ per day to 2 PJ per day is an approximately 60 percent reduction in flows. In addition, the nominated deliveries during the recent years have more variability.

Further, multiple pipeline projects are proposed to transport natural gas from the Marcellus and Utica shale basins west and north to Dawn and markets in the mid-continent region. These proposed natural gas transmission projects will likely further displace WCSB production from Chicago and Dawn (e.g., potentially reducing west to east flows of natural gas on Great Lakes and Vector).

²¹ Source: Union Gas Limited, Empress Sendout.xls.

The Rocky Mountains Express pipeline (“REX”) is one example of the effect of increasing natural gas production in the Marcellus and Utica basins. REX entered commercial service in 2009 to transport approximately 1.89 PJ per day of natural gas from the U.S. Rocky Mountains region to Midwestern and Eastern markets.²² Recently, REX received 1.26 PJ per day of binding, firm transportation commitments to reverse the flow on the eastern portion of the pipeline, thus enabling shippers to transport natural gas from Clarington, Ohio to several interconnections in the Midwest (e.g., REX Zone 3).²³ Similarly, pipelines that interconnect with REX to move natural gas to markets north (including Dawn via the ANR Pipeline and Panhandle Eastern Pipe Line Company) and south of REX are experiencing strong demand for their capacity.²⁴ In combination, these projects would further reduce the demand for natural gas from the WCSB and natural gas transported from west to east on pipelines such as Great Lakes. In 2013, the NEB noted that shipments from the WCSB to Chicago and Dawn were expected to decline from 2.94 PJ per day in 2010 to between 2.21 PJ and 2.33 PJ per day by 2020, a reduction of approximately 21 percent.²⁵

Secondly, as shown in Figure 8 (below), the demand for natural gas within the WCSB is increasing. In a 2013 report, the NEB noted that the demand for natural gas in the WCSB has increased every year since 2005. More specifically, the NEB noted that WCSB regional demand increased from 4.83 PJ per day in 2006 to 5.99 PJ per day in 2012, an increase of nearly 25 percent.²⁶ The NEB attributes this growth in consumption to increased natural gas demand by the oil sands industry. The NEB also noted that increased demand for natural gas in the WCSB region would result in a reduction in WCSB natural gas available for inter-regional shipment.²⁷

²² Tallgrass Energy – Assets – Rocky Mountains Express, <http://www.tallgrassenergy.com/Pipelines/REX/E2W/>, accessed July 23, 2014.

²³ <http://www.tallgrassenergy.com/Pipelines/REX/E2W/>

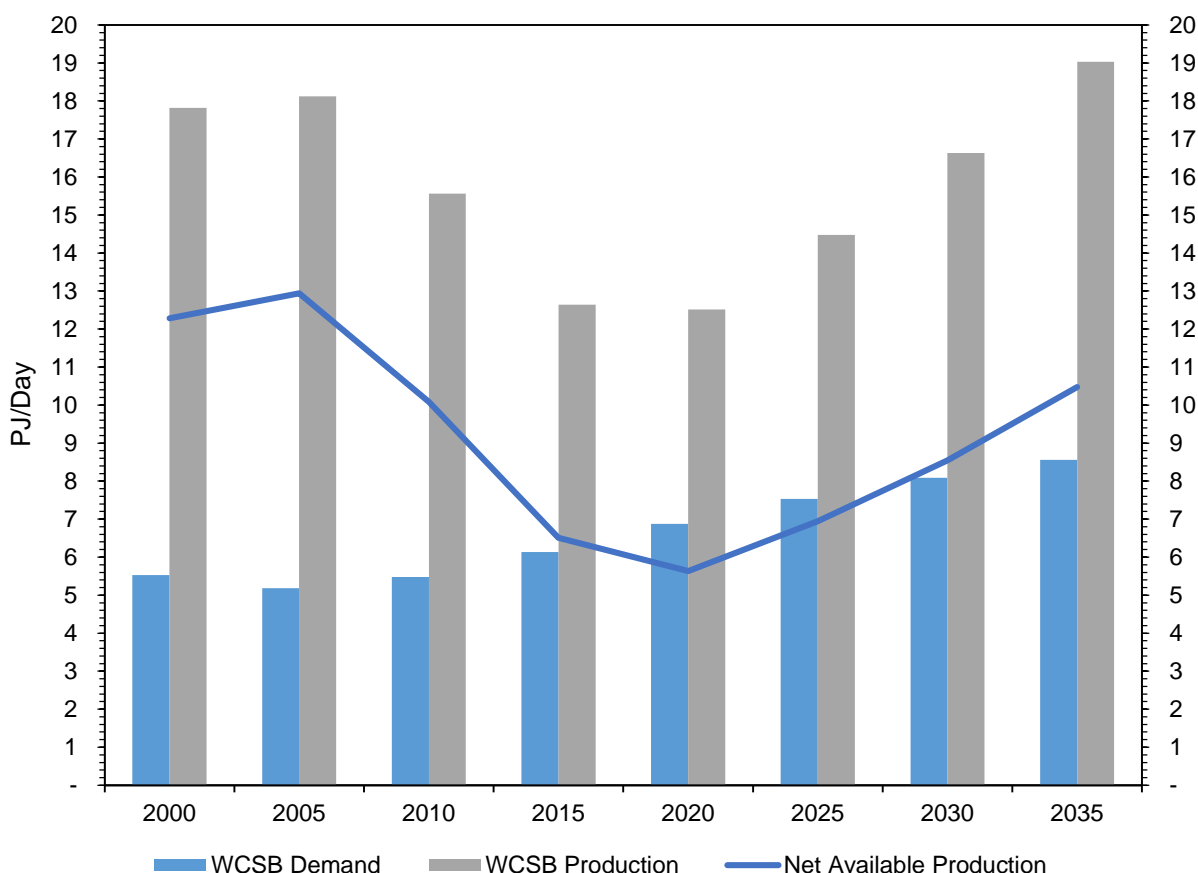
²⁴ See for example, *ANR receives 2 Bcf per day of shipper commitments for SEMI* [Southeast Main Line], Oil & Gas Journal, March 31, 2014. ANR, a pipeline owned by TransCanada and interconnecting with REX, received 2 Bcf day of firm commitments with average term of 23 years to transport Appalachian basin natural gas to markets north and south of REX.

²⁵ Vector is able to source WCSB gas through interconnections with the Northern Border Pipeline. Source: Reasons for Decision – TransCanada Pipelines Limited, Nova Gas Transmission Ltd., and Foothills Pipe Lines Ltd., RH-003-2011, National Energy Board of Canada, March 2013, at 158.

²⁶ *Canada's Energy Future 2013 – Energy Supply & Demand Projections to 2035*, National Energy Board of Canada, November 2013, at 15.

²⁷ Ibid.

Figure 8: WCSB Regional Production & Consumption (2005-2012) ²⁸



As shown in Figure 8, from 2000 through 2020 increased consumption of natural gas within the WCSB region, coupled with reduced natural gas production, has resulted in projections of less natural gas available for other markets including Ontario. For example from 2000 to 2005, the net available production was in excess of 12 PJ per day; however, the NEB forecasts the net available production will decline to less than 6 PJ per day by 2020. The net available production is expected to recover to approximately 11 PJ per day by 2035. As described below, much of that recovery in the net available production from the WCSB is expected to find its way to markets in Western North America.

²⁸ *Canada's Energy Future 2013 – Energy Supply & Demand Projections to 2035*, Appendix 2: Energy Demand & Appendix 4: Natural Gas. WCSB demand is calculated as the sum of the total end use natural gas demand for Saskatchewan, Alberta, and British Columbia. WCSB production is the total annual WCSB production.

The Alberta Energy Regulator (“AER”) has provided natural gas production projections similar to the forecasts from the NEB, but focused solely on Alberta. More specifically, the AER has noted that demand in Alberta was approximately 5.4 PJ per day in 2013 and represented approximately 50 percent of the total Alberta production.²⁹ The AER expected demand to reach 7.2 PJ per day or approximately 78 percent of the total Alberta production by 2023.³⁰ The AER similarly forecasted that available natural gas for export from Alberta would decline from approximately 12 PJ per day in 2000 to approximately 2.1 PJ per day in 2023.³¹

Finally, the NEB has approved fourteen LNG export facilities along the coast of British Columbia, and there are two other facilities proposed along the Oregon coast. A list of these facilities is presented in Appendix B. The proposed LNG export facilities are expected to encourage WCSB producers to restart production by creating additional demand and price support for natural gas. However, the additional natural gas production is unlikely to increase the flow of natural gas on pipelines that serve demand in Eastern Canada since the new source of demand will be located to the west in British Columbia and Oregon.

In aggregate, the combined effects of increased WCSB demand for natural gas (i.e., oil sands production and LNG export facilities in British Columbia), coupled with decreased production from the WCSB, are expected to reduce the flow of natural gas from the WCSB to Eastern Canada and the U.S. By way of example, Ziff Energy Group, in a report prepared for the NEB, noted that it expects the volume of natural gas transported from the WCSB to eastern North America to decline from approximately 6.3 PJ per day in 2010 to 2.12 PJ per day in 2050, a decline of nearly 67 percent. The decrease is due, in part; to 11.7 PJ per day of new LNG demand on Canada’s west coast.³² The effects of the reduced WCSB production and increased

²⁹ The AER notes that the remainder of the natural gas production went to other Canadian provinces and the U.S. *Canada’s Energy Future 2013 – Energy Supply & Demand Projections to 2035*, National Energy Board of Canada, November 2013, at 5-51.

³⁰ The Alberta Gas Preservation Act requires Alberta to ensure sufficient supplies of natural gas are available to serve domestic demand prior to permitting shipments from the province. See *Alberta’s Energy Reserves 2013 and Supply/Demand Outlook 2014-2023*, ST98-2014, Alberta Energy Regulator, at 5-46.

³¹ *Alberta’s Energy Reserves 2013 and Supply/Demand Outlook 2014-2023*, ST98-2014, Alberta Energy Regulator, at 5-51.

³² *Long Term Natural Gas Supply and Demand Forecast to 2050 – North America and Canada*, Ziff Energy Group, November 16, 2013, at 40-41. 6.0 Bcf/d consists of 1.2 Bcf/d transferred across Canada and 4.8 Bcf/d transported across the U.S. Upper Midwest.

intra-WCSB consumption on the shipment of natural gas on each of the Upstream Pipelines are described in the following section.³³

Great Lakes Overview

Great Lakes is owned by TransCanada and its affiliates, and entered service in 1967.³⁴ Great Lakes originates near the Manitoba-Minnesota border at Emerson extending approximately 1,700 km to St. Clair (i.e., the border of Michigan and Ontario) where it interconnects with the TransCanada Mainline system.³⁵ Great Lakes connects natural gas produced in the WCSB with markets in Eastern Canada and the upper US Midwest. Figure 9 provides a map of the Great Lakes system and its interconnecting pipelines.

Figure 9: Great Lakes System Map³⁶



³³ In addition, other pipeline companies are experiencing the impact of declining natural gas transportation volumes. ANR recently executed a firm transportation agreement with Great Lakes for back-haul service from Farwell, Michigan to Fortune Lake, Michigan. This agreement was executed in response to declining natural gas flows on Great Lakes. ANR had previously used a displacement agreement with TransCanada and Great Lakes to divert natural gas at Fortune Lake, Michigan and replace the diverted supply with natural gas from ANR's storage assets in Farwell, Michigan. However, due to TransCanada's decision to reduce its firm transportation capacity on Great Lakes, ANR no longer believes it can rely on the displacement agreement, and has instead executed an agreement for firm back-haul transportation. Source: Request for Rehearing of ANR Pipeline Company before the U.S. Federal Energy Regulatory Commission, ANR Pipeline Company, Docket RP13-743-000, at 4-5.

³⁴ Great Lake Gas Transmission Limited Partnership – Company Information, http://www.GreatLakes.com/1_frame.htm, accessed July 12, 2014. The total GLGT transmission system includes approximately 3,400 km of transmission pipeline including pipeline loops and interconnecting laterals.

³⁵ Ibid.

³⁶ Great Lake Gas Transmission Limited Partnership – Company Information, http://www.glgt.com/pipeline/pipe_map.htm, accessed July 12, 2014.

With respect to the market dynamics discussed previously, the Great Lakes system has experienced an overall reduction in west to east flows as well as large fluctuations in daily volumes. These volume changes are noted in the 2013 TCPL Annual Report, which indicates that TCPL expects Great Lakes to continue to contract on a largely short-term, short-haul basis.³⁷

A review of the Great Lakes Index of Shippers provides support for the trend of declining shipments and short-term agreements. Specifically, 872 TJ per day of Great Lakes capacity is contracted for delivery at St. Clair, of which 702 TJ per day, or 81 percent, is held by marketers/producers.³⁸ In addition, all of the contracted capacity expires between 2014 and 2016. Of particular note is the Great Lakes agreement with TransCanada that is scheduled to expire in the fall of 2014. This contract is related to TransCanada's Transportation by Others agreement with Great Lakes, and the contracted daily capacity has declined from 987 TJ per day in 2011 to 105 TJ per day in 2014, a reduction of approximately 90 percent.³⁹

In addition to the deliveries to St. Clair, there is approximately 500 TJ per day of St. Clair receipts held by TransCanada.⁴⁰ This contract allows GLGT to receive natural gas at Dawn (through TransCanada) and at times, reverses the flow of natural gas on GLGT.

Vector Overview

Vector is a 560-km natural gas pipeline with a capacity of approximately 1.9 PJ per day from Joliet, Illinois through Indiana and Michigan to Dawn.⁴¹ Vector entered service in December 2000 and is jointly owned by Enbridge Inc. ("Enbridge") and DTE Energy Company.⁴² A map of Vector is provided as Figure 10 (below).

³⁷ 2013 Annual Report of TCPL, LP, at 32. TCPL is a Master Limited Partnership and affiliated with TransCanada and owns 46.45 percent of Great Lakes. Source: <http://www.tcpipelineslp.com/great-lakes-transmission.html>.

³⁸ Great Lakes Index of Shippers, access July 1, 2014.

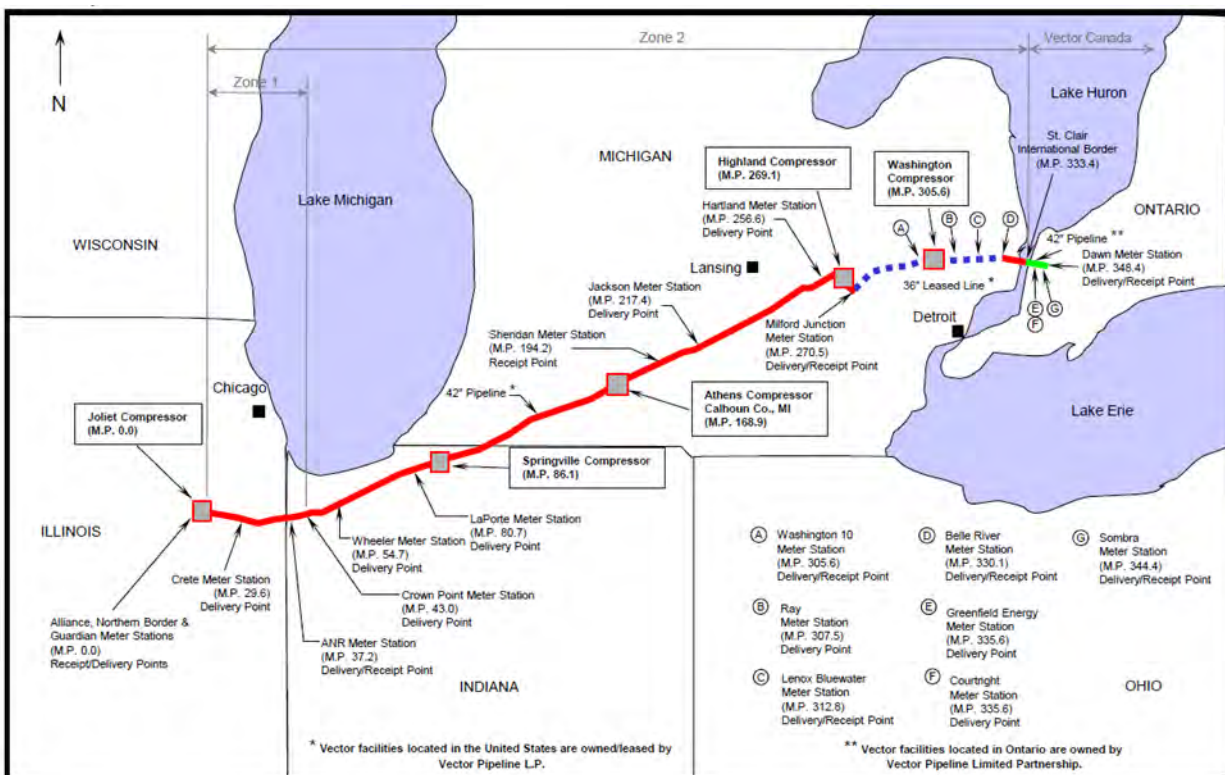
³⁹ Ibid.

⁴⁰ Ibid.

⁴¹ Vector Pipeline – About Vector, Vector Pipeline, www.vector-pipeline.com/About-Us/About-Vector/, Accessed July 14, 2014 and Union Gas Limited.

⁴² Ibid.

Figure 10: Vector System Map⁴³



Vector's origination point (i.e., Joliet, IL) is a major pipeline interconnection point, permitting access to several pipelines and natural gas supply basins. These supply basins include the WCSB, the Mid-Continent and the U.S. Gulf Coast. Current forecasts indicate that certain natural gas supplies from all three regions are likely to be displaced by surplus natural gas production from the Marcellus and Utica regions in the short and medium term.⁴⁴ Further, Enbridge recently noted that "natural gas pipeline capacity out of the WCSB exceeds supply..., Vector [has] been unaffected by this excess supply environment mainly because of long-term capacity contracts extending primarily to 2015; however, excess supply and depressed natural

⁴³ Vector Pipeline, <http://www.vector-pipeline.com/WorkArea/downloadasset/6778/Vector-System-Map-4-08.aspx>, accessed July 14, 2014.

⁴⁴ 'Rolling Tsunami' of cheap Northeast gas to swamp other regions, analyst says, SNL Financial, LLC, June 5, 2014.

gas prices...could negatively impact re-contracting beyond this term.”⁴⁵ Enbridge went on to note that:

Excess supply and depressed natural gas prices have led to a reduction or deferral of investment in upstream gas development and could negatively impact re-contracting beyond this period. Additionally, increased supply from new shale developments including the Marcellus shale formation, which is among the largest plays in North America, could displace gas from the WCSB to the [U.S.] Midwest further increasing re-contracting risk.⁴⁶

Both of the statements from Enbridge note a risk of declining volumes on Vector, particularly post-2015. In addition, 68 percent of the contracted volumes on Vector, with a delivery point of St. Clair, are marketers and producers with short-term contracts.⁴⁷ Six contracts on Vector, representing approximately 33 percent of the contracted capacity, are scheduled to expire in 2014 and 2015; and an additional 13 contracts, or 55 percent of the committed capacity, terminate in 2016 and 2017.⁴⁸ Recently, pipeline projects have been announced that could provide Marcellus and Utica gas supplies to Vector and could offset the expected decline in volumes.

MichCon Overview

The MichCon natural gas transmission and distribution system is wholly owned by DTE Energy, Inc. and consists of approximately 4,200 kilometers of transmission pipelines.^{49,50} The MichCon system generally connects storage fields in northern Michigan with interstate pipelines in southeastern Michigan (e.g., ANR, Panhandle, Great Lakes, and Vector).⁵¹ In addition to the interstate pipeline interconnections, MichCon also connects to local distribution companies (e.g.,

⁴⁵ Management Discussion and Analysis, Enbridge Inc. December 31, 2013, at 50. Enbridge earlier noted that 87 percent of its capacity is committed through November 2015 and that shippers representing approximately 20 percent of its long haul capacity have elected to extend their beyond December 1, 2016 with additional compensation if those agreements are not extend through November 30, 2020. Ibid.

⁴⁶ Ibid.

⁴⁷ Vector Pipeline Index of Shippers, accessed July 1, 2014. For purposes of this analysis, Sussex has assumed that the volumes delivered to the St. Clair border point are delivered into Canada on Vector Canada.

⁴⁸ Ibid.

⁴⁹ DTE Energy – MichCon Storage & Transportation, <http://mcsts.dteenergy.com/aboutUs.html>, accessed August 14, 2014.

⁵⁰ The MichCon system is operated as an intrastate pipeline system and subject to regulation by the Michigan Public Service Commission and is not required to provide the same informational postings as FERC or NEB pipeline. Source: DTE Energy Inc., SEC Form 10-K for the year ending December 31, 2013 at 11.

⁵¹ Ibid.

Consumers Gas and Union) and other storage providers (e.g. Washington 10 and Bluewater).⁵² These various interconnections allow MichCon to provide transportation and storage services to various market participants.⁵³ A map of the MichCon system is provided as Figure 11 (below).

Figure 11: MichCon Transmission System⁵⁴



In a 2012 application before the Michigan Public Service Commission, MichCon noted that the value of its transportation service was depressed due to declining basis differentials and increased availability of natural gas from the Marcellus and Utica shale basins.⁵⁵ MichCon noted that it was not entering into long-term contracts for all of its available transportation capacity because the current value of that capacity was estimated to be approximately 50 percent less than was achieved in previous years.⁵⁶

⁵² Ibid.

⁵³ Direct Testimony of Robert D. Feldman, Michigan Public Service Commission, Docket U-16999, at 23-32.

⁵⁴ <http://mcsts.dteenergy.com/pdfs/stateWideGasSystemMap.pdf>, accessed August 14, 2014.

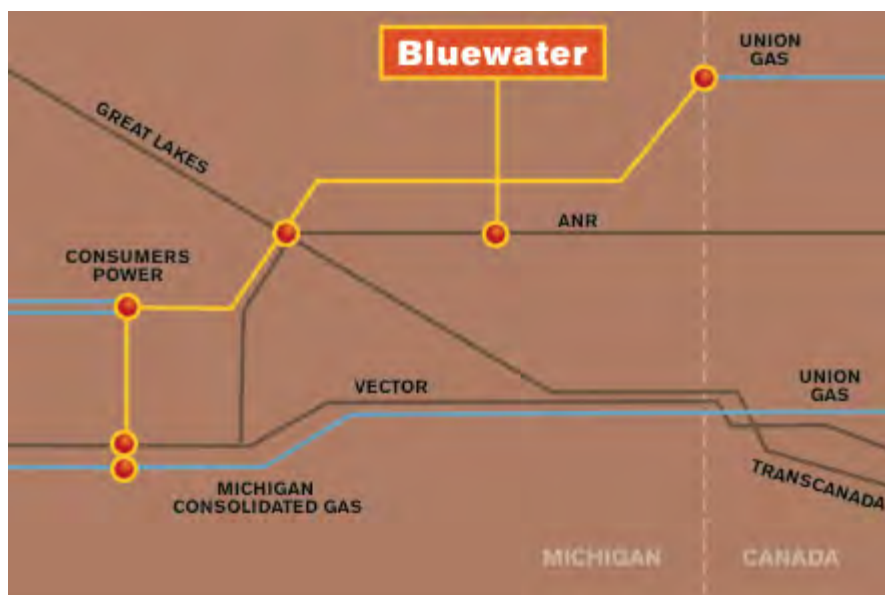
⁵⁵ Direct Testimony of Robert D. Feldman, Michigan Public Service Commission, Docket U-16999, at 26-32.

⁵⁶ Ibid., at 28.

Bluewater Gas Storage

Bluewater is located in St. Clair County, Michigan, and primarily provides a seasonal natural gas storage service. Bluewater has total working gas storage capacity of approximately 29.4 PJ in two depleted reservoirs.⁵⁷ A map of the Bluewater Storage System is provided as Figure 12.

Figure 12: Bluewater Storage



In addition to its storage facilities, Bluewater owns a 20-inch diameter pipeline header system that connects with three interstate and three intrastate natural gas pipelines and provides access to Chicago and Dawn.

A review of Bluewater's Index of Shippers indicates that approximately 70 percent of its contracted storage capacity is due to expire by 2016, with the remaining storage contracts set to expire in 2018.⁵⁸ In terms of the counterparties contracting for storage capacity, nearly 46 percent is committed to marketing companies;⁵⁹ pipeline companies contract a further 18 percent, while local distribution companies, including Enbridge Gas Distribution, Inc., hold approximately 36 percent of the committed storage capacity.⁶⁰

⁵⁷ <http://www.pnglp.com/our-assets/bluewater-gas-storage/>

⁵⁸ Bluewater Gas Storage, LLC, Index of Customers.

⁵⁹ Ibid.

⁶⁰ Ibid.

III. Review of Sussex Analysis

To evaluate the effect of the market trends on the Upstream Pipeline deliveries to Dawn and to assess if this trend will continue, Sussex conducted the following analyses:

1. Basis Differential Analysis – An analysis that evaluates the market incentives to transport natural gas to various interconnected trading hubs;
2. Physical Flow Analysis – An evaluation of the volumes of natural gas transported to Dawn via the Upstream Pipelines; and
3. Risk Assessment Analysis – An evaluation of the risk associated with relying on assets not controlled by Union to meet the Supply Requirement.

These analyses and the associated results are discussed below.

Basis Differentials Analysis

The Basis Differential analysis considers the economic, or market price, signals that incent natural gas shippers to transport natural gas between certain points.⁶¹ When the price of natural gas at one trading hub exceeds the price of natural gas at a separate trading hub, including the marginal cost of transportation (e.g., pipeline fuel and variable charges), shippers have an economic incentive to transport natural gas to the higher-priced trading hub to maximize the price received for their product. Conversely, when the basis differential is insufficient to overcome the marginal cost of transportation, shippers lack an economic incentive to transport natural gas between locations.

For the Dawn and Sarnia regions, the basis differential has historically incented the transportation of natural gas from production basins in the WCSB, Mid-Continent and the U.S. Gulf Coast (i.e., lower priced points) to consuming regions in Michigan and Ontario including the Dawn Hub (i.e., higher price points). However, in certain situations, that incentive has decreased to below marginal cost (i.e., reducing or eliminating the incentive to ship natural gas to Dawn) incenting natural gas transportation to other points or away from Dawn.⁶²

⁶¹ The cost of transporting natural gas between points mitigates the economic incentive to move natural gas to the higher price trading point in that the price differential must overcome the marginal cost of transporting natural gas to the higher price point.

⁶² For purposes of this report, days on which the Dawn price did not exceed the sum of the marginal transportation cost and the receipt point (i.e., Emerson, Chicago, or MichCon) price of gas are referred to as inverted basis days.

To conduct the basis differential analysis, Sussex considered the price differentials between certain points and the Dawn Hub. Specifically:

1. Emerson⁶³ to Dawn basis (reflects Great Lakes capacity values);
2. Chicago to Dawn basis (reflects Vector capacity values); and
3. MichCon Detroit City Gates to Dawn basis (reflects MichCon and Bluewater capacity values).⁶⁴

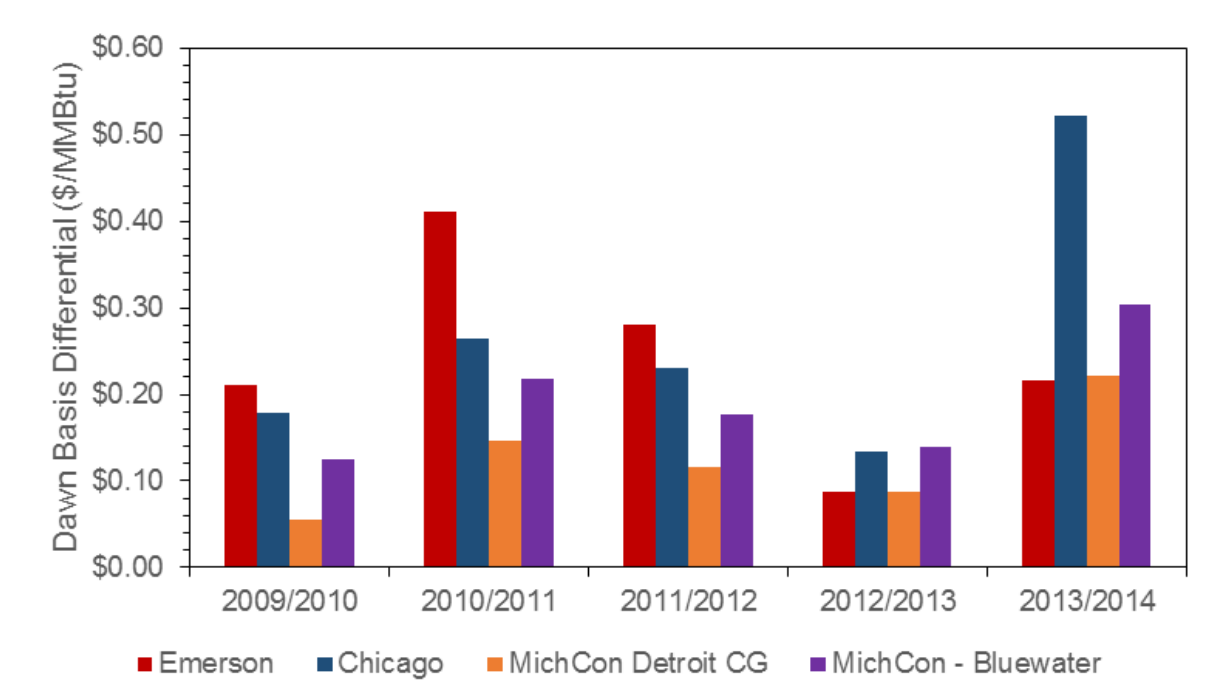
These basis differentials are representative of the price signals that shippers on the Upstream Pipelines would have likely experienced during the analysis period (i.e., June 2010 to August 2014). In addition, Sussex calculated the marginal cost of transportation between the receipt and delivery points based on historical pipeline fuel and variable charges. That marginal transportation cost was added to the receipt point price (i.e., Emerson, Chicago, or MichCon) prior to calculating the basis differentials. As shown in Figure 13, the basis differentials to Dawn, on average, indicates an incentive to move gas to Dawn (i.e., the Dawn price is greater than the receipt point price plus transport and fuel).⁶⁵

⁶³ Emerson is the interconnection point between the TransCanada Mainline and Great Lakes.

⁶⁴ The MichCon Detroit City Gates to Dawn basis differential was used as a proxy for the Bluewater to Dawn basis differential. However, MichCon and Bluewater charge different fuel and variable charges, thus, the basis differential is analyzed separately for each pipeline.

⁶⁵ While the analyses performed by Sussex considered the economic incentive to ship gas to or away from Dawn, certain shippers (i.e., local distribution companies) may have supply obligations that require them to ship natural gas on the Upstream Pipelines regardless of the price differentials.

Figure 13: Historical Basis Differentials to Dawn⁶⁶



Although the basis differential to Dawn from Emerson, Chicago, MichCon, and Bluewater have, on average, been positive, there are numerous inverted basis days. On an inverted basis day, the price signal would not provide an economic incentive to move gas to Dawn from Emerson, Chicago or Michigan.

As indicated in Table 2, there have been an increasing number of observations where the Emerson to Dawn basis differential has inverted (i.e., the basis differential is less than or equal to zero).

⁶⁶ Source: SNL Financial, LLC, 2013/14 data provided through August 31, 2014.

Table 2: Emerson to Dawn Basis Differential Frequency Distribution⁶⁷

Emerson to Dawn Basis Differential (\$/MMBtu)		Number of Days				
		2009/2010	2010/2011	2011/2012	2012/2013	2013/2014*
Greater than or equal to	\$10.00	0	0	0	0	1
Greater than or equal to	\$5.00	0	0	0	0	1
Greater than or equal to	\$2.00	0	0	0	0	7
Greater than or equal to	\$1.00	0	0	0	0	18
Greater than or equal to	\$0.50	89	2	0	0	43
Greater than or equal to	\$0.25	203	287	85	98	60
Greater than	\$0.00	359	365	359	301	262
Less than or equal to	\$0.00	6	0	6	64	42

* 2013/2014 data through August 31, 2014

Table 2 demonstrates that over the 2009/2010 to 2011/2012 time period there were only 12 observations less than or equal to zero, or approximately 1 percent of the time; however in 2012/2013 that number increased significantly to 64, or 18 percent of the time. In the current year (i.e., 2013/2014) there are already 42 observations, or 14 percent of the time, when the basis differential is less than or equal to zero. Stated differently, during 2012/2013 and 2013/2014, there were many days when the Emerson to Dawn basis differential was inverted, providing an economic incentive to either not transport natural gas to Dawn or to transport natural gas away from Dawn.

The Chicago to Dawn basis differential has typically provided incentive for Vector shippers to transport natural gas to Dawn. Yet there are numerous days in each year when the basis differential is inverted (i.e., is less than zero) and Vector shippers were incented to transport gas from Dawn to Chicago. Table 3 demonstrates the frequency with which this incentive was reversed (i.e., the number of days with a basis differential less than or equal to zero). Similar to the Emerson to Dawn basis differential, the Chicago to Dawn basis differential during 2012/2013 and 2013/2014 had the highest number of basis observations (i.e., 24 and 60 observations respectively) less than or equal to \$0.00.

⁶⁷ Source: SNL Financial, LLC, 2013/14 data provided through August 31, 2014.

Table 3: Chicago to Dawn Basis Differential Frequency Distribution⁶⁸

Chicago to Dawn Basis Differential (\$/MMBtu)		Number of Days				
		2009/2010	2010/2011	2011/2012	2012/2013	2013/2014*
Greater than or equal to	\$10.00	0	0	0	0	4
Greater than or equal to	\$5.00	0	0	0	0	18
Greater than or equal to	\$2.00	0	0	0	0	31
Greater than or equal to	\$1.00	0	0	0	0	42
Greater than or equal to	\$0.50	1	11	4	0	56
Greater than or equal to	\$0.25	143	118	130	140	69
Greater than	\$0.00	345	354	358	341	244
Less than or equal to	\$0.00	20	11	8	24	60

* 2013/2014 data through August 31, 2014

As illustrated in Table 3, there were 60 days, or 20 percent of the observations, in 2013/2014 when the basis differential between Chicago and Dawn was less than or equal to \$0.00, thus providing an economic incentive to either not transport natural gas to Dawn or to transport natural gas away from Dawn.

Consistent with the Emerson to Dawn and Chicago to Dawn basis differentials, the MichCon to Dawn basis differential had the highest number of basis observations (i.e., 163 observations) in the less than or equal to \$0.00 category during 2013/2014. Please see Table 4.

Table 4: MichCon to Dawn Basis Differential Frequency Distribution⁶⁹

MichCon-Dawn Basis Differential (\$/MMBtu)		Number of Days				
		2009/2010	2010/2011	2011/2012	2012/2013	2013/2014*
Greater than or equal to	\$10.00	0	0	0	0	1
Greater than or equal to	\$5.00	0	0	0	0	4
Greater than or equal to	\$2.00	0	0	0	0	18
Greater than or equal to	\$1.00	0	0	0	0	34
Greater than or equal to	\$0.50	0	1	0	0	42
Greater than or equal to	\$0.25	21	29	34	16	55
Greater than	\$0.00	348	326	358	354	141
Less than or equal to	\$0.00	17	39	7	11	163

* 2013/2014 data through August 31, 2014

As illustrated in Table 4, over the 2009/10 to 2012/13 time period there were less than 75 observations when the basis differential between MichCon and Dawn was less than or equal to zero, or approximately 5 percent of the time; however, in 2013/14 the number of basis differentials less than or equal to zero increased to 163, or approximately 54 percent of the time.

⁶⁸ Source: SNL Financial, LLC, 2013/14 data provided through August 31, 2014.

⁶⁹ Source: SNL Financial, LLC, 2013/14 data provided through August 31, 2014.

Similar to the previous transportation paths, the Bluewater to Dawn basis differential in 2013/14 had the most observations where the value is less than or equal to zero.

Table 5: Bluewater to Dawn Basis Differential Frequency Distribution⁷⁰

Bluewater-Dawn Basis Differential (\$/MMBtu)		Number of Days				
		2009/2010	2010/2011	2011/2012	2012/2013	2013/2014*
Greater than or equal to	\$10.00	0	0	0	0	1
Greater than or equal to	\$5.00	0	0	0	0	4
Greater than or equal to	\$2.00	0	0	0	0	18
Greater than or equal to	\$1.00	0	0	0	0	34
Greater than or equal to	\$0.50	0	8	0	0	49
Greater than or equal to	\$0.25	71	70	99	75	67
Greater than	\$0.00	364	365	365	365	270
Less than or equal to	\$0.00	1	0	0	0	34

* 2013/2014 data through August 31, 2014

As shown in Table 5, Bluewater experienced only a single inverted basis day between 2009/10 and 2012/13; however, in 2013/14 Bluewater has experienced 34 inverted basis days, (i.e., 11 percent of the time).⁷¹

Overall, the Upstream Pipelines have experienced numerous observations where the basis differentials to Dawn are less than or equal to zero, thus providing an incentive to either not deliver natural gas to Dawn or to move natural gas from Dawn to other locations. Further to this point, there were 88 days between June 2010 and August 2014 when two of the Upstream Pipelines simultaneously experienced a basis inversion, 21 days when three of the Upstream Pipelines simultaneously experienced a basis inversion, and one day when all four of the Upstream Pipelines simultaneously experienced a basis inversion.

In addition, the number of observations in the less than or equal to zero category has increased significantly over the past two years. As a result, there are increasingly more days when the price of natural gas at Dawn relative to Emerson, Chicago and Michigan may not be sufficient to incent shipments to Dawn. The increasing number of inverted basis observations, coupled with the level of pipeline capacity contracted by entities focused on daily optimization (e.g., energy

⁷⁰ Source: SNL Financial, LLC, 2013/14 data provided through August 31, 2014.

⁷¹ Although, the MichCon Detroit City Gates pricing point is used as a proxy for both the MichCon and Bluewater basis analyses, Bluewater and MichCon differ in the calculated basis differential due to the differences in the marginal transportation cost.

marketers) could result in more days when the capacity holder opts to either not to deliver to Dawn or transport natural gas away from Dawn.

Physical Flows Analysis

In addition to the basis differential analysis (i.e., days when the price spread to Dawn was less than or equal to zero), Sussex conducted an analysis of the physical flows of natural gas on the Upstream Pipelines. The Sussex physical flow analysis reviews the daily flows to and from Dawn on the Upstream Pipelines and whether that daily flow was sufficient to meet the Supply Requirement or the Design Day Demand. This analysis reviews the flows of natural gas on each of the Upstream Pipelines, and on a total volume basis.

As discussed previously, there are two components to the Supply Requirement (i.e., the Design Day Demand and the S&T Contracts). The first component (i.e., Design Day Demand) is met by a combination of flows on the Upstream Pipelines (i.e., Great Lakes, Vector, MichCon and Bluewater) and from a limited volume of Union storage and transmission that is directly connected to the Sarnia Industrial Line. However, there are certain interconnect capacity limits on the Upstream Pipelines with respect to deliveries to the Sarnia Industrial Line to meet the Design Day Demand.⁷² The second component of the Supply Requirement (i.e., the S&T Contracts) are primarily met by flows on Vector to Dawn. The following table is a summary of the ability of the Upstream Pipelines to serve the Design Day Demand (with the interconnection capacity listed) or the S&T Contracts requirement.

Table 6: Summary of Upstream Pipelines⁷³

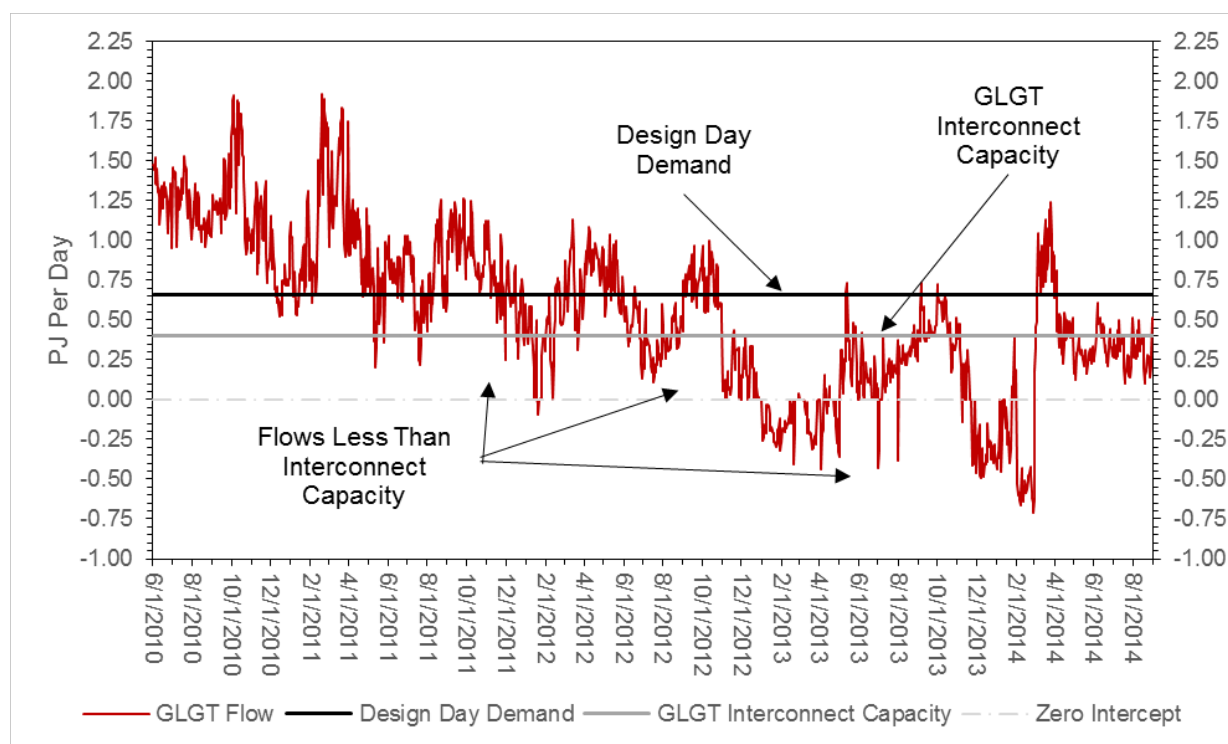
Pipeline	Serve Design Day Demand	Sarnia Industrial Line Interconnect Capacity (PJ/Day)	Serve S&T Contracts
Great Lakes	Yes	0.4	No
Vector	Yes	0.4	Yes
MichCon	Yes	0.16	No
Bluewater	Yes	0.3	No

With regard to the historical daily flows on each individual pipeline, Figure 14 depicts the daily volumes transported on Great Lakes to Dawn between 2010 and 2014.

⁷² These constraints are discussed more fully in the Union evidence.

⁷³ Source: Union Gas Limited.

Figure 14: Great Lakes Natural Gas Shipments (2010 to 2014)⁷⁴



As illustrated in Figure 14, from 2010 to 2011, the flow on Great Lakes was typically well above the interconnect capacity of 0.4 PJ per day.⁷⁵ Specifically, Great Lakes natural gas flows fell below the interconnect capacity of 0.4 PJ per day on 16 days or 3 percent of the days during this period. In the 2012 to 2014 period, there were 619 days, or 64 percent of the total number of days in the period, when the flows on Great Lakes were below the interconnect capacity of 0.4 PJ per day.

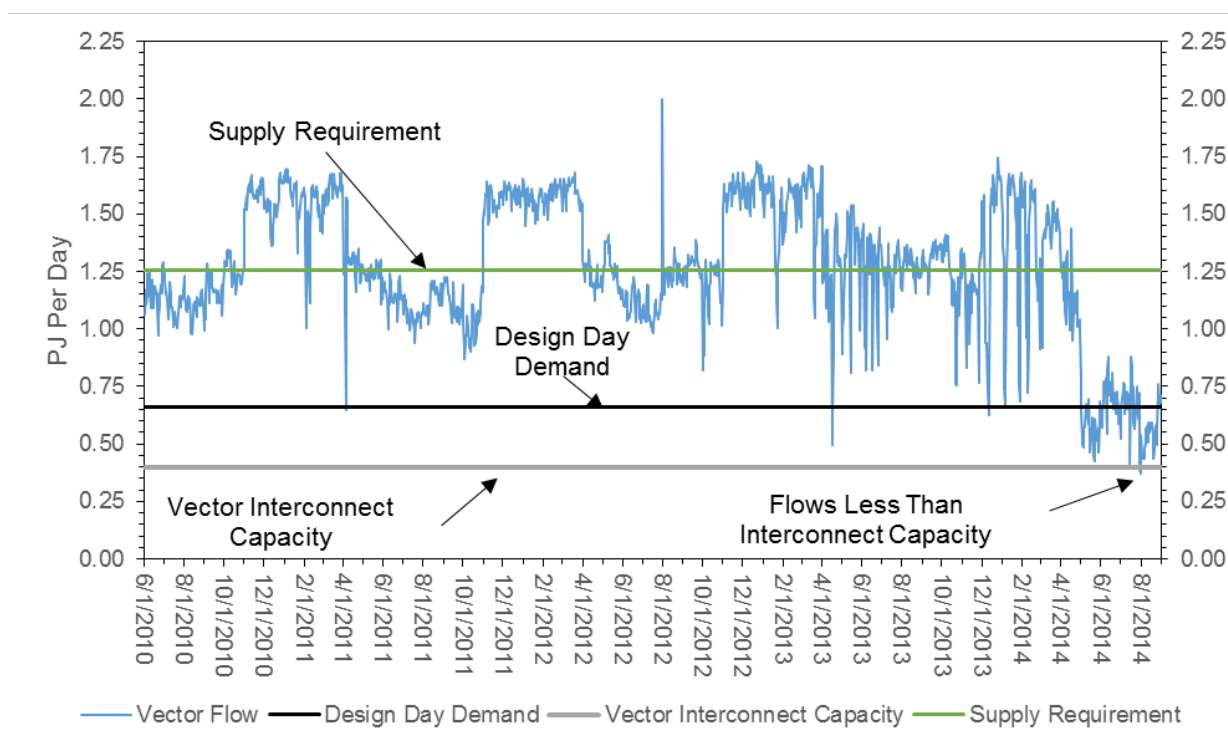
Similar to the Great Lakes physical flow analysis, Sussex reviewed the natural gas volumes shipped on Vector to Dawn between 2010 and 2014. As illustrated in Table 6 (above), Vector is the only pipeline that can supply both components of the Supply Requirement (i.e., Design Day Demand and the S&T Contracts). The Vector/Sarnia Industrial Line interconnect capacity is 0.4 PJ per day.⁷⁶ Please see Figure 15 for a summary of the natural gas shipments on Vector.

⁷⁴ Source: Union Gas Limited.

⁷⁵ The Great Lakes interconnect capacity is based on Union's facilities. Source: Union Gas Limited.

⁷⁶ Source: Union Gas Limited.

Figure 15: Vector Natural Gas Shipments (2010 to 2014)⁷⁷



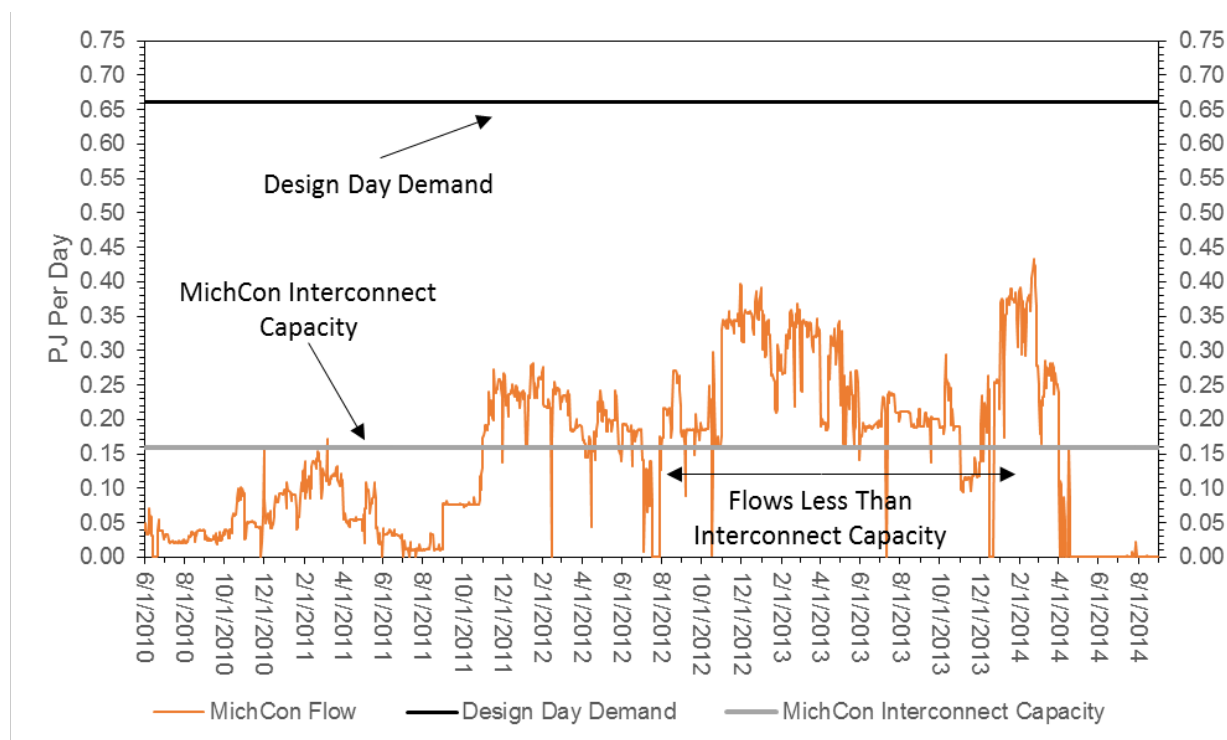
As illustrated in Figure 15, between 2010 and 2012, the Vector flows fluctuated around the Supply Requirement. In 2013 and early 2014, the Vector flows were generally below the Supply Requirement, but above the Design Day Demand. However, in the spring and summer of 2014 the Vector natural gas flows were generally below the Design Day Demand, and in one observation, below the interconnect capacity of 0.4 PJ per day.

Next, Sussex reviewed the daily flows on MichCon. As shown in Table 6 (above), flows on Michcon serve Design Day Demand, and the MichCon interconnect capacity is 160 TJ per day.⁷⁸ In terms of volumes, the flows on MichCon to Dawn have increased between 2010 and 2014, as illustrated in Figure 16. Specifically, deliveries on MichCon increased from about 100 TJ per day in 2010 to about 300 TJ per day in 2013 and 2014. However, there were recent observations (i.e., the summer of 2014) when the daily flow of natural gas declined to zero.

⁷⁷ Source: Union Gas Limited.

⁷⁸ The MichCon interconnect capacity is nominally 0.16 PJ/d based on Union's facilities. Source: Union Gas Limited.

Figure 16: MichCon Natural Gas Shipments (2010 to 2014)⁷⁹

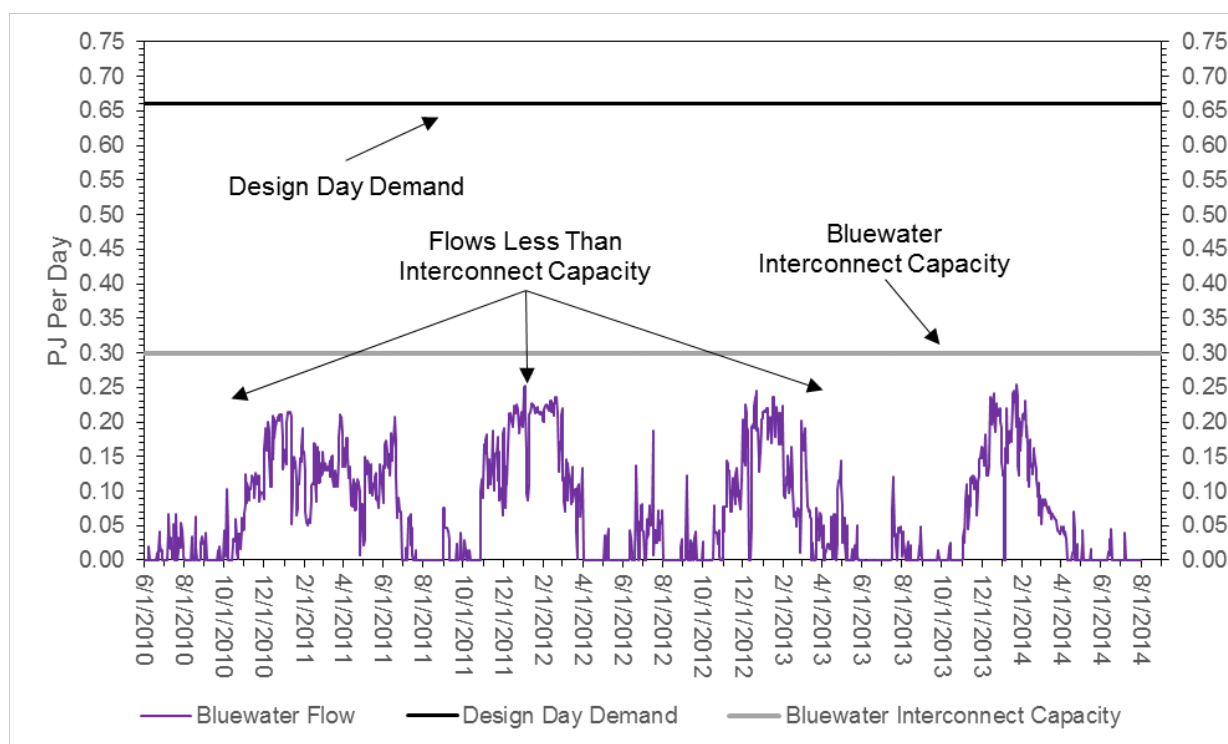


As illustrated in Figure 16, during 2012 and 2013, the flows on MichCon to Dawn were above the 160 TJ per day interconnect capacity, thus on those days MichCon could provide up to 160 TJ per day to serve Design Day Demand. However, since March 2014, the flows on MichCon to Dawn were below the interconnect capacity of 160 TJ per day and, in fact, there were 119 days of zero flow, or nearly 65 percent of the total number of days during this period. On those days, MichCon was providing no supply to meet the Design Day Demand.

Finally, Sussex reviewed the daily flows on Bluewater; and as illustrated in Table 7 (above), volumes on Bluewater can serve Design Day Demand. In terms of daily volumes, Figure 17 (below) presents the natural gas shipments on Bluewater to Dawn between 2010 and 2014. As discussed previously, Bluewater is primarily a storage facility; therefore, the Bluewater flows reflect the seasonal nature of a storage facility (i.e., higher volumes in the winter).

⁷⁹ Source: Union Gas Limited.

Figure 17: Bluewater Natural Gas Shipments (2010-2014)⁸⁰



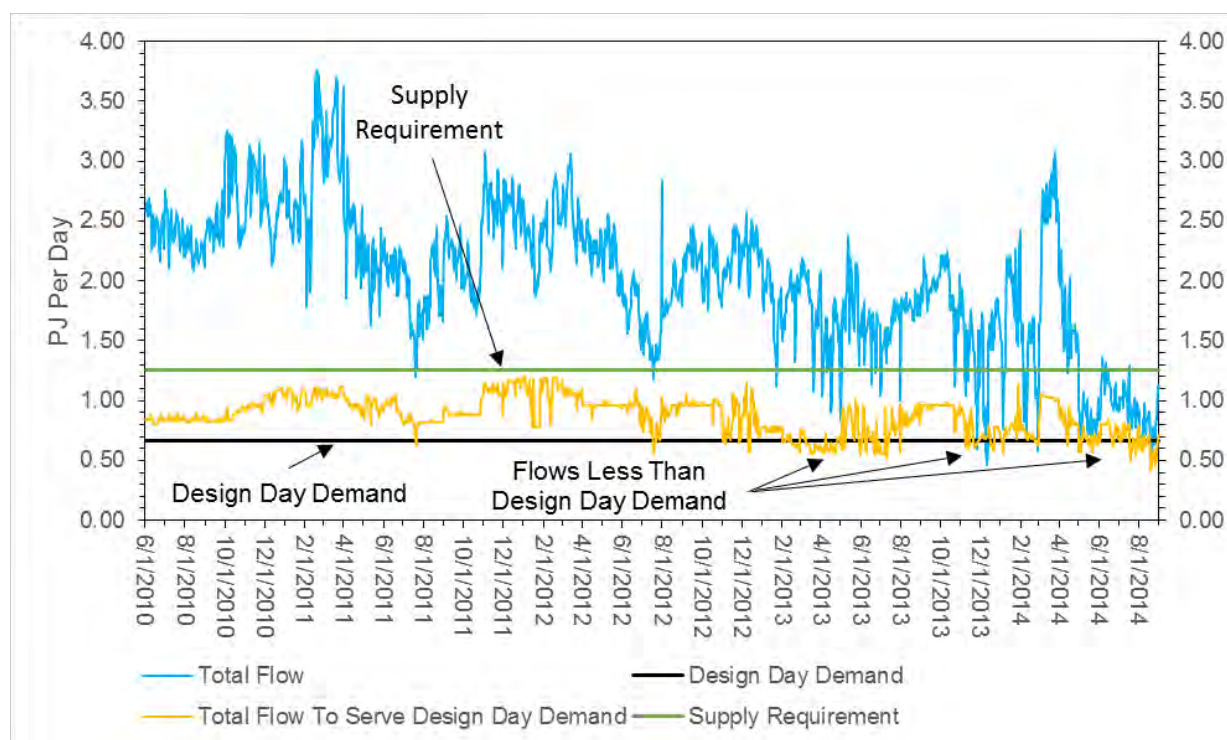
As illustrated in Figure 17, over the time period reviewed (i.e., 2010 through 2014) the winter flows on Bluewater were relatively consistent peaking at approximately 0.2 PJ per day; however these flows were still well below the Design Day Demand level and the Bluewater interconnect capacity of 0.3 PJ per day.⁸¹ During the summer period, the flows on Bluewater ranged from 25 to 50 TJ per day, or often zero, thus contributing limited, if any, supply to the Design Day Demand.

To better illustrate the fluctuations in aggregate volumes on the Upstream Pipelines, Sussex compared the combined daily flows on the Upstream Pipeline to the Design Day Demand and the Supply Requirement. Please see Figure 18.

⁸⁰ Source: Union Gas Limited.

⁸¹ The Bluewater interconnect capacity is 0.3 PJ/d based on Union and Bluewater facilities. Source: Union Gas Limited.

Figure 18: Combined Natural Gas Shipments on Upstream Pipelines⁸²



As shown in Figure 18, the total flow on the Upstream Pipelines generally exceeded the Supply Requirement and Design Day Demand. However, in 2013 and 2014, there were an increasing number of observations with total flows on the Upstream Pipelines less than the Supply Requirement and 16 observations when the total flows were less than the Design Day Demand. Once the interconnect capacities on the Upstream Pipelines are considered, the number of observations less than the Design Day Demand increases to 179 observations (i.e., the yellow line in Figure 18).⁸³

To understand the effect of the inverted basis differentials on the Upstream Pipelines, Sussex combined its flow and basis differential analyses. To do so, Sussex: (i) identified the days when the Upstream Pipelines experienced an inverted basis differential; and (ii) evaluated the natural gas shipments on those days, specifically:

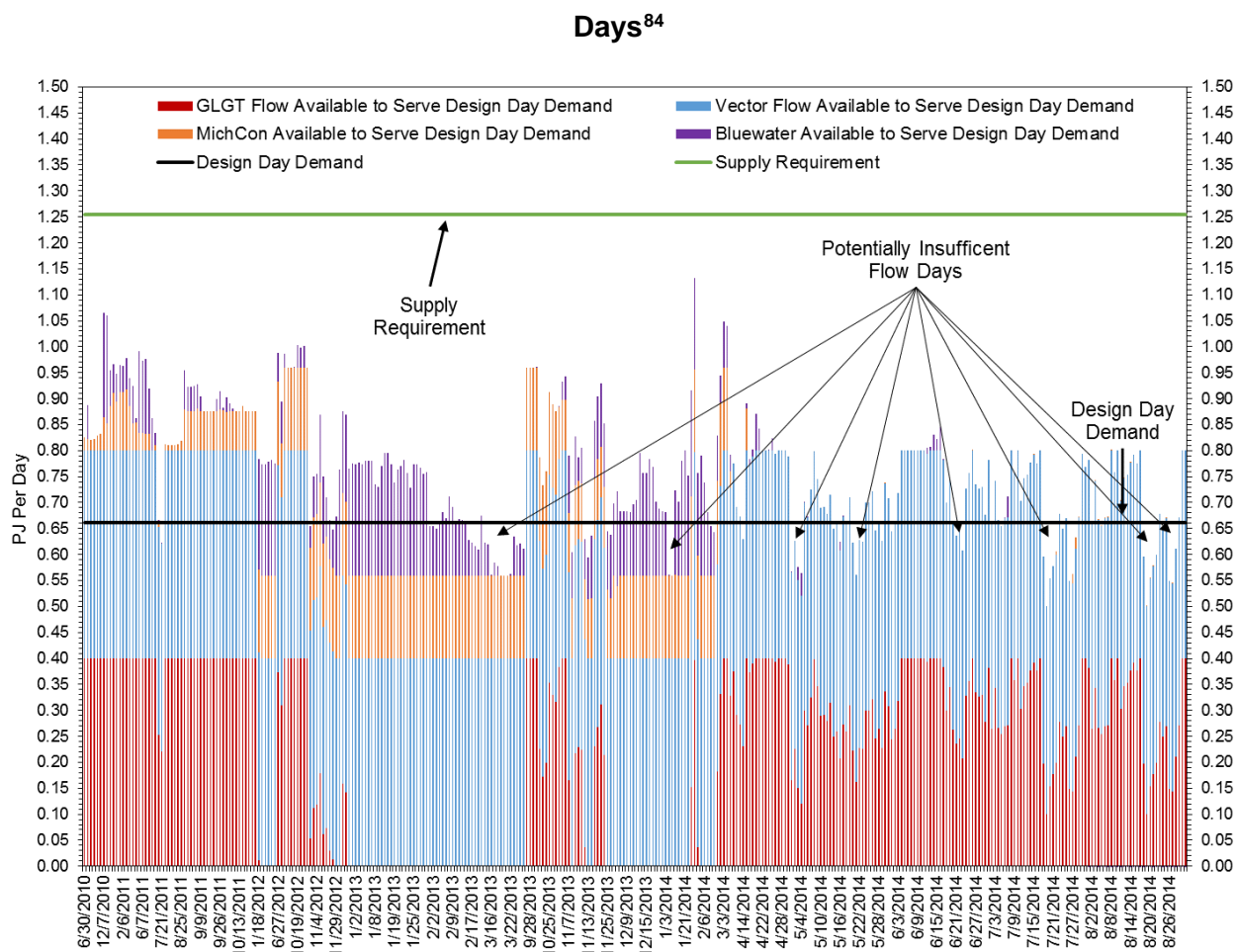
⁸² Source: Union Gas Electronic Bulletin Board History 2010 to 2014 (GDSR History from June 01 2010 to August 31 2014.xls).

⁸³ Please note that there are two differences between the Sussex and Union analysis with respect to flows: 1) the Sussex analysis is limited to June 2010 to August 2014, and 2) the Sussex analysis does not contain data for, nor draw conclusions, regarding the flows from Union's Facilities to Sarnia demand.

- There were 112 observations between June 2010 and August 2014 when the Emerson to Dawn basis differential inverted; the volume of natural gas transported by Great Lakes to Dawn on those days is substantially less than Great Lakes interconnect capacity of 0.4 PJ per day. Further, the volume on Great Lakes is often negative (i.e., receipts exceed deliveries) indicating the shipment of natural gas away from Dawn. All of the days in which the basis differential inverted were experienced during the winter months.
- A similar analysis was performed to evaluate the volume of natural gas transported on Vector on those days in which the basis differential between Dawn and Chicago inverted (i.e., incented transportation of natural gas away from Dawn to Chicago). Of the 103 days on which there was an inverted basis differential between Chicago and Dawn during the June 2010 and August 2014 time period, Vector saw a substantial decline in volumes transported to Dawn on at least 43 days, or 42 percent of the observations.
- Next, Sussex evaluated the volumes of natural gas transported on MichCon and Bluewater on days in which there was an inverted basis differential between Dawn and MichCon (Detroit City Gates). An inverted basis differential occurred on MichCon and Bluewater approximately 226 days and 34 days respectively between June 2010 and August 2014. On these days, the flows on MichCon and Bluewater often resulted in limited or no volumes of natural gas transported on MichCon and Bluewater to Ontario.

Finally, Sussex evaluated the volumes of natural gas transported on the Upstream Pipelines when any of the Upstream Pipelines experienced an inverted basis differential. Figure 19 presents the results of this analysis.

Figure 19: Combined Natural Gas Flows on the Upstream Pipelines on Inverted Basis



As illustrated in Figure 19, on 94 of the 342 days in which one of the Upstream Pipelines experienced an inverted basis differential, the aggregate flows on the Upstream Pipelines were below the Design Day Demand. In addition, the combined flows on the Upstream Pipelines were below the Supply Requirement on all 342 days. Further, of the 342 observations in which one of the Upstream Pipelines experienced an inverted basis differential, there were 88 days when two of the Upstream Pipelines experienced basis inversions, 21 days when three of the Upstream Pipelines experienced basis inversions and one day when all four Upstream Pipelines had a basis differential equal to or less than zero. Finally, the number of days on which Union had potentially insufficient volumes to meet the Design Day Demand has increased substantially during the spring and winter of 2014.

⁸⁴ Source: SNL Financial, LLC and Union Gas Limited.

Based on this analysis, Sussex concludes that the market dynamics, which supported flows on the Upstream Pipelines to Dawn, may be changing thus requiring Union to reevaluate how it serves the Design Day Demand.

Risk Assessment

In addition to the quantitative analyses (i.e., the basis differential analysis and the flow analysis), Sussex also qualitatively assessed certain risks. Specifically, Union currently relies on the flow of natural gas between Michigan and Ontario to provide adequate supply of natural gas to the Sarnia Industrial Line and, therefore, meet the Design Day Demand and the Supply Requirement. While this structure has worked in the past, the risk in meeting the Design Day Demand and Supply Requirement has increased. Foremost of these risks is the fact that Union is unable to assert direct control over the assets and the natural gas supplies that provide natural gas on the Upstream Pipelines. As a result, Union must rely on the transportation decisions of other shippers to bring natural gas to Dawn on the Upstream Pipelines. For both Great Lakes and Vector, the majority of shippers are marketers and producers that are likely seeking short-term arbitrage opportunities while fulfilling the requirements of their contractual obligations. Thus, Union's ability to serve the Design Day Demand and Supply Requirement is somewhat dependent on the alignment of market price signals to bring sufficient volumes of natural gas to Dawn.

Union also does not know when market conditions or events could cause the flow to Dawn on the Upstream Pipelines to decrease. Union, like other market participants, does not necessarily know whether adverse market conditions or events are short-term or long-term in duration. Stated differently, the basis differentials and the flows of natural gas on the Upstream Pipelines are subject to daily market conditions, which limit the ability of Union to predict and prepare for such events.

Finally, the long-term trends of reduced availability of WCSB natural gas to the eastern markets (e.g., Ontario), coupled with potential natural gas transmission projects that would transport Marcellus and Utica natural gas to the U.S. Mid-West and Ontario, would suggest that the daily fluctuations in the basis differentials and flows of natural gas are likely to continue.

IV. Observations and Conclusions

Based on the quantitative and qualitative analysis discussed herein, the market and supply research developed, and the experience and judgment of the Sussex project team, the following is a review of our principal observations and conclusions:

- To serve the Supply Requirement, Union relies on natural gas flows to Dawn on the Upstream Pipelines.
- The Upstream Pipelines currently access natural gas supply from the WCSB and other natural gas production basins that are facing increased competition from natural gas produced in the Marcellus and Utica shale basins.
- There is increased demand for WCSB gas in Alberta from the oil sands and electric power generation segments, which has resulted in less natural gas supply available for eastern markets (e.g., Ontario) and reduced flows on the Upstream Pipelines.
- The Sussex basis differential analysis identified certain days when the price spread between locations on the Upstream Pipelines and the Dawn Hub were equal to or less than zero (i.e., inverted basis differentials), thus providing an incentive to either not deliver natural gas to Dawn or transport natural gas to other markets (e.g. Michigan or Chicago).
- The number of days observed with inverted basis on the Upstream Pipelines has increased significantly, which, if that trend continues, could reduce the incentive to flow gas to the Dawn Hub.
- The Sussex flow analysis reviewed the flows on each of the Upstream Pipelines and compared that volume to the Design Day Demand and the Supply Requirement. In addition, Sussex analyzed the Upstream Pipeline flows in aggregate relative to the Design Day Demand and the Supply Requirement. Finally, Sussex reviewed the Upstream Pipeline flows on days with inverted basis differentials. The results of these analyses illustrate that flows on the Upstream Pipeline have declined and become less predictable, which may affect the ability of Union to meet the Design Day Demand and the Supply Requirement.
- The short-term nature of the contracting practices on the Upstream Pipelines, coupled with significant contract expirations over the coming years, decreases the predictability of flows to Dawn and increases risk regarding Union's existing approach to meeting Design Day Demand and the Supply Requirement.

- Finally, the inability of Union to predict or control the flow of natural gas to Dawn on the Upstream Pipelines exacerbates the risk of meeting the Design Day Demand and the Supply Requirement.

Based on these observations and conclusions, it is reasonable for Union to seek alternatives that increase the security of gas supply to meet the Design Day Demand and the Supply Requirement.

Appendix A - Sussex Team Bios

James M. Stephens, Partner

Mr. Stephens has twenty-five years of experience in the energy industry and he has held senior management positions at consulting firms, energy marketing companies and natural gas utilities. He has assisted numerous clients with regulatory policy strategy/tactics and energy market analyses/assessments including: the analysis of regional energy market dynamics and the associated drivers for new natural gas infrastructure (e.g., pipeline expansions); the evaluation of new markets/opportunities (e.g., distributed LNG); market entry/exit strategies (e.g., service territory or product/service expansions); market implications of new energy infrastructure (e.g., LNG facilities and pipelines); integrated resource plans (e.g., natural gas demand forecasting and resource portfolio analysis); natural gas supply portfolio evaluation and optimization (e.g., asset management agreements); and management prudence (e.g., implementation of risk management/portfolio strategies). In addition to his consulting experience, Mr. Stephens served as the President of a retail energy-marketing firm where he was responsible for all aspects of business unit management including front, mid and back office functions. Mr. Stephens was also responsible for the Gas Supply Procurement and Portfolio Optimization function for a local distribution company. Mr. Stephens holds a B.S. in Management and an M.B.A. with a concentration in Operations Management from Bentley College.

Samuel G. Eaton, Managing Consultant

Mr. Eaton has nearly 10 years of consulting experience in the electric and natural gas industries. His work includes assisting the sponsors of numerous projects in the U.S. and Canada. Separately, Mr. Eaton participated in excess of \$7 billion of nuclear- and fossil-fueled power plant divestitures, and corporate acquisitions. His experience on these transactions includes due diligence, workforce matters, the development and negotiation of purchase and sale agreements, and closing the transactions. Mr. Eaton has assisted electric and natural gas utilities with rate design, analyzed natural gas resource needs and market demand for local distribution and pipeline companies, as well as aided in the development of expert reports ranging in topics from round-trip trades to the economic impact of storing spent nuclear fuel. Prior to entering the consulting industry, he was employed by the Jacksonville Economic Development Commission where he developed and implemented a database of local companies eligible for economic development incentives and provided project support for

several local development projects. Mr. Eaton holds a B.A. in Economics from Brandeis University.

Peter Newman, Executive Advisor

Mr. Newman, who is an Executive Advisor with Sussex, has over thirty-five years of experience in various natural gas supply management roles for WE Energies. Specifically, Mr. Newman was responsible for managing all the natural gas supply functions including: long term supply planning and acquisition; natural gas purchasing strategies and execution; capacity portfolio optimization; development and implementation of risk management objectives and policies; and management of the gas control function. In addition, Mr. Newman participated in numerous Federal Energy Regulatory Commission proceedings with respect to natural gas pipeline expansions, rate proceedings, new services and other regulatory issues. Mr. Newman was also a key member of the management team that developed and built the Guardian Pipeline and, in that role, Mr. Newman contributed to a variety of activities, including market development and project management, developing and implementing the open season process, market assessment, regulatory strategy and proceedings, capacity marketing and tariff development. Mr. Newman is an engineering graduate of the University of Wisconsin-Platteville.

Appendix B - Proposed Western Canadian and Oregon LNG Export Facilities

Location	Asset Name	Ownership	Capacity (MMTPA)	NEB Export Application Status and Length	NEB Maximum Annual Export Allowance (MMTPA)	Expected Start Date
Kitimat, B.C.	Douglas Channel Energy Project	Haisla Nation/LNG Partners (50%), Golar LNG (25%), unnamed Asian investor (25%)	1.8	Approved; 20 years	1.98	2015
Kitimat, B.C.	Kitimat LNG Terminal	Apache Canada Ltd. (50%), Chevron Corp. (50%)	5	Approved; 20 years	11	2017
Kitsault, B.C.	Kitsault	Kitsault Energy and a Memorandum of Understanding signed "with an Asian oil and gas major"	5	Under review; 25 years	2.53	2017
Woodfibre, B.C.	Woodfibre LNG	Woodfibre (Pacific Oil & Gas Group)	2.1	Approved; 25 years	2.645	2017
Kitimat or Prince Rupert, B.C.	Triton LNG	AltaGas Ltd. (50%), Idemitsu Kosan Co. (50%)	2.3	Approved; 25 years	24.13	2017
Lelu Island, Port Edward, B.C.	Pacific Northwest LNG	Petronas (62%), SINOPEC (15%), Indian Oil Corp. (10%), Japex (10%), Petroleum Brunei (3%)	12	Approved; 25 years	13.63	2018
Coos Bay, Ore.	Jordan Cove LNG	Versen Inc.	6	Approved; 25 years	11.2	2018
Astoria, Ore.	Oregon LNG	Oregon LNG	9.74	Approved; 25 years	27.6	2019
Campbell River, B.C.	Discovery LNG	Quicksilver Resources Canada, and a "to-be-determined third party"		None	35.23	2019
Kitimat, B.C.	LNG Canada Terminal	Shell Canada Ltd. (40%), Mitsubishi Corp. (20%), Korea Gas Corp. (20%), PetroChina (20%)	12	Approved; 25 years	25.6	2020
Kitimat or Prince Rupert, B.C.	WCC LNG	Imperial Oil Ltd. (50%), ExxonMobil Canada (50%)	10-15	Approved; 25 years	27.6	2021-2022
Ridley Island, Prince Rupert, B.C.	Prince Rupert LNG	BG Group	14	Approved; 25 years	3.5	2021
Grassy Point, B.C. (13)	Aurora LNG	Nexen (60%), Inpex Corp. and JGC Corp. (40%)	24	Approved; 25 years		2021-2023
Stewart, B.C.	Stewart Energy LNG	Canada Stewart Energy Group Ltd.	5 to 30	Under review; 25 years		2017
Grassy Point, B.C.	TBA	Woodside Petroleum		None		
Vancouver, B.C.	Tilbury LNG	WesPac Midstream LLC	3	Under review; 25 years		2016

Notes: Maximum annual export allowance includes annual tolerance. Dates: Announced date of first export/initial opening. Capacity: Capacity at initial opening, not full potential capacity.

Source: *Risky Business: The Issue of Timing, Entry and Performance in the Asia-Pacific LNG Market*, The School of Public Policy at the University of Calgary, SPP Research Papers Vol. 7, Issue 18 July 2014.

EB-2014-0333
Schedule 5-1
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City of Sarnia

St. Clair River

Vidal Station

McPlank Station

Churchill Station

Sarnia Industrial Station

NPS 10 Dow Line

NPS 12

NPS 10 Dow Storage Line

Dow A Pool

NPS 20 Bluewater Line

Dow Valve Site

NPS 16

NPS 20

NPS 12

Novacor Corunna Station

NPS 10

Payne Pool Compression Station

Payne Kimball Station

NPS 8 Kimball Line

NPS 20 Sarnia Industrial Loop Line

NPS 10 Payne Kimball Line

NPS 12 Sarnia Industrial Line

NPS 20 Payne Storage Line Line

NPS 8 Dawn - Kimball Line

Michcon

NPS 24 St Clair NEB

Courtright Station

St Clair Line Station

NPS 24 St Clair Line

Bickford Pool

Bickford Compressor Station

NPS 24 Bickford Storage Line

NPS 42 Vector Line

NPS 36/42 TCPL GLGT Line

Sombra Pool

Terminus Pool

Dawn - Parkway

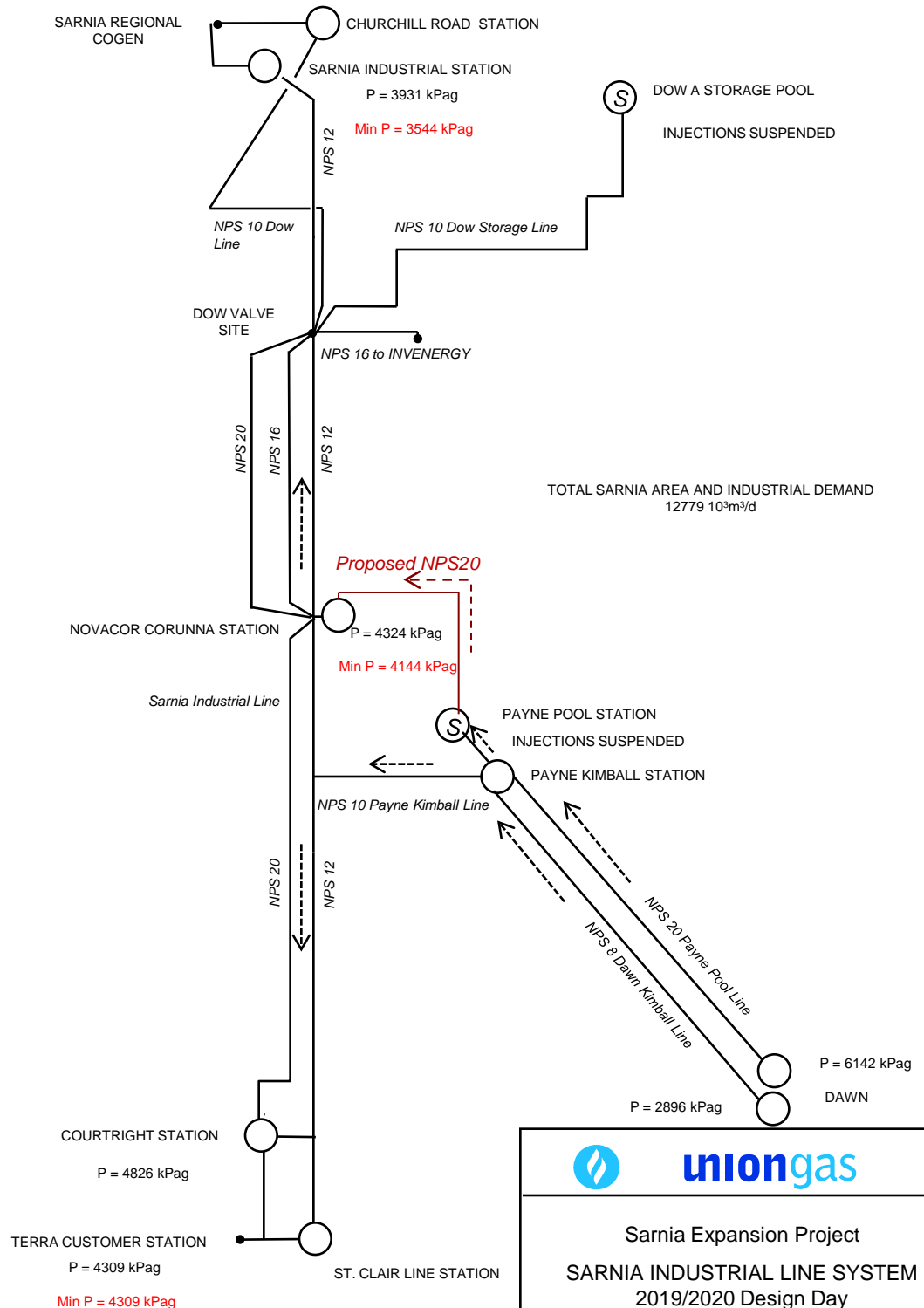
Dawn

uniongas

Sarnia Expansion Project

SARNIA INDUSTRIAL LIINE SYSTEM
SCHEMATIC OF EXISTING FACILITIES

SARNIA INDUSTRIAL LIINE SYSTEM SCHEMATIC OF EXISTING FACILITIES

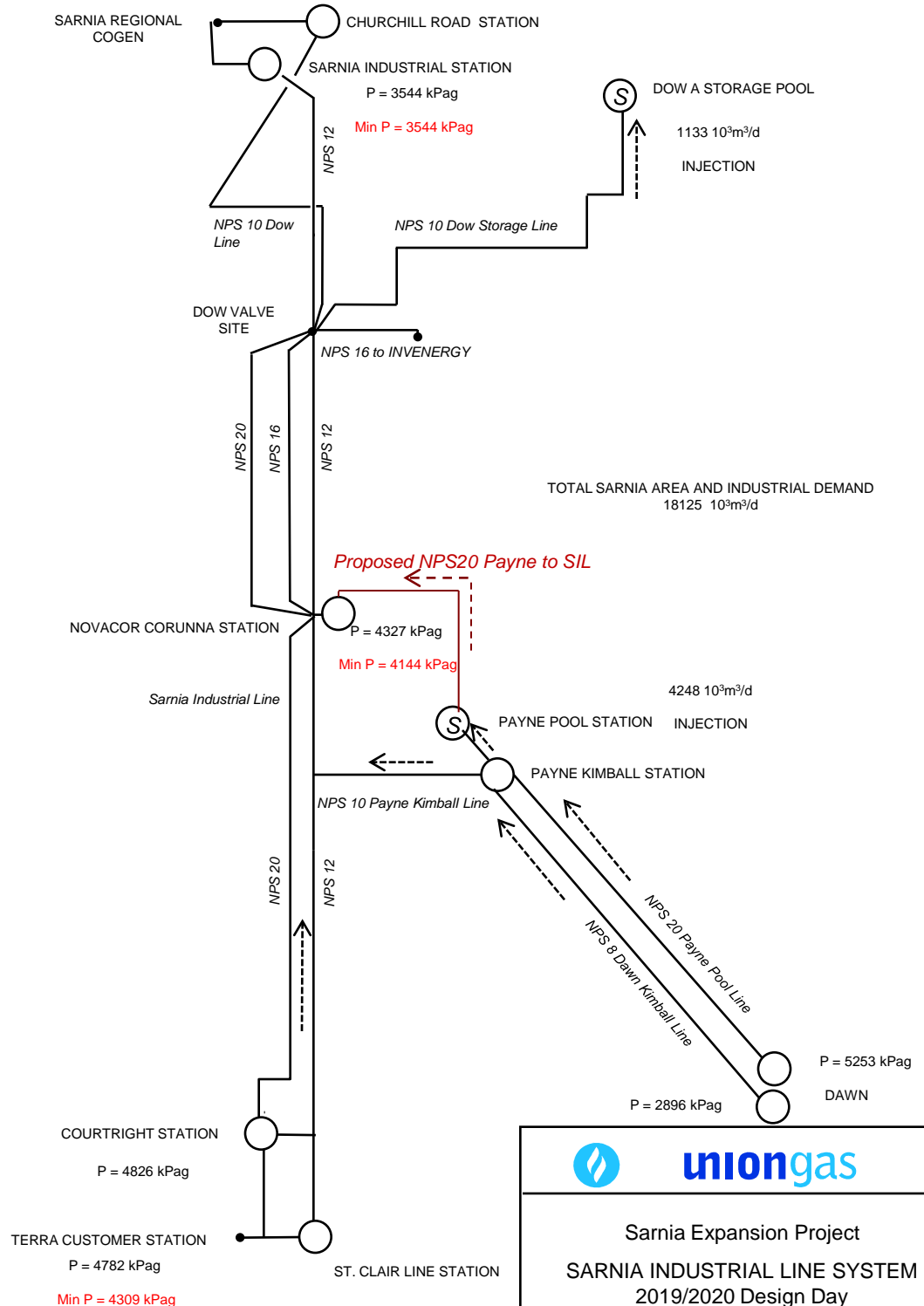


Note: Drawing is not to scale.



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Sarnia Expansion Project
SARNIA INDUSTRIAL LINE SYSTEM
2019/2020 Design Day
Vector Supply Outage – Interruptible
Customers Curtailed

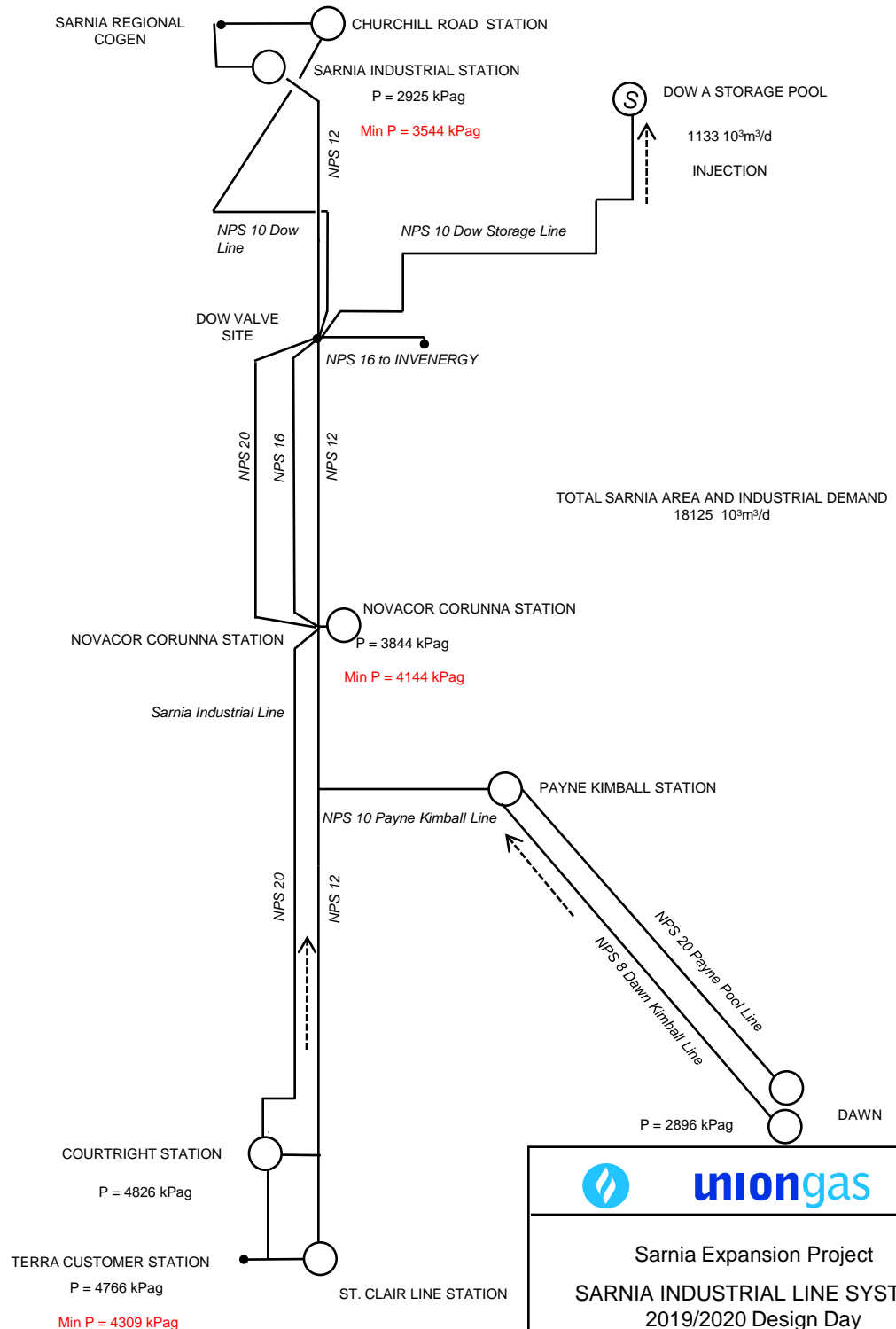


Note: Drawing is not to scale.



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Sarnia Expansion Project
SARNIA INDUSTRIAL LINE SYSTEM
2019/2020 Design Day
With Sarnia Expansion Project



Note: Drawing is not to scale.

TOTAL ESTIMATED PIPELINE CAPITAL COSTS

SARNIA EXPANSION PIPELINE PROJECT

2015 Construction

Pipeline and Equipment

4.8 kms of NPS 20 \$ 1,300,000

Valves, Fittings and Miscellaneous Material \$ 1,031,000

Total Pipeline and Equipment \$ 2,331,000

Construction and Labour

Lay 4,800 metres of NPS 20 Steel Pipe \$ 8,669,000

Miscellaneous Contract Labour

Company Labour, Inspection, X-Ray, Construction Survey,
Legal, Environmental, Archeology, and Permitting \$ 3,594,000

Easements, Lands, Damages & Regulatory \$ 1,150,000

Total Construction and Labour \$ 13,413,000

Subtotal Estimated Pipeline Capital Costs \$ 15,744,000

Contingencies \$ 2,362,000

Interest During Construction \$ 261,000

Total Estimated Pipeline Capital Costs \$ 18,367,000

TOTAL ESTIMATED STATION CAPITAL COSTS

SARNIA EXPANSION PIPELINE PROJECT

2015 Construction

Station Equipment and Labour

Station Equipment	\$	2,155,000
Construction and Labour	\$	2,348,000
Company Labour, Inspection, X-Ray, Construction Survey, Legal, Environmental, Archeology, and Permitting	\$	490,000
Easements, Lands, Damages & Regulatory	\$	105,000
<hr/>		
Subtotal Station Equipment, Construction, and Labour	\$	5,098,000
<hr/>		
Contingencies	\$	765,000
Interest During Construction	\$	88,000
Total Estimated Station Capital Costs	\$	5,951,000
<hr/> <hr/>		

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SARNIA EXPANSION PIPELINE PROJECT (Project Specific DCF Analysis) Stage 1 DCF - Listing of Key Input Parameters, Values and Assumptions (\$000's)	
Discounting Assumptions Project Time Horizon Discount Rate	commencing at facilities in-service date of November 1, 2015 10 years from March 1, 2015 contract commencement date (coensides with earliest customer attachment) Incremental after-tax weighted average cost of capital of 5.28%
Key DCF Input Parameters, Values and Assumptions <i>Net Cash Inflow:</i> Incremental Transportation Revenue: Rate T2 Firm Transportation Contract Demand Operating and Maintenance Expense Incremental Tax Expenses: Municipal Tax Income Tax Rate CCA Rates: CCA Classes: Eligible Capital Expenditure (ECE) Class 49 (Transmission Mains)	Approved per EB-2013-0365 Effective January 1, 2014 1,272,000 m ³ Estimated incremental cost Estimated incremental cost 2014 = 26.5% underpinning approved rates Declining balance depreciation rates by CCA class: 7% 8%
<i>Cash Outflow:</i> Incremental Capital Costs Attributed Change in Working Capital	Refer to Schedules 6-1 and 6-2 7.1649% applied to O&M

PROJECT SCHEDULE

[illegible]

Construction Schedule

2015 Pipeline Construction

SARNIA EXPANSION

DESIGN AND PIPE SPECIFICATIONS

Design Specifications: NPS 20

Class Location (existing)	-	Class 1
Design Class Location	-	Class 3
Design Factor	-	0.8
Location Factor (General)	-	0.625
Location Factor (Roads/Railways)	-	0.625
Maximum Design Pressure	-	6895 kPa
Maximum Operating Pressure	-	6895 kPa
Test Medium	-	Water
Test Pressure	-	9653 kPa
Valves/Fittings	-	PN 100
Minimum Depth of Cover	-	1.0 m

Pipe Specifications:

Size	-	NPS 20
Outside Diameter	-	508 mm
Wall Thickness	-	7.6 mm
Grade	-	483 MPa
Type	-	Electric Resistance Weld
Description	-	C.S.A. Standard Z245.1-07
Category	-	Cat. II, M5C
Coating	-	Fusion Bond Epoxy
% SMYS	-	48%

GENERAL TECHNIQUES AND METHODS OF CONSTRUCTION

1. Pipeline construction is divided into several crews that create a mobile assembly line. Each crew performs a different function, with a finished product left behind when the last crew has completed its work.
2. Union Gas will provide its own inspection staff to ensure the contractor meets its contractual obligations.
3. Where possible, trees are cleared in the winter before construction to avoid avian nesting concerns. If the land cannot be accessed in the winter due to incomplete easement negotiations or other reason, an ornithologist will inspect the site and direct any avian mitigation needed. Logs are stacked at the side of the easement for landowner use, if requested.
4. The contractor's clearing crew braces and cuts all fences crossing the easement and installs any required temporary gates. This crew clears small brush and crops on the easement and temporary working areas.
5. The grading crew constructs approaches through road, highway, and railway ditches to allow equipment onto the working side of the easement. This crew also builds roads through wet areas to allow heavy equipment operation. The grading crew strips a certain width of topsoil with bulldozers and graders so that it will not be mixed with the subsoil later removed from the trench. In hilly terrain, the grade is levelled to provide a stable working surface.
6. The contractor erects safety barricades around excavations adjacent to roads. Flagmen and signs are used for traffic control. The easement is fenced nightly at all access points.
7. The stringing crew then lays pipe on wooden skids on the working side of the easement adjacent to the proposed trench area. Wherever possible, the stringing trucks hauling the pipe travel down the centre of the proposed trench to minimize soil compaction effects.

8. The contractor, by use of a trenching machine or hoe excavator, will excavate a trench approximately 1.1 metre in width for the pipeline, depending on ground conditions at the time. Accesses across the easement including laneways are left unexcavated where requested by the landowner. All tile cut during trench excavation is flagged at the trench and easement limits to signify to the tile repair crew that a repair is required. All utilities that will be crossed or paralleled closely by the pipeline will be located prior to trenching.
9. Bedrock will be removed by mechanical means such as excavators using a rock bucket or a “hoe ram”.
10. Concurrent to trenching, the contractor will have separate crews to install the pipe at road and railway crossings. This operation will be accomplished by trenchless technology techniques such as Jack and Bore (auger) or Horizontal Directional Drill (HDD). These trenchless technology techniques do not disrupt the surface features at the crossing site. These installations involve an excavation on both sides of the proposed crossing to allow room for the equipment to be operated and the pipe to be installed at the proper elevation.
11. Next, the pipe between roads, accesses, laneways, and streams is welded into one continuous length. All welds are ultrasonically and/or radiographically inspected and then coated and lowered into the trench. After sections of pipe are lowered into the trench, subsoil is backfilled by a drag line, bulldozer or backhoe. If the excavated material contains too much rock for direct backfilling, it may be sifted to separate the fine parts from the rock. If such separation is not possible due to the consistency of the material or if a large quantity of rock remains, the unsuitable materials will be hauled away and sand brought in for backfilling.
12. The tie-in crew is responsible for the installation of pipe across accesses and laneways to minimize the length of time that these accesses are out of service to the landowner. The tie-in crew is also responsible for the pipeline installation at most river and stream crossings.
13. The pipe is filled with water and hydrostatically tested to prove its integrity. After the test water is removed and the line dried, an electronic sizing tool is run through the pipeline to check for ovality and dents. Cathodic protection is applied to the completed pipeline.

14. After the trench is backfilled, any cut cross-easement tile is repaired. Union undertakes that it is responsible for the tile repair resulting from construction and will stand good for the tile repairs at any further date after construction of the pipeline. Union retains the services of a tile consultant to determine if it is better to repair individual tiles crossing the easement or install a header system.
15. The clean-up crew is the last crew on the property. On farmland, it prepares the subsoil on the stripped portion of the easement by subsoiling or deep chisel ploughing to break up compaction and picking all stones down to 100 millimetres in diameter. The trench line is crowned with enough subsoil to allow for trench settlement. Excess subsoil is removed to an acceptable location on the landowner's property or hauled to a disposal site. Topsoil is then replaced using a drag line or backhoe and small bulldozers to minimize compaction. The working side of the easement is then chisel ploughed and stone picked. The clean-up crew will also repair fences, pick up debris, replace sod in landscaped areas and reseed sensitive areas such as woodlots, ditch banks and stream crossings.
16. When the clean-up is completed, the landowner is asked by a Company representative to sign a clean-up acknowledgement form if satisfied with the clean-up. This form, when signed, allows release of payment for the clean-up to the contractor. This form in no way releases the Company from its obligation for tile repairs, compensation for damages and/or further clean-up as required due to erosion or subsidence directly related to pipeline construction.

**Payne-Sarnia Pipeline Project
Environmental Report**



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May 13, 2014

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Acronyms & Abbreviations

ANSI	Area of Natural Scientific Interest
CLI	Canada Land Inventory - Suitability for Agriculture
ER	Environmental Report
GIS	Geographic Information System
ha	Hectare
mm	Millimetre
MNR	Ministry of Natural Resources
MNO	Métis Nation of Ontario
MOE	Ministry of the Environment
MTCS	Ministry of Tourism, Culture and Sport
NHIC	Natural Heritage Information Centre
OEB	Ontario Energy Board
OPCC	Ontario Pipeline Coordinating Committee
PSW	Provincially Significant Wetland
RoW	Right-of-Way
SCN	Soybean Cyst Nematode
SCRCA	St. Clair Region Conservation Authority
Stantec	Stantec Consulting Ltd.
TSSA	Technical Safety and Standards Association
Union Gas	Union Gas Limited

1.0 Introduction

1.1 PROJECT DESCRIPTION

Union Gas Limited (Union Gas) is proposing to construct a new 20 inch (508 millimetres (mm)) diameter steel pipeline approximately 5 kilometres (km) in length. The proposed pipeline would commence at Union Gas's existing Payne Storage Pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia Industrial pipeline system south of Rokeby Line between Highway 40 and Baby Creek. Union Gas hired Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the natural gas pipeline. The construction and operation of the proposed pipeline is hereafter referred to as the 'project'. The Proposed construction would occur in 2015.

1.2 REGULATORY REQUIREMENTS AND APPROVAL PROCESS

The environmental study has been completed in accordance with the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario, 6th Edition (OEB Environmental Guidelines) (2011)*, as well as relevant federal and provincial environmental guidelines and regulations. The environmental study results have been documented in this Environmental Report (ER).

Once complete, the ER is circulated to affected municipalities, conservation authorities, First Nations, Metis Nation of Ontario and to the Ontario Pipeline Coordinating Committee (OPCC) for their review and comment. The OPCC is an inter-ministerial committee that includes provincial government ministries, boards and authorities with potential interest in the construction and/or operation of hydrocarbon transmission and storage facilities. If requested the ER is also circulated to landowners and any other interested parties.

The ER will accompany any future Union Gas application to the OEB for a 'Leave-to-Construct' for the proposed project. Upon application the OEB may then hold a public hearing which will include notices in local newspapers, letters to directly affected landowners, the opportunity for the general public and landowners to submit questions regarding the project, a formal hearing and a written decision. If after this review the OEB finds the project is in the public interest, it will approve construction of the project. If the project is approved the OEB normally attaches conditions to the approval which Union Gas will comply with during the construction and restoration process.

1.3 ENVIRONMENTAL STUDY

1.3.1 Study Process

The environmental study process was initiated in 2013 by a multidisciplinary team of environmental planners and scientists. Union Gas provided environmental support and engineering expertise throughout the study, as required.

The various steps outlined in the process are divided into three main phases as presented below. A map of the study area is provided in **Appendix A** and route figures are provided in **Appendix B**.

Phase I: Inventory and Mapping of Existing Conditions; Identification of Route Options

The environmental study commenced with delineation of the study area (see **Section 2.2**). Environmental features and conditions in the study area were mapped and characterized using relevant published literature, maps and digital data. Geographically based environmental features were incorporated onto a series of digital base maps (see **Appendix A**). Discussions with relevant agencies and municipalities provided information essential for compiling the existing conditions inventory and mapping.

Generation of route options was based on the routing objectives, study area, and environmental and socio-economic constraints and opportunities identified in **Section 3.2**. Route generation was assisted through multiple site visits by staff of Stantec and Union Gas, aerial photography interpretation, knowledge of the area and mapping of existing environmental and socio-economic constraints and opportunities.

Phase II: Identification of a Preliminary Preferred Route

The identification of the preliminary preferred route was undertaken through a comparative evaluation of the route options as outlined in **Section 3.4**. Subsequently, notification of the project and details of the Information Session were sent to relevant federal and provincial agencies and authorities, municipal staff, special interest groups, First Nation communities and the Métis Nation of Ontario (MNO).

An Information Session (as part of the Consultation Program) was held to provide interested and potentially affected parties with an opportunity to comment on the project, the route evaluation process and the preliminary preferred route (see **Section 4**).

Phase III: Confirmation of Preferred Route; Environmental Report

Based on feedback received during the Information Session and from returned exit questionnaires, there are ongoing communications involving the Township, industrial landowners, private landowners and tenant farmers along the route (see **Section 4.2**). The issues brought forward to date will be addressed during the detailed design stage and more will be addressed

to ensure minimal environmental effects. Since no issues have been raised which required a reassessment of the preliminary preferred route, the preferred route was confirmed and finalized. Phase III concluded with the preparation of this ER.

1.3.2 Objectives

The principal objectives of the environmental study were to select an environmentally acceptable preferred route for the pipeline and to discuss appropriate environmental mitigation and protection during construction and operation of the project, while meeting the intent of the OEB *Environmental Guidelines* (2011). To meet these objectives, the environmental study has been prepared to:

- define a study area and compile an inventory of physical, aquatic, terrestrial and socio-economic features and conditions in this area
- identify and evaluate alternative routes in light of their individual and comparative characteristics
- identify a preferred route that minimizes effects and is acceptable to Union Gas from a constructability and cost perspective
- complete a detailed review of environmental features along the preferred route and assess the potential environmental effects of the project on these features
- establish mitigation and protective measures that may be utilized to obviate or minimize potential environmental effects of the project
- develop a consultation program to contact, record and reflect the concerns and comments of interested parties
- identify monitoring and contingency plans

1.3.3 Organization

The environmental study has relied on technically sound and consistently applied procedures that are replicable and transparent. The ER will form the foundation for future environmental management activities related to the project. The ER is organized into the following sections:

- 1.0 **Introduction:** provides a description of the project, the approval process, and the environmental study
- 2.0 **Environmental Features in the study area:** provides a summary of the inventory of existing environmental conditions (physical, aquatic, terrestrial and socio-economic) in the study area
- 3.0 **Route Selection:** provides an overview of the pipeline route selection process

- 4.0 **Consultation Program:** describes the consultation program
- 5.0 **Effects Assessment:** identifies potential effects of construction and operation of the proposed project and recommends appropriate mitigation and protective measures
- 6.0 **Cumulative Effects:** provides an analysis of potential cumulative effects associated with the proposed project
- 7.0 **Supplemental Studies:** summarizes the recommended studies to confirm the effects assessment and provide site specific mitigation and protective measures
- 8.0 **Monitoring and Contingency Plans:** describes monitoring and contingency plans to address potential effects of the proposed project
- 9.0 **Conclusion:** provides a conclusion related to the environmental effects associated with the proposed project
- 10.0 **Bibliography**

The ER also includes appendices for referenced documentation.

2.0 Environmental Features in the Study Area

2.1 HISTORY AND DESCRIPTION OF THE AREA

Aboriginal peoples have lived in southern Ontario for thousands of years. One of the Aboriginal cultural groups common to Ontario is the Chippewas. The Chippewas closest to the study area, near Sarnia, Ontario are the Aamjiwnaang First Nation. Further south of Sarnia, in the St. Clair River, Walpole Island is inhabited by the Ojibwe, Potawatomi, and Odawa peoples of Walpole Island First Nation, who call it Bkejwanong, meaning "where the waters divide".

Europeans settled in Corunna, the closest town to the study area, in the early 1820's and an agricultural community became established. East of Corunna are the towns of Petrolia and Oil Springs, Ontario. Oil Springs is where the world's oil industry started when the first commercial oil well was established in 1858. Ontario's first commercial natural gas well was drilled in Essex County near Leamington, Ontario in 1889 and natural gas was realized in Lambton County soon after. During World War II, the Sarnia area became a large processing centre for oil from Alberta. This petrochemical industry continues in the area. Lambton also possesses a large share of the Province's underground storage capacity for natural gas and other hydrocarbons in the underlying pools.

Today, with more than 125,000 residents, the County of Lambton continues to be dominated by rural land uses. There are also local communities and a significant petrochemical industry presence along with other industrial sectors. In the rural country side, natural areas include watercourses and woodlots.

The woodlots in the area are small remnants of the northern limit of Canada's Deciduous forest and are scattered across the relatively flat landscape typical for this area of south western Ontario. The larger woodlots comprise several of the natural areas. The Lambton County Official Plan (OP) (Lambton County, 1998) identifies ten Significant Natural Areas in the former Township of Moore:

1. Bear Creek Woodlot #3
2. Bickford Woods
3. Burton Drain Woodlot
4. Clay Creek Woodland
5. Crown Game Reserve
6. Plum Creek #1
7. Plum Creek Woods Heronry
8. Stag Island
9. Vulture Woods
10. Waubuno Woodlot.

The closest Significant Natural Area to the study area is the Bickford Oak Woods Wetland Complex. The next closest Significant Natural Area to the study area is the Burton Drain Woodlot.

The properties in the study area are identified in the St Clair Township Official Plan (SCOP) as Industrial Type 3 land. On the west side of the study area there are two industrial plants, the Suncor, St. Clair Ethanol Plant and the Nova Chemicals Moore Site. As well, there are numerous other industrial facilities in the greater area.

2.2 THE STUDY AREA

The boundaries of the study area were established by considering the location of the proposed end point, along Union's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek, and the location of the start point at Union existing Payne Storage Pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario.

The start and end points for the proposed pipeline are within the study area. It is located approximately 3.5 km east of the Town of Mooretown, Ontario. The study area for the EA of the proposed pipeline project is located in the area inside of the north side of Rokeby Line and the south side of Moore Line, the east side of Ladysmith Road and the west side of the Canadian National Railway tracks in St. Clair Township, Lambton County.

The study area is located within the Lake Erie Counties Climatic Region. Lands within the study area are predominantly utilized for agriculture. Non-agricultural land uses include fuel and chemical production.

Many of the farms in the area have woodlots at the back, along the middle of the concession blocks. The Lambton County Official Plan OP (LCOP) states that the Significant Woodlots are those located in a Primary Corridor or Significant Natural Area designations, or any contiguous forested area that is 4 hectares, or greater in size. In the OP, the woodlots in the study area are not along Primary Corridors or Significant Natural Areas. They are divided by clearings along lot lines and existing corridors. The OP identifies Natural Heritage Systems.

The St. Clair Region Conservation Authority (SCRCA) has identified the drains and rivers in the area as Regulated lands under the 'Development, Interference with Wetlands and Alterations to Shorelines and Watercourses' Regulation passed pursuant to Section 28 of the Conservation Authorities Act, R.S.O. 1990, Ch. 27. That Regulation prohibits the placement or dumping of fill, construction of a building or structure in the floodplain or alteration to a watercourse without prior written approval of that Authority. This is discussed further in **Section 5.3**

The Ministry of Natural Resources (MNR) Natural Heritage Information Centre (NHIC) database search identified a number a species that could potentially be found living in or crossing through the study area. This is discussed further in **Section 5.4**.

An Archaeological Assessment will be conducted along the preferred route when conditions allow. It is discussed in **Section 5.5.6**.

2.3 DATA SOURCES AND MAPPING

Selection of a preferred route and the determination of mitigation and protective recommendations is a reflection of concerns expressed through the consultation program, published information available from literature, maps and digital data, mitigation guidance documents, field assessments, and the previous pipeline development experience of Union Gas and Stantec. By necessity, the analysis, integration, and synthesis of the data is an iterative process since information becomes available at various stages of the study and at different mapping scales. The level of detail of data and mapping increases as the study moves from analysis of the study area, to analysis of preliminary routes, and finally, to a site specific survey of features along the preferred route.

The environmental and socio-economic information presented in the ER is based on sources cited throughout the ER. Where agencies requested that information be kept confidential (e.g. the precise location of archaeological sites), such information has been withheld from the report or mapped in such a way that specific site locations are not identified.

The key features in the study area relevant to route selection, including physical, aquatic, terrestrial and socio-economic features, are summarized below. The location of geographically available environmental and socio-economic features in the study area is illustrated in **Appendix A**.

2.4 PHYSICAL ENVIRONMENT

2.4.1 PHYSIOGRAPHIC CHARACTERISTICS AND RESOURCES

2.4.1.1 Bedrock Geology

The Paleozoic geography of the study area indicates that the bedrock underlying the study area is from the Kettle Point Formation (Hewitt, 1972). It is black fissile, bituminous shale generally found between 40-50 m below grade and surface outcrops are uncommon in the area. No outcrops have been identified in the study area.

2.4.1.2 Physiography, Topography and Surficial Geology

The study area is located in the St. Clair Clay Plains physiographic region of Southern Ontario (Chapman and Putnam, 1984). This clay plain has developed under historical glacial lakes and contains some sandy till but is mainly the finer textured silt and clay (Barnett et al., 1991). Topography around the study area is level to nearly level. Subsequently, slope stabilization and erosion are not anticipated. Surface deposits in the area are generally deeper than 35 meters. Surficial geological deposits within the study area have been mapped as glaciolacustrine deep-water silt and clay till deposits.

2.4.1.3 Soil Capability for Agriculture

The rural lands around the study area are predominantly used for agriculture. The soils that have developed on the glaciolacustrine deposits are the poorly drained Brookston clay and imperfectly drained Caistor clay. The Brookston clay covers most of the study area and is rated as Class 3 in the Canada Land Inventory (CLI). Class 3 soils have moderately severe limitations that restrict the range of crops or require special conservation practices. The Caistor clay soils cover the rest of the study area. They are rated as Class 2 in the CLI. Class 2 soils have moderate limitations that restrict the range of crops or require moderate conservation practices. The locations of the soils are shown on the Soil Capabilities and Drainage Types Map, **Appendix A, Figure 3**.

2.4.1.4 Extractive Resources: Aggregates and Minerals

Aggregates and Minerals

The Lambton County Official Plan displays that there are no significant mineral aggregate resources identified within the study area or Township of St. Clair as a whole. Construction and operation of the proposed pipelines will not sterilize any mineral resources or aggregate deposits.

Aggregate resources, which may be required during construction of the proposed pipelines, are available from sand and gravel operators that supply aggregate throughout Lambton County.

2.4.2 NATURAL HAZARDS

Natural hazards are elements of the physical environment which have the potential to affect a project in an adverse manner. Potential natural hazards in the study area are limited. A natural hazard discussed as having the potential to be in the study area is seismic activity.

2.4.2.1 Seismic Activity

Although earthquakes occur in all regions of Canada, certain areas have a higher probability of experiencing the damaging ground motions caused by earthquakes (known as seismic hazard). In Canada, the evaluation of regional seismic hazard for the purposes of the National Building Code is the responsibility of the Geological Survey of Canada. The probability of seismic hazard across the study area is rated as moderately low, which is typical of the majority of Southern Ontario (Natural Resources Canada, 2005).

2.5 AQUATIC ENVIRONMENT

2.5.1 GROUNDWATER

By looking at water well logs in the area, it was determined that the water table is generally located at depths of approximately 10 m below ground.

2.5.2 SURFICIAL HYDROLOGY

2.5.2.1 Municipal Drains, Watercourse and Watershed

The study area is located within two watersheds. The majority of the study area and all the municipal drains in the study area are located in the Baby Creek watershed. Surface water flow in the study area consists of several smaller drain flows in a southerly direction into a larger drain located along the south boundary of the study area. This larger drain flows to the west, draining into Baby Creek and eventually into the St. Clair River, approximately 1.5km downstream of the confluence with Baby Creek. Baby Creek is classified as warmwater habitat that supports a variety of species including top predators. Fish species previously identified in Baby Creek include:

- Yellow Bulhead
- Bluntnose Minnow
- White Sucker
- Fathead Minnow
- Green Sunfish
- Creek Chub
- Largemouth Bass
- Black Bullhead
- Common Shiner
- Johnny Darter

A small section of the study area, the northeast corner, is located in the Lower Bear Creek watershed. No watercourse or drain area is located in the portion of the study area; however, any overland flow occurring in the section would flow to the east into Lower Bear Creek.

The St. Clair Region Conservation Authority regulates the water courses in this area.

2.5.3 AQUATIC SPECIES AT RISK

According to the Ministry of Natural Resources (MNR's) Natural Heritage Information Centre (NHIC)(2013b) and Fisheries and Oceans Canada Aquatic Species-at-Risk mapping (DFO, 2013a), there are no aquatic species at risk or habitats identified in the study area.

2.6 TERRESTRIAL ENVIRONMENT

This section discusses constraints from construction that are present in the study area. Information sources are published information. Potential natural heritage features and habitats present include:

- Significant Woodlands
- Waterfowl Stopover and Staging – Terrestrial (Tundra Swan)
- Rare Forest Types

- Rare Vegetation and ELC Communities
- Amphibian Woodland Breeding Habitat
- Amphibian Wetland Breeding Habitat
- Habitat for rare species of wildlife:
 - Bobolink
 - Eastern Meadowlark
 - Butler's Gartersnake
- Habitat for rare species of plants:
 - Butternut
 - Carolina Whitlow-Grass
 - Davis' Sedge
 - Dense Blazing Star
 - Eastern Flowering Dogwood
 - Missouri Ironweed
 - Prairie Milkweed
 - Riddell's Goldenrod
 - Slender Blazing Star
 - Stiff Goldenrod
 - Swamp Rose-Mallow
 - Tall Blazing Star
 - Tall Tickseed
 - Winged Loosestrife

In order to identify site specific terrestrial environment constraints further studies are recommended in **Section 5.4**.

2.6.1 FOREST REGION

The study area is located in the Deciduous Forest Region. This region lies along the northern shores of Lake Erie and Ontario and the southeastern shore of Lake Huron. Forests in this region are dominated by broadleaved trees including sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), basswood (*Tilia americana*), red maple (*Acer rubrum*), red oak (*Quercus rubra*), white oak (*Quercus alba*), bur oak (*Q. macrocarpa*), butternut (*Juglans cinerea*), bitternut hickory (*Carya cordiformis*), rock elm (*Ulmus thomasi*), silver maple (*Acer saccharinum*) and blue beech (*Carpinus caroliniana*).

Species such as black walnut (*Juglans nigra*), sycamore (*Platanus occidentalis*), swamp white oak (*Quercus bicolor*) and shagbark hickory (*Carya ovata*) are also occasionally present, along with species considered rare to the province such as Kentucky coffee-tree (*Gymnocladus dioica*) and pin oak (*Quercus palustris*) (Rowe, 1972).

2.6.2 DESIGNATED NATURAL AREAS

2.6.2.1 Wetlands

As stated in **Section 2.1**, there are Significant Natural Areas designated in the Lambton County OP. The closest Significant Natural Area to the study area is the Bickford Oak Woods Wetland Complex. It is a 308 ha woodlot, about 2.4 km south, that has many rare species including pin and Shumard oak, American sycamore and flowering crabapple. Bickford is best known as the only site in Canada where swamp cottonwood (*Populus heterophylla*) has been identified.

The next closest Significant Natural Area to the study area is the Burton Drain Woodlot. It is a provincially significant wetland (PSW) approximately 3.4 km east of the study area. The wetland is formed by isolated pockets of standing water that are not connected to the study area.

These two areas are shown in **Appendix A, Figure 5**.

2.6.2.2 Areas of Natural and Scientific Interest (ANSIs)

There are no ANSIs identified in the study area.

2.6.3 SIGNIFICANT WOODLANDS

A woodland is defined as a treed area, woodlot or forested area. The Natural Heritage Reference Manual notes that the local planning authority has a responsibility for designating significant woodlands, significant valleylands and significant wildlife habitat using criteria that include size, ecological function, uncommon characteristics and economic and social functional values (MNR, 2010).

In Lambton County, significant woodlands are protected as an environmental protection area designation in the OP. Significant Woodlots are those located in a Primary Corridor or Significant Natural Area designations, or any contiguous forested area that is 4 hectares, or greater in size.

The study area contains a woodland larger than 4 ha that should be avoided where possible. The preferred route does not impact the significant woodland.

2.6.4 SIGNIFICANT WILDLIFE HABITAT

Wildlife habitat is defined as an area where plants, animals and other organisms live, including areas where species concentrate at a vulnerable point in their life cycle and that are important to migratory and non-migratory species (MNR, 2000).

Significant wildlife habitats are grouped into four categories:

1. Seasonal concentration areas
2. Animal movement corridors
3. Rare vegetation communities or specialized habitats
4. Habitats of species of conservation concern

While not part of the technical definition of significant wildlife habitat, wildlife habitat does of course exist for species at risk. The identification of these habitats along the preferred route will result from the studies recommended in **Section 5.4**.

2.7 SOCIO-ECONOMIC ENVIRONMENT

2.7.1 MUNICIPAL STRUCTURE

The study area is located south east of the Town of Corunna and north east of the Town of Mooretown, St. Clair Township, Lambton County. The County is largely rural, with a concentration of urban development occurring north in the City of Sarnia. The urban population density is servicing the petro-chemical industry prevalent in the area.

The County government provides services such as emergency medical services, and waste/recycling pick up. The County is also responsible for establishing the Lambton Official Plan and establishing broad planning policies. Each Township is responsible for its own Official Plan which establishes land use and zoning by laws. In addition, each municipality is responsible for a variety of local services.

2.7.2 POTENTIAL CONTAMINATED SITES

Landfills

Landfill locations in the study area were determined through a review of the Ministry of Environment's (MOE) Waste Disposal Inventory (MOE, 1991), Official Plan maps and the MOE's Landfill Inventory Management Ontario document found on the Ministry's website (MOE, 2011a).

One active landfill has been identified as being 1.7 km south east of the study area. The location of the active landfill can be seen in **Appendix A, Figure 6**.

Contaminated Sites and Former Industrial Sites

Contaminated sites in the study area were determined through reviewing Official Plans and the MOE Brownfield's Environmental Site Registry (MOE, 2011b). These resources have helped to confirm that there are no potentially contaminated sites in the study area (**Appendix A, Figure 6**). It is possible that additional yet undiscovered sites may exist in the study area.

2.7.3 CULTURAL HERITAGE RESOURCES

As a component of the environmental assessment for the proposed Payne-Sarnia Pipeline project a built and cultural heritage overview assessment was conducted. The result of the overview assessment was that two properties in the study area and three properties adjacent to the south were identified. As well, a Cultural heritage site was identified approximately 900m south east of the study area.

In order to determine the archaeological resource potential, a licensed archaeological consultant will conduct an archaeological assessment along the preferred pipeline route.

2.7.4 INFRASTRUCTURE

Infrastructure identified for the purpose of this project includes roads, hydrocarbon facilities, hydroelectric facilities, railways, and other utilities such as water and communication lines.

Roads

In the study area, there are four roads; Rokeby Line, Moore Line, Ladysmith Road and Highway 40. Rokeby Line, Moore Line, Ladysmith Road are township roads and Highway 40 is provincially maintained highway.

Hydrocarbon Facilities

Several oil and gas transmission pipelines are located in the study area. There are various distribution lines in the road allowances around the study area and two transmission pipelines buried east west through the middle of the study area. As well, there are underground natural gas storage areas which enter the study area. Union Gas will have all buried facilities identified prior to construction.

Electrical Facilities

Low voltage electric transmission lines are present throughout the road right-of-ways in the study area. Low voltage distribution lines consist of wooden or concrete poles that support lines conducting 13.5 to 44 kV. Electrical lines along the preferred route will be identified prior to construction.

Railways

The study area contains an active CN railway system which services the industrial properties on the west side of the study area. The preferred route does not impact the railway lines in the study area.

Other Utilities

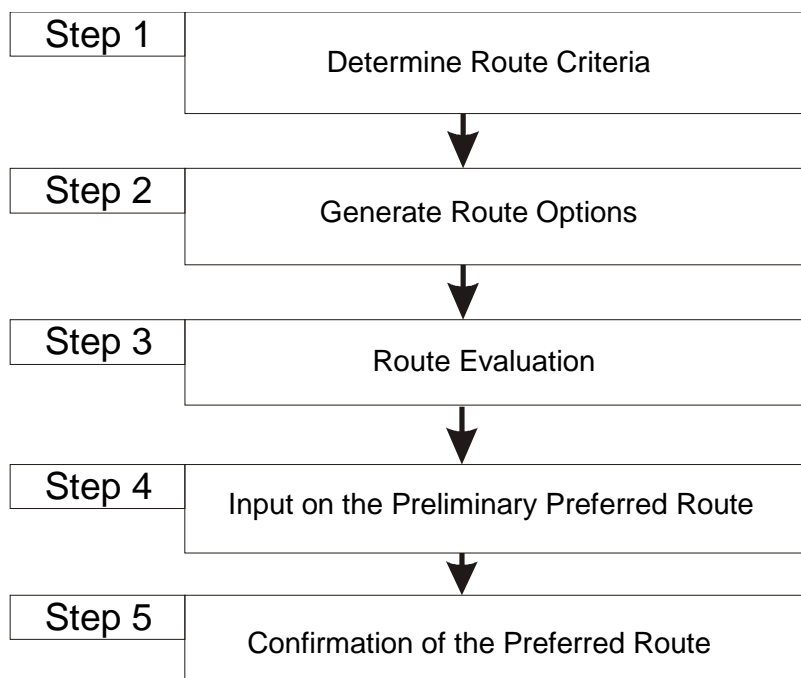
A variety of other buried and overhead utilities (telephone, fiber optic, water mains, etc.) are located in road right-of-ways in the study area. The locating of buried and overhead utilities will occur by Union Gas's pipeline contractor prior to construction.

3.0 Route Selection

3.1 ROUTE EVALUATION PROCESS

The route evaluation process was undertaken as per the OEB *Environmental Guidelines (2011)* which identify the environmental and socio-economic features to take into consideration and the principles to be considered during the route evaluation. The preferred route for the proposed Payne-Sarnia Pipeline was selected through a five-step process, illustrated in **Figure 3.1**.

Figure 3.1: Route Evaluation Methodology



3.2 STEP 1: DETERMINE ROUTE CRITERIA

Routing Objectives

The process of developing alternative routes commenced with the identification of routing objectives for creating reasonable and/or feasible alternatives. These include:

1. Routes should follow a reasonably direct path between end-points, thus minimizing length as well as potential for environmental and socio-economic effects

2. Routes should avoid sensitive environmental and socio-economic features to the extent possible; where they cannot be avoided routes should be located to minimize effects
3. Existing linear infrastructure should be utilized to the greatest extent possible in order to minimize effects to previously undisturbed land and/or constrain future land development
4. Where new easements are required, existing lot/property lines should be followed to the extent possible study area

The criterion for delineating the study area is provided in **Section 2.2**.

Environmental and Socio-Economic Constraints and Opportunities

The route selection process was conducted as per the OEB *Environmental Guidelines (2011)*. Chapter 4 of the OEB *Environmental Guidelines (2011)*, 'Route or Site Selection', outlines the environmental and socio-economic features that should be considered during route evaluation.

A GIS-based environmental inventory was developed to identify existing features in the study area considered either as pipeline routing constraints or opportunities. Environmental constraints are existing features, such as wetlands, that meet the following criteria:

- Site-specific mitigation measures would be required to minimize potential effects
- The feature has been selected or designated for protection
- The feature has been recognized through local, regional, provincial, or federal policy, plan, or statute, or is otherwise valued as an environmental or socio-economic resource

Environmental opportunities are existing features, such as property lines or existing linear infrastructure, which provide a suitable location for the alignment of a pipeline.

Existing features were identified using relevant published literature, maps and digital data, and discussions with agencies and municipalities. The location and extent of environmental and socio-economic features are illustrated in **Appendix A** and discussed in **Section 2**.

3.3 STEP 2: GENERATE ROUTE OPTIONS

To generate route options, environmental and socio-economic constraints were considered for which site-specific mitigation measures would be required to minimize potential effects. Examples of constraints considered during this stage included wetlands complexes, woodlots, settlement areas, residences and watercourses containing known aquatic species at risk. Examples of opportunities considered during this stage included road easements, pipeline easements, hydroelectric corridors, lot lines and rail lines.

Generation of route options was based on the routing objectives, study area, and environmental and socio-economic constraints and opportunities identified in Step 1. Route generation was conducted by staff of Stantec and Union Gas, using aerial photography interpretation, and mapping of existing environmental and socio-economic constraints and opportunities. Also, on two separate occasions pre-consultation meetings occurred with staff from St. Clair Township to discuss the project and proposed routes.

Three routes were identified to be reasonably feasible, environmentally acceptable and constructible (**Appendix B, Figure 1**) options to transport product between the start and end points. The route options follow existing linear infrastructure, and avoid to the extent possible natural and built cultural heritage features such as wetlands.

3.4 STEP 3: ROUTE EVALUATION

Evaluation Methodology

The three alternative routes were subject to a comparative evaluation. The goal of the comparative evaluation was to determine the potential environmental and socio-economic effects of constructing and operating each route.

The three route options were evaluated through comparing geographic information system (GIS)-based information databases. The evaluation commenced with the delineation of corridors along which potential impacts would be calculated. Corridors were sited on the centerline of roads and right-of-ways, with the intention that micro-siting would occur during detailed design.

Following delineation, corridor segments were intersected with select environmental and socio-economic base data acquired from relevant published literature, maps and digital data. Categories of intersected features include:

- **Route Characteristics:** Length
- **Agricultural:** Canada Land Inventory Classification for Agriculture, Lambton County Soil Survey, and Overburden thickness
- **Aquatic:** Watercourse Crossings, Water Wells
- **Socio-Economic:** Homes/farm operations, commercial businesses, Industrial properties
- **Terrestrial:** Potential for SAR and their habitats, designated natural areas (wetlands woodlots, etc.)
- **Community Heritage:** Built and Cultural Heritage Features

3.4.1 Route Characteristics

Comparing the total length of alternative routes is appropriate as a broad scoping tool that yields a measurement relating to total disturbed area. As displayed on Map #1 Alternative Routes, the longest pipeline alternative route is Alternative #1 which incorporates segments A, E and F ($3977 + 1367 + 1194 = 6538$ m). Next in length is Alternative #2 which is the combination of B, C, E and F ($523 + 1823 + 1367 + 1194 = 4907$ m). The shortest pipeline route of the three is Alternative #3; it is the combination of B, D and F ($523 + 3155 + 1194 = 4872$ m).

Table 3.1: Route Length Summary Table	
Alternative Route	Route Length (m)
# 1	6538
# 2	4907
# 3	4872

3.4.2 Agricultural Characteristics

The Canada Land Inventory for Agriculture (CLI) system of land classification ranges between Classes 1-7. Lands identified as CLI Class 1 represent the best quality agricultural land and Class 7 is the poorest. The lands along the potential routes are mapped as CLI Classes 2 and 3.

The soils along the three potential routes are mapped in the Lambton County Soil survey as either Caistor Clay or Brookston Clay. Alternative #1 is mapped in the County level soil survey as Caistor Clay (CLI Class 3). Alternative #2 is also mapped as Caistor Clay (CLI Class 3). Alternative #3 is about 40% Caistor Clay (CLI Class 3) and 60% Brookston Clay (CLI Class 2). From an agricultural perspective, Caistor Clay is similar to Brookston Clay (CLI Classes 3 and 2 respectively). They are differentiated by drainage and hardness.

Overburden thickness across the study area ranges between 30 and 50 m. This range is fairly deep and is not considered to be a constraint to the construction or operation of a pipeline. For this reason, overburden thickness was not compared among the alternative routes.

Table 3.2: Agricultural Summary Table	
Alternative Route	Soil Series Name (CLI)
# 1	Caistor (3)
# 2	Caistor (3)
# 3	Brookston (2) 60% Caistor (3) 40%

3.4.4 Aquatic Characteristics

It is understood that the study area is serviced with municipal water and assumed that houses are on the municipal services. Under the presumption that some of the rural properties utilize existing water wells for livestock or irrigation of gardens etc., the numbers of deep and shallow water wells listed on the Lambton County electronic environmental mapping system were compared.

Generally, minimizing the number of watercourse crossings along the preferred route helps to minimize the impacts of pipeline construction. The numbers of watercourses, including municipal drains, were compared along the three alternatives.

Table 3.3: Aquatics Summary Table	
Alternative Route	Water courses – Water Wells
# 1	5 - 11
# 2	6 - 3
# 3	3 -10

3.4.5 Socio-Economic Characteristics

To assess the alternative routes with respect to minimizing the socio-economic effects, the number of houses or farms, commercial businesses, industrial lands and farm operations along each route were counted and compared.

Table 3.4: Socio-Economic Summary Table	
Alternative Route	Houses/Farms – Businesses – Industrial
# 1	12 – 0 – 2
# 2	0 – 0 – 2
# 3	7 – 0 – 2

3.4.6 Terrestrial Characteristics

In order to determine what terrestrial features might become identified as constraints to the project, a preliminary desktop investigation of published information was conducted on each of the three alternative routes. As well, a preliminary site investigation was undertaken to confirm information gathered during the records review and to assess the potential for encountering protected species or habitats. Subsequently, a terrestrial baseline conditions report was written.

The terrestrial baseline conditions report outlines potential habitats present and summarizes recommended field studies. The terrestrial summary table, below, displays the number of terrestrial field studies recommended for each alternative route based on the potential of effecting them during construction and operation of their proposed pipeline. Avoiding the

potential species at Risk and habitats will help minimize the effects to the surrounding environment.

As well, the amount of woodlot tree cutting that would be required was considered.

Table 3.5: Terrestrial Characteristics Summary Table

Alternative Route	Number of Terrestrial Studies Recommended – Linear Length of tree cutting required (m)
# 1	7 - 290
# 2	11 - 2015
# 3	7 - 0

3.4.7 Community Heritage Characteristics

To assess the potential for built and cultural Heritage features along the three alternative routes, a Built and Cultural Heritage Overview was conducted on the study area. The natural heritage study included consultation with the Ministry of Tourism, Culture and Sport (MTCS), the Ontario Heritage Trust (OHT) and the Town of Mooretown. As well, published mapping and data was referenced. In the report, six potential heritage resources were determined to be situated within the study area. They are summarized in the Table below.

Table 3.6: Community Heritage Summary Table

Alternative Route	Heritage Sites
# 1	5
# 2	2
# 3	0

3.5 DISCUSSION OF ASSESSMENT

A review of the potential environmental and socio-economic impacts along the alternative routes was conducted on six categories of characteristics. This report section discusses the evaluation and associated weight the characteristics were given. The Assessment Summary Table below shows the results of the evaluation.

Minimizing the total physical disturbed area is preferable to minimize the overall impact of the construction footprint. Based on the physical characteristics evaluated, Alternative Route #3 is preferred.

Alternative Routes #1 and #2 are mapped as Class 3 lands and #2 is Class 2 and 3 lands. However, CLI Classes 1-3 are generally considered prime agricultural land and from a planning perspective, prime agricultural lands (CLI Classes 1-3) are usually protected equally. Additionally, Alternatives #1 and #3 allow for the use of existing road allowances to locate the pipe.

Construction, within road allowance minimizes impacts to agricultural land. Where the pipe is located within road allowance, temporary work room could be required outside the road allowance on agricultural land during construction. Based on the agricultural characteristics assessed all sites are considered equally preferred.

The number water wells and number watercourse crossings were compared among the alternative routes. A water well monitoring program may be conducted to help ensure that local water wells are not impacted. For this reason the number of wells in proximity to the routes was not considered a significant impact. The number of watercourse crossings, while a mitigatable effect, was an important route selection feature. Based on the aquatic characteristics assessed, Alternative Route #3 is preferred.

Socio-economic effects to local residents and businesses were assessed with respect to the potential for disturbance during construction. In that, the number of homes/ farms, business and industrial lands were counted. Based on the socio-economic characteristics assessed, the preferred route from a socio-economic perspective, is alternative route #2 due to the lack of road frontage.

Route #2 would impact significantly more woodlot trees than the other routes, while Route #3 would require the least. Based on the amount of woodlot trees to be cut and the potential for encountering species at risk or their protected habitats, Route #3 is preferred from the terrestrial features perspective.

The most effective mitigation method for preserving community heritage features is avoidance. Based on the study conducted, Route #3 is preferred to avoid the potential for encountering built and cultural heritage features.

Table 3.7: Assessment Summary Table

Evaluation Characteristic	Ranking of Alternative #1	Ranking of Alternative #2	Ranking of Alternative #3
Route Characteristics	3	2	1
Agricultural Characteristics	3	2	1
Aquatic Characteristics	2	3	1
Socio-Economic Characteristics	3	1	2
Terrestrial Characteristics	2	3	1
Community Heritage Characteristics	3	2	1
TOTALS	16	13	7

3.7 STEP 4: INPUT ON THE PRELIMINARY PREFERRED ROUTE

An Information Session was held on March 11, 2014 from 4:00 p.m. to 7:00 p.m. at the Mooretown Sports Complex to provide details on the Payne-Sarnia Pipeline Project and to receive feedback on the route evaluation and preliminary preferred route. Consultation meetings also occurred with staff from St. Clair Township where the preferred running line was reviewed in detail and comments were received.

3.8 STEP 5: CONFIRMATION OF THE PREFERRED ROUTE

Following the comparative evaluation (**Section 3.5**) and based on input received (**Section 3.6**) the preliminary preferred route was confirmed as the preferred route. The location of the preferred route is shown in **Appendix B, Figure 2**.

The alignment of the preferred route is currently illustrated with a general location. Detailed design is being undertaken by Union Gas to determine the exact location of the permanent easement. The detailed design involves communicating with all landowners to determine needs for site specific design features and any temporary land use requirements. The exact pipeline location will also be determined based on consultation with landowners, existing infrastructure and Agencies. Future field investigations described in Section 7 may also help determine the detailed design.

4.0 Consultation Program

Consultation and engagement is an essential requirement of the *OEB Environmental Guidelines* (2011). Consultation and engagement is the process of identifying interested and potentially affected parties and informing them about the Project, soliciting information about their values and local environmental and socio-economic circumstances, and receiving advice about key project decisions before those decisions are finalized.

The consultation program for this project included the following objectives:

- Identify interested and potentially affected parties early in the process
- Inform and educate about the nature of the project, potential effects and how to participate in the consultation program in a clear, concise, relevant and timely manner
- Provide a forum for the identification of comments
- Identify how input will be used in the planning stages of the project
- Summarize issues for resolution, and resolve as many issues as possible
- Revise the program to meet the needs of those being consulted, as appropriate
- Maintain ongoing communication throughout the construction and operation phase of the project

4.1 CONSULTATION AND COMMUNICATION

4.1.1 Contact Lists

The identification of interested and potentially affected parties was undertaken using a variety of sources, including the OEB's OPCC Members List, the MOE's Environmental Assessment Government Review Team Master Distribution List, and the experience of Union Gas and Stantec.

The parties listed below were considered when identifying the initial First Nations, Métis Nation and Agency Contact List:

- Federal and provincial agencies and authorities with jurisdiction in the study area, including members of the OPCC
- Municipal staff
- Special interest groups
- First Nation communities and the MNO

The initial contact list was updated as the environmental study unfolded, due to changes in staff, correspondence received and attendees at meetings. The final Stakeholder Contact List is located in **Appendix D1**.

Members of the public who responded to newspaper notices or who attended the Information Session were tracked in a Public Contact List. Landowners adjacent to all route options were identified through a search of municipal tax rolls and were tracked in a Landowner Contact List. Union Gas also undertook direct consultation with elected officials.

4.1.2 Consultation and Communication Methods

4.1.2.1 Newspaper Notice

To announce the project and to give details of the information session, a notice of Initiation of Environmental Study and Information Session was published in the Sarnia Observer (February 28, 2014) and Sarnia Lambton This Week (March 6, 2014). The Notice described the project, the study area, the preferred route, the environmental study process, the details of the information session and listed project team contact information.

A copy of the newspaper notice is located in **Appendix D2**.

4.1.2.2 Mailouts

Letters were mailed to the initial First Nations, Métis Nation and Agency Contact List on February 27, 2014 to inform them of the commencement of the project, provide a map of the study area with the preliminary preferred route, and solicit information on existing principles or guidelines that may affect the project, background environmental and socio-economic information, and other developments proposed in the study area.

A generic copy of the mail out is located in **Appendix D3**.

4.1.2.3 Display Boards, Newsletters and Exit Questionnaires

Display boards were developed for the Information Session. The display boards for the Information Session provided information on the project, the regulatory process, route options, existing features, Union Gas and next steps.

Exit questionnaires were also provided to Information Session attendees. The exit questionnaire for the first Information Session requested feedback on environmental features, potential effects to the attendee, and the content and organization of the Session.

Copies of the display boards, newsletters and exit questionnaires are located in **Appendix D4**.

4.2 RECEIVING INPUT

The consultation and engagement program allowed interested or potentially affected parties to provide input into the project. Input was evaluated and integrated, where reasonable and feasible, into the project. Complete copies of public, agency, interest group, municipal, First Nations and Métis Nation correspondence, are located in **Appendix D5**.

4.2.1 Public Input

4.2.1.1 Input

An Information Session was held for the project. The Information Session occurred on March 11, 2014 from 4:00 p.m. to 7:00 p.m. at the Mooretown Sports Complex in Mooretown, Ontario.

The purpose of the Information Session was to provide attendees an opportunity to:

- view information about the project
- ask questions and comment on the planning process followed
- comment on the preliminary preferred route

At the Information Session, Union Gas and Stantec representatives were present to provide information, answer questions and receive comments. Display boards and newsletters were provided to inform attendees about the project, and exit questionnaires were provided to encourage feedback (see **Section 4.1.2.3**).

The number of attendees at the Information Session was recorded. There were 14 registered attendees. Attendees included representatives from local businesses, local landowners and members of the public. All attendees who registered their attendance had their contact information added to applicable contact lists to ensure they received future project notices.

An exit questionnaire was provided for attendees to submit questions and comments. Two Information Session questionnaires were returned. One was from a local resident which indicated that the person is a directly affected landowner and an adjacent landowner. It states that they did not get the information they were looking for at the meeting. The returned questionnaire other was from an industrial operation located along the preferred route. Both questionnaires were followed-up by Union Gas.

After receiving the questionnaire from the landowner, a Union Gas Lands Representative contacted and met with them to discuss the details of the project.

Communications were also had with the representative from the industrial operation. The main issue raised was in regards to construction not interrupting their access from the roadway. This issue could be resolved at the detailed design stage.

Union Gas is planning to locate the pipe in a location that eliminates the issue. If that location is not satisfactory with all parties, mitigative measures can be implemented that will minimize or eliminate the impact.

In addition to the comments received at the Information Session, further input was received through email.

The main areas of comments/concerns involved:

- If routing on the road in front of the house doesn't work it can be routed around on the property lines;
- Route number 1 wouldn't impact the tile drains on my property.

4.2.1.2 Refinements Based on Input

Route option preferences from the public were taken into account when finalizing the preferred route (see **Section 3.7**). The location of the Preferred Route will avoid net impacts where possible to existing residential homes, tile drainage infrastructure and existing businesses.

4.2.2 Agency and Interest Group Input

4.2.2.1 Input

Relevant federal and provincial agencies, authorities and Interest groups were provided mail outs as noted in **Section 4.1.2.2**. A response email was received from the Technical Safety and Standards Authority (TSSA). The response asked if routing a direct path, start to end points was considered in the alternative route process. A response was also received from the Ontario Ministry of the Environment. The stated they have no concerns or comments to offer at this time.

4.2.2.2 Refinements Based on Input

No refinements to the project or recommended mitigation or protective measures were developed as a result of agency and interest group input.

4.2.3 Municipal Input

4.2.3.1 Input

Staff members from Lambton County and St. Clair Township were included in the mail out which invited them to provide comments, or coordinate comments, regarding the preliminary preferred corridor. No response to the mail out letter from municipal governments has been received by Stantec.

Meetings were held before and after the Information Session with St Clair Township and the latter meeting resulted in revisions to the route as shown at the Information Session.

It came to light that there is significant buried infrastructure at a particular road intersection that could be avoided. Subsequently, the crossing at the intersection of Ladysmith and Rokeby was changed to a diagonal crossing and the alignment west of Hwy 40 was moved from the south side of the road to the north side. The alignment was also altered on Rokeby Line to accommodate existing drainage infrastructure.

Pre-consultation Meetings

Pre-consultation meetings were held in the fall of 2013 to review the various routes proposed.

4.2.3.2 Refinements Based on Input

Municipal input was received and refinements to the detailed design resulted.

4.2.4 First Nations and Métis Nation Input

4.2.4.1 Input

Union Gas has been in contact with First Nations and Métis communities. They provided updates on their projects including the Payne-Sarnia Pipeline project. No concerns have been expressed to date.

4.2.4.2 Refinements Based on First Nations and Métis Nation Input

No issues have been raised. No refinements have been developed.

4.3 SUMMARY

At each stage of the consultation program input was solicited from the residences and the identified potentially interested parties. Responses were provided, as applicable, to questions and concerns received. Concerns identified during the consultation program have been resolved to the extent possible primarily through selection of a preferred route that minimizes potential effects on environmental or socio-economic features, through clarification by project team members, or during the detailed design stage. Union Gas has committed to on-going consultation with interested or potentially affected parties through construction, and will continue to respond to stakeholder concerns through the life of the project.

5.0 Effects Assessment

5.1 EFFECTS ASSESSMENT OVERVIEW

The environmental and socio-economic information presented in the ER is based on sources cited throughout the ER. The potential effects of the Project have been assessed by comparing the description of the environmental and socio-economic setting (**Sections 2.4-2.7**) against construction and operation activities (**Sections 5.1.1 and 5.1.2**). Mitigation and protective measures were identified where appropriate for each effect, including:

- Construction methods and timing;
- Environmental protection measures;
- Site-specific mitigation measures;
- Compensation measures; and,
- Monitoring and contingency measures.

Environmental and socio-economic effects have been avoided or minimized to the extent possible through the route selection process, or will be addressed through the methods listed above.

5.1.1 Construction

The pipeline construction process includes various works and activities as described below:

1. **Surveying and Staking:** The first crew to enter the construction site is typically the survey and staking crew who delineate the boundaries of the right-of-way (RoW) and temporary work areas.
2. **Clearing:** Next, the clearing crew braces and cuts all fences crossing the RoW and installs any required temporary gates. This crew also clears sufficient brush, trees and crops on the RoW to permit construction of the pipeline.
3. **Where appropriate, preconstruction agricultural tiling** will be undertaken in consultation with landowners.
4. **Grading and Stripping:** Next, the grading crew prepares the RoW for access by construction equipment. At this stage, the topsoil (on agricultural lands) or the duff layer (on natural lands) is stripped by graders and/or bulldozers then segregated so it will not be mixed with the subsoil later removed from the trench.

5. Stringing: Subsequent to trenching, the stringing crew lays pipe on wooden skids adjacent to the trench area. In some cases, such as in agricultural areas, trenching is undertaken after stringing thus allowing the stringing trucks to travel down the centre of the proposed trench to minimize compaction.
6. Trenching: Once the RoW has been graded, a trenching machine or hydraulic hoe can begin excavating a trench. In areas of shallow bedrock, blasting may be required to excavate the trench. Laneways and driveways are left over the trench as long as possible where requested by the landowner. In agricultural areas, tiles that are cut during the trench excavation are flagged and repaired as quickly as possible.
7. Pipe Fabrication and Lowering: Next, the pipe is bent as required and the welding crew welds the pipe into joined sections. The pipe welds are x-rayed and coated then inspected before the pipeline is lowered into the trench. Crews will also install pipes under obstacles such as roads or watercourses through a variety of different means, including boring, dam and pump, and horizontal directional drilling.
8. Backfilling: The backfilling crew backfills the originally excavated subsoil over the pipe in the trench. In rock or excessively stony areas, the pipe may be sand-padded to protect the coating. In shallow water table areas, the pipeline may be weighted to provide negative buoyancy. In agricultural areas, after the trench is backfilled, a tiling crew repairs any disturbed or broken tiles. Landowners with tile drainage are given the opportunity to inspect tile repairs. A tile consultant may be retained to oversee tile repairs and the design of a header tile system if required.
9. Hydrostatic Test: The pipeline is then tested hydrostatically. Water is typically drawn by permit from nearby water sources such as watercourses or lakes, if available. Municipal water may at times also be used for hydrostatic testing. Upon completion of the hydrostatic testing, the pipeline is purged of air and packed with natural gas.
10. Clean-Up and Restoration: The clean-up crew is responsible for the final restoration of the RoW and other work areas. On agricultural land, this may require decompaction of the subsoil (i.e. chisel ploughing) and stone picking to maintain productivity. In natural areas the clean-up crew undertakes final restoration including re-seeding of the RoW and restoring ditch banks, stream crossings and wetland areas.

5.1.2 Operation and Maintenance

Pipeline operation consists of gas flowing through the pipeline. The initial gas pressure in the pipeline is generated at the compressor stations. Mainline valves located at valve sites located periodically along the pipeline system serve to shut off and isolate a particular section of pipeline for maintenance and security purposes.

Above-ground facilities along the pipeline include valve sites, post-mounted signs identifying the pipeline, fence stiles and small "test boxes" which are located along fence lines at roads and are used to test the corrosion protection system.

Once the pipeline has been put into operation, the following activities are undertaken to patrol and maintain the pipeline:

- 'Line walk' of the entire pipeline by Union Gas personnel once a year.
- Checking cathodic corrosion protection
- Review of operating conditions of pipeline facilities such as valve sites

5.2 PHYSICAL ENVIRONMENT

5.2.1 Bedrock Geology

Potential Impacts

The Paleozoic geography of the study area indicates that the bedrock underlying the study area is from the Kettle Point Formation (Hewitt, 1972). It is black fissile, bituminous shale generally found between 40-50 m below grade and surface outcrops are uncommon in the area. No outcrops have been identified in the study area. Consequently, bedrock is not expected to be encountered during construction of the pipelines or access roads.

Mitigative/Protective Measures

The proposed construction project will involve excavations less than 10 m deep. Contact with bedrock is not expected therefore impacts relating to the bedrock are not anticipated. Mitigative measures for bedrock are not required.

Net Effects

No net effects to the bedrock geology are anticipated.

5.2.2 Physiography, Topography & Surficial Geology

Potential Impacts

The study area is located in the St. Clair Clay Plains physiographic region of Southern Ontario (Chapman and Putnam, 1984). This clay plain has developed under historical glacial lakes and contains some sandy till but is mainly the finer textured silt and clay (Barnett et al., 1991). Topography around the study area is level to nearly level and the texture is fairly heavy. Subsequently, slope stabilization and erosion are not anticipated to be a concern. Surface deposits in the area are generally deeper than 35 meters.

Mitigative/Protective Measures

Exposed soils should be monitored for erosion and stability loss potential. If conditions warrant, appropriate mitigation action should be taken. Due to the levelness of the study area and deep depth of sediments, mitigation measures are not required.

Net Effects

No significant adverse residual effects on or from physiography, topography and surficial geology are anticipated.

5.2.3 Soil and Soil Capability

5.2.3.1 Surficial soils

Potential Impacts

Micro-siting of the proposed pipeline project will likely include construction within road allowances and on agricultural lands, and therefore there is the potential to impact agricultural soils found in the study area. Generally, topsoil has a higher organic matter content that increases its' water holding capacity and resilience compared to subsoil. During construction, excessive passes with heavy equipment on topsoil can result in damage to the point of greatly diminished crop productivity. For this reason, topsoil may be stripped from the working areas of the project depending on the landowner. Soil characteristics relating to the potential for damage include: Soil structure, moisture content, texture, organic matter content.

During construction, soils with no vegetative cover are more prone to erode. This can result in soil erosion from water and wind. Soil susceptibility to water erosion depends on a number of variables, including; intensity and duration of rainfall events, antecedent soil moisture, surface soil cover, slope, soil texture, soil structure and organic matter content. Similarly, the susceptibility of soils to wind erosion depends on wind speed, surface soil cover, soil texture, soil structure and organic matter levels. Water and wind erosion both can result in a significant loss of topsoil.

Soybean cyst nematode (SCN; *Heterodera glycines*) is known to be in the area. It lives in the topsoil and can reduce crop yields in severely impacted fields. It can be spread by the movement of soil from one impacted field or property to another non-impacted field. This soil can be stuck on machinery etc.

Mitigative/Protective Measures

Where topsoil is stripped from the agricultural portions of the pipeline right of way, it should be stripped during moderately dry soil conditions and stockpiled for use during cleanup and rehabilitation. Identification of the topsoil and subsoil interface should be carefully monitored to ensure that all topsoil with limited subsoil is stripped. To reduce construction impacts associated with wet climatic conditions, the other components of the construction are recommended to

occur during moderately dry soil condition as well. If construction cannot be completed during the drier summer months when evapotranspiration is greatest, strict adherence to Union Gas's construction specifications pertaining to work on agricultural lands is recommended.

Following periods of excessive rainfall or saturated soil conditions, construction activities on agricultural lands should be suspended in accordance to Union Gas's Wet Soils Shutdown practice. When wet weather shutdown has been implemented, heavy tracked and rubber-tired vehicles should be restricted from movement on agricultural lands. Usually, construction may continue from gravel work surfaces during wet weather conditions.

If SCN is identified on the RoW, movement from fields identified as having SCN to fields not identified as having SCN should be restricted in all stages prior to completion of the topsoil stripping stage. As discussed in **Section 7.2.2**, a SCN Management plan would be created if necessary.

Topsoil stripping, handling and storage will be independent from subsoil material to minimize mixing and compaction. Topsoil stripping on the right of way should be sufficiently wide to ensure that topsoil will be stockpiled on topsoil and subsoil will be stockpiled on subsoil. Union Gas should maintain separation between topsoil storage piles and subsoil storage piles to reduce potential for soil mixing. If topsoil is required to be imported it should be tested for SCN to ensure that it is not contaminated (**Section 5.5.5**).

Net Effects

With the effective implementation of the above mitigation and protective measures, no significant adverse residual effects to topsoil or soil capability are anticipated.

5.2.3.2 Subsurface Soils

Potential Impacts

Where topsoil is stripped, it is stockpiled away from construction traffic to reduce the potential for impacts. However, deep compaction and breakdown of structure and/or tilth of the exposed subsoil may result from the movement of heavy equipment during construction.

The majority of the study area is covered with Brookston Clay and the remainder is Caister Clay (**Appendix A, Figure 3**). Clay soils can be susceptible to rutting and compaction which can severely reduce agricultural productivity. An increase in moisture levels in these soils further increases the susceptibility to compaction damage. Additionally, careless topsoil stripping, topsoil storage and topsoil replacement can result in unnecessary mixing of topsoil and subsoil that can also reduce agricultural productivity.

On the areas that contain Brookston soils, blue clay is known to be found at depth in the permanently anaerobic part of the soil. Blue clay tends to be structureless and tends to be very hard when dry.

Mitigative/Protective Measures

Adherence to the Union Gas construction specifications will help to protect the subsurface soils during construction.

It is not anticipated that blue clay will be encountered during the installation of the pipelines, however, in the event that blue clay is encountered on agricultural lands, it should be replaced to the depths it was found because it may cause issues with soil productivity if backfilled into the upper layers of the subsoil. Alternatively the blue clay could be removed and disposed of at an approved location. Subsequently, the trench would be backfilled with suitable replacement material.

Once construction has been completed, all the areas that will be returned to agricultural production should be deep tilled using an agricultural subsoiler to relieve soil compaction caused during construction. In situ compaction testing can be conducted in the field to confirm that compaction levels on the RoW are similar or less than that of the adjacent lands. Stone picking should be conducted after subsoiling.

5.2.4 Extractive Resources

Potential Effects

The preferred route will not cross any lands currently utilized for resource extraction, or land on which future resource extraction is likely.

Mitigation and Protective Measures

As no potential effects will occur to extractive resources as a result of the project, no mitigation or protective measures are recommended.

5.2.5 Natural Hazards

Potential Effects

The probability of significant seismic activity in the area traversed by the preferred route is low, and therefore no potential effects are anticipated.

A flooding event during construction could result in construction delays, sedimentation, and construction equipment entering a watercourse. The nature of these effects would depend on the spatial extent, duration and magnitude of the event.

Mitigation and Protective Measures

If flooding necessitates a change in the construction schedule, landowners and regulatory agencies should be notified as appropriate and construction may continue at non-affected locations. Workspaces for all watercourse crossings should be located on site plans submitted for permitting by the St. Clair Conservation Authority.

Net Effects

With the effective implementation of the above mitigation and protective measures, no significant adverse residual effects from natural hazards are anticipated.

5.3 AQUATIC FEATURES

5.3.1 Fish and Fish Habitat

Potential Impacts

There are no aquatic species at risk or associated habitats identified by the Ministry of Natural Resources or Fisheries and Oceans Canada in the study area. This includes fish and mussel species. The drainage ways in the study area should be considered as contributors of runoff and tile drainage water after significant rainfall events to fish habitats further downstream. The potential exists for construction activities near contributing drainage ways to result in impacts to fish habitat further downstream.

Mitigative/Protective Measures

In order to avoid impacting downstream fisheries care must be taken when working around water ways to ensure that contributing waters are not impacted. Appropriate spill response plans and sediment and erosion control measures such as those described in the Union Gas construction specifications will be implemented. Additionally, if any "Near Water Works" are completed a slope stabilization plan and vegetation rehabilitation plan shall be designed and implemented within the disturbed areas.

If a waterway is to be drained or in water work is planned along the RoW the work area will be isolated and a fish rescue will be performed at the time of construction. Fish will be moved to an appropriate location upstream or downstream of the isolated area within the same aquatic system.

5.3.2 Watercourses

Potential Impacts

Due to the relatively level topography of lands crossed by the proposed pipelines, ditches have been dug to drain low areas and accept rain and tile drained water. The ditches are assumed to be usually dry with scattered shallow pockets of trapped water. However, it is expected that the ditches have water flowing during rainfall events and during the spring runoff. There are numerous surface drainage ways in the study area that are regulated by the St Clair Region Conservation Authority (SCRCA) (**Appendix A, Figure 4**). As discussed in **Section 3.4.3**, the preferred route minimizes the total number of crossings to the extent possible. The preferred route crosses regulated lands in three locations. Under the SCRCA regulation the surface ditches are covered within the ‘Development, Interference with Wetlands and Alterations to Shorelines and Watercourses’ Regulation passed pursuant to Section 28 of the Conservation Authorities Act, R.S.O. 1990, Ch. 27. That Regulation prohibits the placement or dumping of fill, construction of a building or structure in the floodplain or alteration to a watercourse without prior written approval of that Authority. SCRCA permits are required for these regulated areas. When regulated lands are crossed during pipeline construction, the potential exists for impacts to occur to the feature.

Water quality may potentially be affected during construction of the pipelines as a result of:

- Open cutting a drain;
- A frac-out of drilling mud during a HDD;
- Erosion or sediment release due to inappropriate dewatering techniques;
- Removal of stabilizing vegetative cover; and,
- Accidental spills due to inappropriate handling or storage of fuel, dust suppressants, lubricants or other potential contaminants and from construction vehicles working in or adjacent to the ditch.

Mitigative/Protective Measures

If there is no flow in a ditch at the time of construction, it will be dry, open cut and rehabilitated during one day. If it is flowing at the time of construction, the drain will be sealed by an acceptable method such as with steel plates, the construction area will be drained and the ditch will be open cut. Working in the dry will effectively minimize the potential for water quality issues downstream.

Pumping water can increase the potential for erosion and sedimentation. To minimize the potential for impact to surficial watercourses, the release of pumped water should be done with appropriately sized filter bags or vegetative buffers used to removed sediment from the water prior to flowing through a vegetated area.

Lands should be rehabilitated as construction is completed. Disturbed slopes should be stabilized and re-vegetated as soon as practicable to avoid erosion.

Fuelling and lubrication of construction equipment should be carried out in a manner that minimizes the possibility of spills. On-site fuel tanks and generators should be situated in a designated area that has been bermed and lined with an impermeable barrier. Refueling activities should be monitored at all times; vehicles should never be left unattended while being refueled. All containers, hoses and nozzles should be free of leaks. All fuel nozzles should be equipped with functional automatic shut-offs. Fuel remaining in hoses should be returned to the fuel storage facility. Appropriate spill management equipment must be readily available and maintained within the refueling area.

All spills that are determined to have an impact upon the environment must be reported to the MOE Spills Action Centre at 1-800-268-6060.

5.3.3 Hydrostatic Testing/Trench Dewatering

Potential Impacts

To conduct the hydrostatic test, all new pipe sections will be filled with water and pressurized to the specified hydrostatic testing procedure to ensure that the construction is sound. The pipeline for this project does not traverse any natural source capable of providing this volume of water, it will be hauled or pumped from either a natural or municipal source to a designated filling station. The nearest natural source of water capable of supplying the required volume is the St. Clair River. The nearest municipal source is at the Village of Corunna. A Permit to Take Water will be required from the Ontario Ministry of Environment should the volume withdrawn from a natural source exceed 50,000 L/day. The discharge of hydrostatic test water into natural bodies of water has the potential to impact domestic and agricultural downstream users, as well as fish, aquatic and waterfowl habitats. Uncontrolled discharge of dewatering flows from the hydrostatic test could cause downstream flooding, erosion or sedimentation. Where trenches encounter a high water table, dewatering may be necessary.

Mitigative/Protective Measures

To reduce the potential for erosion and scouring at dewatering points, appropriate and effective energy dissipation techniques should be utilized. At all dewatering points, discharge piping should be free of leaks and should be properly anchored to prevent bouncing or snaking during surging. Discharge should be monitored to ensure no erosion or flooding occurs. Protective measures may include dewatering at low velocities, dissipating water energy by discharging into a filter bag or equivalent, and utilizing protective riprap or equivalent. If energy dissipation measures are found to be inadequate, the rate of dewatering should be reduced or dewatering discontinued until satisfactory mitigative measures are in place. Dewatering points should be located downstream of municipal water intakes, or upstream of municipal water intakes at a distance approved by regulatory authorities. During water taking from a natural water source, water intakes should be screened to minimize intake of debris and organisms.

To assess the potential for introduction of contaminated water to soils or bodies of water, risk assessment testing of discharge water should be considered. Testing requirements can be influenced by the nature and quality of the source water used, any additives to the test water, the nature of the pipeline and pipeline contents, and the potential for trench water to be contaminated. Union Gas should consult with contamination experts to determine what testing, if any, is necessary for the discharged water.

Gas powered water pumps used for testing should be protected against the potential for a spill of fuel or lubrication oil. A technique that may be suitable for this is to contain the equipment within a berm underlain by an impermeable plastic that is designed to contain any potential fuel spill or leak.

A plan for a suitable dissipation location of the test water should be confirmed prior to dewatering the lines.

Net Effects

With the implementation of the mitigation measures discussed, no net effects are anticipated to result of hydrostatic testing or trench dewatering.

5.3.4 Groundwater

Potential Impacts

There are approximately 20 homes within the study area. While many of these rural dwellings have MOE records of drilled water wells for domestic and agricultural purposes, it is understood that most houses are serviced by piped municipal water sources. The MOE water well logs report that there are water wells in the study area. The average static level of these wells is approximately 9.8 m below the surface.

Standard pipeline construction practices involve standard excavation down to approximately 2 m with deeper excavations to perhaps 4m at facility crossing locations. It would be an extreme situation when a 9.0 m excavation would occur. Therefore, during construction and operation of the proposed pipelines the water table is not expected to be breached. No impact to groundwater is anticipated during the construction or operation of the proposed pipelines.

Mitigative/Protective Measures

The MOE has no standard policy for the assessment of water wells proximal to natural gas developments. Union Gas may implement a Water Well Monitoring program if wells are identified that are potentially affected by the proposed work. Water Well Monitoring helps to identify the causes of any change in well water or well performance to be determined if there are complaints about water quality or quantity. If deemed necessary by Union Gas, prior to construction, an independent hydrogeologist will review local hydrological conditions, and determine the need for monitoring of the wells close to the development.

Net Effects

With the effective implementation of the above mitigation and protective measures, no significant adverse residual effects on surface or groundwater are anticipated.

5.4 TERRESTRIAL FEATURES

Potential effects, mitigation and net effects to terrestrial features identified in published information are discussed in this section. Terrestrial features may include plants, amphibians, reptiles and birds. Further, to identify site specific presence or absence of species at risk or their habitats along the preferred route, field studies are recommended.

Recommended Field Studies, depending on the final detailed design of the pipeline potentially include:

- Ecological Land Classification
- One or two-season botanical survey
- Wildlife habitat assessment
- Snake cover board surveys
- Breeding bird surveys (woodland, grassland)
- Amphibian breeding surveys (woodland, wetland)
- Waterfowl stopover and staging-Tundra Swan.

5.4.1 Designated Natural Areas

Potential Effects

As stated in **Section 2.1**, there are Significant Natural Areas designated in the Lambton County OP. The closest Significant Natural Area to the study area is the Bickford Oak Woods Wetland Complex. The next closest Significant Natural Area to the study area is the Burton Drain Woodlot (**Appendix A, Figure 5**). Bickford woods Wetland is approximately 2.4 km away from the study area.

Due to the relatively shallow nature of pipeline construction and the distance of separation between these features and the study area, no potential effects or net effects are anticipated. Therefore, mitigation measures have not been developed to protect designated natural areas.

5.4.2 Wildlife and Wildlife Habitat

Potential Effects

Due to the presence of woodlots, watercourses, and fence lines in close proximity to the preferred route, opportunities for bird, mammal, reptile or amphibian habitat exists. Field surveys will be completed prior to construction to confirm the presence or absence of wildlife and wildlife habitat.

Potential effects on wildlife and wildlife habitat from construction include direct mortality from construction vehicles, habitat destruction through vegetation removal, habitat degradation through spills and sensory disturbance of wildlife during construction.

Mitigation and Protective Measures

Mitigation and protective measures are discussed in **Section 5.3** for vegetation removal, and accidental spills. Environmental mitigation and protective measures during construction include the following:

- Clearing activities requiring the removal of trees or shrubs should be avoided during the migratory bird nesting period (May 1 to July 31); if clearing is necessary during this period, clearance should be obtained from a licensed ornithologist. If a nest is located, a designated setback will be marked off in which no clearing or construction activities will be allowed while the nest is active. The radius of the setback width ranges from 5- 60 m depending on the species. Setback widths are based on the species' sensitivity and on setback width recommendations that have been reviewed and approved by Environment Canada.
- Speed limits should be lowered along the construction right-of-way where field investigations identify specific wildlife concerns
- Trench operations should be followed as closely as practical with backfill operations, to facilitate the movement of wildlife across the trench
- Gaps in stockpiles should be created to allow for the potential movement of wildlife across the right-of-way
- Fencing should be erected around deep excavations such as bore bays to prevent wildlife entrapment
- Garbage, particularly food wastes, should be properly disposed of to avoid attracting wildlife
- Construction, clean-up and restoration activities should be conducted expeditiously to minimize potential barriers and hazards to wildlife
- The contractor should ensure that crews do not threaten, harass or injure any wildlife.

- If any terrestrial wildlife are encountered during construction, personnel are required to move a safe distance away from the animal and wait for the animal to move off the construction site
- Equipment and vehicles are to yield the right-of-way to wildlife
- Any wildlife and wildlife habitat identified through the field surveys will be reported to the MNR to determine the necessity for additional site-specific mitigation measures
- Project-related wildlife deaths, nuisance animals and/or species encountered that may be unusual or identified as potential species at risk should be immediately reported to Union Gas's on-site inspection team, who will report as necessary to the MNR and work with the Ministry to determine the necessity for additional site-specific mitigation measures.

If the recommended field studies identify the presence of a species to be protected, mitigation measures will be developed to help ensure that impacts are removed or minimized to the extent possible.

Net Effects

With the effective implementation of the above mitigation and protective measures and any developed for identified species, no significant adverse residual effects to wildlife and wildlife habitat are anticipated.

5.4.3 Vegetative Species and habitats

Potential Effects

Pipeline construction has the potential to disturb rare vegetative species if any are located on the construction RoW.

Mitigation and Protective Measures

To determine the plant communities along the pipeline RoW, an Ecological Land Classification is recommended. This will help identify if there are communities present which require mitigation.

Net Effects

With the effective implementation of mitigation and protective measures, no significant adverse residual effects to wildlife and wildlife habitat are anticipated.

5.5 SOCIO-ECONOMIC ENVIRONMENT

5.5.1 Residents and Businesses

Potential Effects

The preferred route is sited in a rural agricultural landscape which also contains industrial processing plants. There are agricultural fields and operations along the preferred route. Discussion on protecting agricultural soils is discussed in **Section 5.2.3**. There are approximately seven residences on the Preferred Route. During pipeline construction residents may experience a temporary disruption in the use and enjoyment of their property, and in the use of local roads. Farm operations may experience temporary access interruptions. Noise will be generated by the operation of equipment and associated vehicular traffic, in addition to dust and equipment exhaust. Construction activities will temporarily affect the aesthetic landscape of the construction area. Potential safety concerns also exist at locations where residents and vehicles come in proximity to construction activities.

Mitigation and Protective Measures

To create a communication avenue with all affected parties, Union Gas has dedicated a Lands Representative to the project. This role can serve as a mechanism to track and resolve discussion items.

Motorized construction equipment should be equipped with mufflers and/or silencers as available to avoid unnecessary noise at the construction sites. Company and construction personnel should avoid idling of vehicles; vehicles or equipment should be turned off when not in use unless required for effective operation of the vehicle or equipment. To the greatest extent possible activities that could create noise should be restricted to daylight hours. Sources of continuous noise, such as portable generators, should be shielded as appropriate or located so as to minimize disturbance to local residents. Union Gas should consult with officials of St. Clair Township to ensure noise bylaw conformity.

The Construction Contractor should implement good site practices during construction in line with the Environment Canada document 'Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities', which may include:

- Maintaining equipment in good running condition and in compliance with regulatory requirements;
- Protecting stockpiles of friable material with a barrier or windscreen in the event of dry conditions and excessive dust;
- Dust suppression (e.g. water) of source areas; and,
- Covering loads of friable materials during transport.

Watering for dust control must not result in the formation of puddles, rutting by equipment or vehicles, the tracking of mud onto Rokeby Line.

With the effective implementation of the above mitigation and protective measures, no significant adverse residual effects on residents or businesses are anticipated.

Access to residences, farms and industrial sites will be maintained and kept open to facilitate the entering and exiting needs and desires of those involved.

Net Effects

Net effects to residences and businesses are anticipated to be limited to temporary noise and access issues.

5.5.2 Economy & Employment

Potential Effects

The construction and operation of the proposed project will result in direct and indirect business income, direct and indirect employment income, and an increase in tax revenues.

Mitigation and Protective Measures

Union Gas should make all reasonable efforts to procure services and materials from local suppliers, where services or products are available in sufficient quantity and at competitive prices.

Net Effects

With the effective implementation of the Project and local procurement, positive residual effects on the economy and employment are anticipated.

5.5.3 Contaminated Sites

Potential Effects

There are no potentially contaminated sites identified in the study area and the preferred route does not cross lands identified as contaminated. Since there are roadways and a significant petrochemical industry in the study area the potential to encounter contamination exists.

Mitigation and Protective Measures

If contaminated soils or suspected contaminated soils are encountered during the construction or operation of the proposed pipeline, action will be taken to identify and remove the contaminant in consultation with the MOE.

Net Effects

With the effective implementation of the above mitigation and protective measures, no significant adverse residual effects from contaminated sites are anticipated.

5.5.4 Waste Management

Potential Effects

Improper disposal of waste material generated during construction may result in contamination to soil, groundwater, and/or surface water resources on and off the construction right-of-way. Litter generated during construction may also become a nuisance to adjacent properties if not appropriately contained.

Mitigation and Protective Measures

During construction, the construction contractor should implement a site-specific waste collection and disposal management plan, which may include site practices such as:

- All waste materials and recycling transported off-site
- Contractors required to remove their excess materials from the site
- Labelling and proper storage of hazardous and liquid wastes in a secure area that would ensure containment of the material in the event of a spill
- Implementation of an on-going waste management program consisting of reduction, reuse, and recycling of materials
- Disposal of sanitary wastes would be the responsibility of a contracted third party that would ensure disposal in accordance with appropriate provincial legislation, standards and policies

Net Effects

With the effective implementation of the above mitigation and protective measures, no significant adverse residual effects from waste management are anticipated.

5.5.5 Land Use

Potential Effects

The study area is located on lands designated municipally as 'Petrochemical Industrial Lands' (Lambton County, 1998). The study area contains agricultural land, industrial facilities, maintained lawns, cultural vegetation communities and natural (forest, marsh) vegetation communities (**Appendix A, Figure 1-6**).

Potential effects on cultural and natural vegetation communities are discussed in **Section 5.4.1**. Potential effects on agricultural soil capability are discussed in **Section 5.2.3** and further elaborated herein. Background data indicates that the agricultural land may contain tile drainage infrastructure. Where equipment is moving from one agricultural field to another, there is the potential for the spread of SCN to previously uncontaminated fields. Once a field has been infested there is significant potential for soybean crop loss and there is no effective method of eradication.

Mitigation and Protective Measures

Union Gas should undertake consultation with the landowner of the agricultural field to determine whether systematic tile drainage is present.

If drainage is present, Union Gas should undertake standard mitigation during trenching, including:

- The construction contractor would install header tile to maintain tile system function;
- The pipeline trench would be excavated to a depth that would allow adequate clearance between the top of the pipeline and the bottom of any existing drainage system;
- Tile drains severed or crushed would be recorded and flagged;
- If a main drain, header drain, or large diameter drain is severed, a temporary repair would be made to maintain field drainage and prevent flooding of the work area and adjacent lands;
- The downstream side of severed drains that cross the trench would be capped to prevent the entry of soil, debris and/or rodents;
- Damaged and severed drains would be repaired following construction; and,
- After repair and prior to backfilling, the landowner would be invited to inspect and approve the repair.

To identify the properties already containing SCN, a pre-construction soil sampling program is recommended to be implemented. Properties tested should include the potentially effected agricultural fields, subject to landowner approval. Field surveys should be conducted when field conditions are dry. If SCN impacted areas are discovered, a plan should be completed which will outline mitigation measures such as the use of machine washing stations, restricted access to impacted lands and a topsoil preservation plan.

Net Effects

With the effective implementation of the above mitigation and protective measures, no significant adverse residual effects on land use are anticipated.

5.5.6 Cultural Heritage Resources

Potential Effects

To assess the potential for effects to built and cultural heritage resources by constructing and operating the proposed pipeline a Built and Cultural Heritage Overview was prepared, **Appendix C**. There are properties identified in the study area as having cultural heritage resources (built heritage and/or cultural heritage landscapes). The preferred route avoids the identified properties.

Mitigation and Protective Measures

Prior to construction, archaeological assessments of the planned construction work areas should be completed and submitted to MTCS for their review and comment.

Net Effects

With the effective implementation of the above mitigation and protective measures, no significant adverse residual effects on cultural heritage resources are anticipated.

5.5.7 First Nations and Métis Nation Interests and Archaeology

Potential Effects

The project is not located on a First Nations community and no impact to traditional territory of First Nations or Métis Nation is anticipated.

Local First Nations and Métis Nation were notified of the project, the Information Session and were asked for input towards identifying their interest in the project. No response was received at the time of writing this report.

Mitigation and Protective Measures

Mitigation and protective measures for archaeology are discussed in **Section 5.5.6**.

Net Effects

No net effects to First Nations and Métis Nation or archaeology are anticipated to result from this project.

5.5.8 Infrastructure

Potential Effects

Potential exists for damage to pipelines and other utilities due to accidental encounter during trench excavation.

Mitigation and Protective Measures

The Construction Contractor will be responsible for locating and exposing all existing pipelines and utilities on lands which may be impacted by trench excavation.

With the effective implementation of the above mitigation and protective measures, no significant adverse residual effects on infrastructure are anticipated.

Net Effects

No net effects to existing infrastructure are anticipated by the construction and operation of this proposed pipeline construction project.

6.0 Cumulative Effects Assessment

The recognition of cumulative effects assessment as a best practice is reflected in many regulatory and guidance documents. With regard to development of hydrocarbon pipelines in Ontario, the *OEB Environmental Guidelines (2011)* note that cumulative effects of pipeline construction should be identified and discussed in the ER as an integral part of the assessment. The cumulative effects assessment refers to effects associated with construction and operation of the Project.

Building upon the intent of the *OEB Environmental Guidelines (2011)*, the OEB has specified that only those effects that are additive or interact with the effects that have already been identified as resulting from the Project are to be considered under cumulative effects. In such cases, it will be necessary to determine whether these effects warrant mitigation measures such as alterations in routing, timing of construction or other measures that can address the cumulative effects. The cumulative effects assessment has been prepared with consideration of this direction from the OEB.

6.1 METHODOLOGY

This assessment describes the potential cumulative effects resulting from the interaction of residual effects of construction and operation with the effects of other unrelated projects. The other projects assessed are those that are either existing or approved and that have a high likelihood of proceeding.

Cumulative effects include the temporal and spatial accumulations of change that occur in an area or system due to past, present, and future activities. Change can accumulate in systems by either an additive (i.e. cumulative) or interactive (i.e. synergistic) manner. By applying the principles of avoidance, minimization, and compensation to limit project-specific effects, potential adverse residual effects on environmental and socio-economic features have been greatly minimized prior to accounting for the effects of other unrelated projects. Positive residual effects, such as an increase in employment or in property taxes, have not been assessed in the cumulative effects assessment.

Specifically, the cumulative effects assessment methodology is designed to evaluate and manage the additive and interactive effects from the following sources:

- Existing infrastructure, facilities, and activities as determined from available data sets;
- The proposed Project; and,
- Future activities where the undertaking will proceed, or has a high probability of proceeding.

Although rare in occurrence, it is plausible that accidents or emergency events may arise due to an unforeseen chain of events during the Project's construction or operational life. As a result of the rarity and magnitude of such events, they have not been assessed here, as they are extreme in nature when compared to the effects of normal construction and operation activities, and require separate response plans. Project decommissioning and abandonment is another event that is beyond the temporal boundaries of the cumulative effects assessment and therefore has not been assessed.

6.2 STUDY BOUNDARIES

Spatial

To make conservative assumptions about the magnitude and probability of possible effects, a 100 m boundary around the study area was used for the cumulative effects assessment.

Temporal

The temporal boundaries for the cumulative effects assessment reflect the nature and timing of Project activities, and the availability of information surrounding future projects with a high probability of proceeding. The Project schedule identifies three key milestone activities:

- ER and technical design – 2014;
- Construction – 2015; and,
- Operation - 2015 through 2065*.

**Fifty years of pipeline operation is used as an assumption, although the pipelines may be operational beyond fifty years.*

Based upon these milestone activities, two time periods were selected for evaluation: 2015 and 2020. The year 2015 was selected to represent the construction period, and the year 2020 was selected to represent the operation and maintenance period. Forecasting beyond 2020 increases the uncertainty in predicting whether projects will proceed, and the effects associated with these projects.

6.3 ANALYSIS OF CUMULATIVE EFFECTS

Sections 5.2-5.5 of this ER consider the potential effects of the Project on specific features and conditions, and propose mitigation and protective measures to obviate or reduce the potential effects. The cumulative effects assessment evaluates the significance of residual effects (after mitigation) of the Project along with the effects of other unrelated projects.

Project consultation with Agencies, Landowners, First Nations and MNO peoples has included requests to identify potential cumulative effects with the proposed Project.

To-date, agencies contacted have not identified any proposed undertakings which may contribute to cumulative effects. Given the industrial setting in which the project occurs it is assumed that industrial development will be an on-going activity.

Year 2015: Construction

The only anticipated projects that will overlap in time with project construction are other industrial developments on surrounding lands.

Residual project effects which may occur during project construction are outlined in **Sections 5.2-5.5**. To consider the additive and interactive effects at their maximum intensity, the cumulative effects assessment assumes that construction activities for surrounding industrial development and the project will occur concurrently. Cumulative project effects that could occur include accidental spills, erosion and/or sedimentation, wildlife and wildlife habitat disturbance, and nuisance disturbances of noise, dust, and air quality.

Mitigation and protective measures for spills are outlined in **Section 5.2, 5.3, and 8.2.3**, and erosion and sedimentation in **Section 5.3 and 8.2.2**. Provided that surrounding industrial development activities implement similar appropriate mitigation and protective measures, the probability of such events occurring concurrently is low and the magnitude of such an event would be low. As such, any adverse residual effects on the natural environment are not anticipated to be significant.

Potential residual effects on wildlife and wildlife habitat associated with construction of the project are accidental direct mortality and sensory disturbance. In the event of project-related wildlife deaths, the MNR will be contacted. Should mortality occur between concurrent projects for similar species, the Ministry will be able to note the occurrences and coordinate with Union Gas to adjust construction activities as appropriate. Potential cumulative effects due to sensory disturbance are discussed below. Provided that the above measures are undertaken, adverse cumulative effects to wildlife and wildlife habitat will be of low probability and will be mitigated as coordinated through the MNR, and therefore are not anticipated to be significant.

As construction of the project and nearby development will cause noise, cumulative effects may occur. Provided that industrial development activities follow noise reduction practices similar to those outlined in this Report, cumulative effects will be of short duration, low magnitude, and reversible. Therefore adverse residual cumulative effects on the acoustic environment are not anticipated to be significant.

Potential residual effects on air quality associated with construction of the project are an increase in air pollutants from operation of vehicles and equipment, and an increase in dust from construction activities. It is expected that industrial development activities will also lead to a temporary increase in pollutants and dust. Provided that mitigation measures outlined in this Report are properly implemented, cumulative effects will be of short duration, low magnitude, and reversible. Therefore adverse residual cumulative effects on air quality are not anticipated to be significant.

Year 2020: Operation and Maintenance

Operation and maintenance activities for the project will occur on industrial land where numerous companies operate and maintain pipeline facilities. As existing infrastructure requires maintenance activities, any nuisance impacts from operation and maintenance activities for the project are anticipated to be of minimal impact and not significant.

6.4 SUMMARY

The potential cumulative effects of the project were assessed by considering industrial development that may commence during construction, or that may commence sometime in the future. A 100 m boundary around the study area was used to assess the potential for additive and interactive effects of the project and other developments on environmental and socio-economic features. The cumulative effects assessment determined that, provided the mitigation and protective measures outlined for this project are implemented, potential cumulative effects will be of low probability and magnitude, short duration, and reversible, and were therefore not anticipated to be significant.

7.0 Supplemental Studies

No environmental field investigations were completed as part of the ER. The environmental and socio-economic setting data compiled from secondary source maps, reports and data sources, consultation and engagement, roadside and aerial reconnaissance, and aerial photograph interpretation was considered adequate for selecting a preferred route, identifying effects and developing mitigation and protective measures.

There are instances where field investigations along the preferred route prior to construction are recommended in **Section 5.0**. These supplemental studies are not expected to change the significance conclusions identified in the ER. Supplemental studies will be necessary for watercourse crossings, vascular plants and vegetation communities, wildlife and wildlife habitat, archaeological heritage resources, and agriculture.

7.1 ENVIRONMENTAL STUDIES

7.1.1 Watercourse Crossings

As noted in **Section 5.3**, the Preferred Route should undergo a field investigation to verify the number of watercourse crossings and watercourse and aquatic characteristics. This information will be used to determine the construction window (as determined by the MNR) and appropriate watercourse-crossing technique. After a detailed design is produced a Fisheries and Oceans Canada Self-Assessment will be completed to determine the level of risk of causing a "Serious Harm" as defined by the *Fisheries Act*. The results of this assessment will determine if additional permitting (Authorisation) under the *Fisheries Act* is required.

7.1.2 Vascular Plants and Vegetation Communities

As noted in **Section 5.4.3**, the preferred route will undergo field surveys to confirm the presence or absence of plant species of concern and species at risk, and rare vegetation communities. Field survey results will be used to determine any site-specific construction methods and mitigation. If tree removal is required, an arborist will also conduct a survey of areas, to develop a tree preservation and compensation plan.

7.1.3 Wildlife and Wildlife Habitat

As noted in **Section 5.4.2**, the preferred route will undergo field surveys to construction to confirm habitat suitability for species of conservation concern and species at risk. Where suitable habitat is present, species-specific surveys will be conducted. Field survey results will be used to determine any site-specific construction methods and mitigation, and to determine permitting requirements in consultation with the MNR.

7.2 SOCIO-ECONOMIC STUDIES

7.2.1 Archaeology and Heritage

As noted in **Section 5.5.6**, archaeological assessments will be required along the preferred route to determine impacts to archaeological resources. In certain locations the archaeological assessment may need to be coordinated with the MNR to ensure no impacts occur to species of conservation concern and/or species at risk occur. In addition, prior to construction of any above-ground facilities, a heritage assessment will be required to be completed and submitted to MTCS for their review and comment.

7.2.2 Agriculture

As noted in **Section 5.2.3 and 5.5.5**, upon landowner consent soil sampling will be completed for each agricultural row crop field crossed by the Preferred Route, to determine the extent of occurrence of the soybean cyst nematode (SCN). Prior to construction a drainage contractor will also be retained to verify the type and location of drainage tiles where possible. Future plans for improvements to agricultural drainage will also be identified.

8.0 Monitoring and Contingency Plans

8.1 MONITORING

The primary objective of compliance and effects monitoring is to ensure mitigation and protective measures are effectively implemented and to measure the effects of activities associated with construction on environmental and socio-economic features. Ultimately, the knowledge gained from monitoring is used to avoid or minimize issues which may arise during subsequent construction projects.

Previous pipeline construction experience, and a review of post-construction monitoring reports from other projects, indicates that effects from pipeline construction are for the most part temporary. The mitigation and protective measures to reduce and obviate effects are well known and have been shown to be effective. With this in mind, Union Gas should adhere to the following general monitoring practices:

- Trained staff should be on-site to monitor construction and should be responsible for ensuring that the mitigation and protective measures and monitoring requirements within the ER are executed effectively. Union Gas should implement an orientation program for inspectors and contractor staff to provide information regarding Union Gas' environmental program and commitments, as well as safety measures
- Where appropriate, the recommendations made in the ER should be incorporated into the contract specifications
- Contact between landowners and the company liaison should be maintained to ensure that the concerns of landowners are quickly addressed
- An inspection of the route should be conducted approximately one year after construction to determine whether any areas require further rehabilitation

The following sections list specific environmental monitoring activities recommended for the Project.

8.1.1 Exposed Soils

Where soils are exposed for construction activities, potential effects may include surface soil erosion, trench slumping, and sedimentation of watercourses. The movement of heavy machinery on wet soil may cause rutting, compaction, and mixing of topsoil and subsoil. Improperly salvaged topsoil can result in topsoil and subsoil mixing, compaction, rutting and erosion, which can potentially decrease crop yields. Improper water discharge can lead to erosion and sedimentation. High winds have the potential to erode soil stockpiles. Monitoring of potential impacts to exposed soils should occur as outlined in **Sections 5.2.2.**

8.1.2 Watercourse Crossings

Watercourse crossings have the potential to effect fish, fish habitat and water quality. Appropriate staff from Union Gas' on-site inspection team should be on-site during all watercourse crossings as outlined in **Section 5.3.1 and 5.3.2**.

8.1.3 Groundwater

Prior to construction, an independent hydrogeologist should review local hydrological conditions to determine the need for water wells to be monitored and develop a well monitoring program, as outlined in **Section 5.3.4**.

8.1.4 Vegetation

One year following construction, any planted vegetation should be inspected for survival; in areas of severe dieback or in areas important to environmental functions (e.g. riparian or slope cover), dead and diseased vegetation should be replaced. Planted trees on private land should be guaranteed for a period of one year following planting, provided the landowner maintains the trees as appropriate after planting.

8.1.5 Wildlife

Should wildlife and wildlife habitat field surveys identify Species at Risk, appropriate mitigation measures will be determined and implemented as required.

8.1.6 Landowner and Community Relations Program

Social effects of the Project on landowners, businesses and the community, and recommended mitigation and protective measures, are outlined in **Section 5.5**. All social effects will be monitored through a communications program. As part of this communication, all residents and absentee landowners affected by construction will be notified in advance of construction activities in their area, as appropriate. The notification will provide the contact information for a designated Union Gas representative.

A complaint tracking system will also be implemented. A Union Gas representative will prepare a report detailing the time and date of any call, the nature of the concern, the corrective action taken where appropriate, and the time and date of follow-up contact. The Project Manager will also establish contact with local municipalities indicating the nature of the work to be undertaken and plans for traffic management plans.

Following completion of construction, Union Gas will contact all residents along the easement to continue ongoing communications where necessary. During the first two years, particular attention will be paid to monitoring and documenting any effects associated with construction of the pipeline.

8.1.7 Municipal Roads

Municipal roads affected by pipeline construction should be restored to their pre-construction condition in consultation with municipal engineers. Road Superintendents should be given an opportunity to inspect any repairs or modifications. For a period of one year after construction (first year of operations), roads should be monitored following a heavy rain event and following spring runoff to ensure no erosion, bank slumping, road subsidence or major rutting has occurred as a result of construction activities. As appropriate, affected roadside ditches and drains would be repaired and monitored to ensure that they are functioning properly.

8.2 CONTINGENCY

Contingency planning is necessary to prevent a delayed or ineffective response to unexpected events or conditions that may occur during construction of the proposed pipeline. An essential element of contingency planning is the preparation of plans and procedures that can be activated if unexpected events occur. The absence of contingency plans may result in short or long term environmental effects and possibly threaten public safety.

Unexpected events requiring contingency planning that may occur during construction include: adverse weather, human error and the discovering of unexpected finds. Although unexpected problems are not anticipated to occur during construction, Union Gas and the pipeline contractor should be prepared to take appropriate action. Construction staff should be made aware of and know how to implement contingency measures.

8.2.1 Construction Delays

Delays in the construction schedule may result from poor field conditions generated by adverse weather. If a change in the construction schedule is necessary, contingency measures should be implemented as outlined in **Sections 5.2.3** and **5.2.5**.

8.2.2 Watercourse Sedimentation

Even with properly installed erosion and sedimentation control measures, extreme runoff events could result in collapse of silt fencing, overflow or bypass of barriers, slope or trench failures and other problems which could lead to sedimentation of watercourses. If sedimentation of a watercourse occurs, the contingency measures outlined in **Section 5.3.2** should be implemented.

8.2.3 Accidental Spills

During construction, an accidental spill of fluids may occur. Fluids may include fuels, lubricating oil and grease, and hydraulic fluids. The effect of the spill will depend upon the magnitude and extent of the spill, and the environmental and socio-economic conditions in which it takes place. Upon release of a hydrocarbon-based construction fluid, Union Gas should immediately determine the magnitude and extent of the spill, and rapidly take measures to contain it.

Release of sediment should also be treated as a potential spill depending on the magnitude and extent. All spills should be immediately reported to the Chief Inspector and Environmental Inspector. If necessary, the MOE Spills Action Center should be notified at 1-800-268-6060.

A Spills Response Plan should be developed by the Contractor, reviewed with staff, and posted in site trailers. Appropriate spill containment apparatus and absorbent materials should be available on-site, especially near water bodies or sensitive wells. Staff should be trained in the use of spill containment equipment and materials.

8.2.4 Unexpected Finds

Every reasonable effort should be made to identify cultural heritage resources along the preferred route prior to construction. However, it is possible that such resources could be encountered along the route during construction. Should previously unknown archaeological, paleontological or historical resources be uncovered or suspected of being uncovered during construction, ground disturbance in the find location should cease immediately. MTCS and an archaeologist licensed in the Province of Ontario should be notified immediately. An appropriate site-specific response plan should then be employed following further investigation of the specific find. The response plan would indicate under which conditions the ground disturbance activity in the find location may resume.

In the event that human remains are uncovered or suspected of being uncovered during ground disturbance, the above measures should be implemented along with notifying local police, the coroner's office and the Cemeteries Regulation Unit of the Ontario Ministry Consumer Services (1-800-889-9768).

In the event that previously unknown contaminated soils are uncovered or suspected of being uncovered, construction in the find location should cease immediately. In such an instance, Union Gas should retain expert advice on assessing and developing a soil sampling, handling and remediation plan.

9.0 Conclusion

The ER investigated data on the physical, aquatic, terrestrial and socio-economic environment in the study area, including the proposed Project facilities. In the opinion of Stantec the Project will have minimal potential for environmental effects as most environmentally sensitive features were avoided at the pipeline route selection stage. The recommended program of standard mitigation and protection measures are considered sufficient. Monitoring and contingency measures will ensure mitigation and protective measures have been effective in both the short and long term.

With the implementation of the recommendations in the ER, on-going communication and consultation, and adherence to related permit, regulatory and/or legislative requirements, any adverse residual environmental and/or socio-economic effects of this Project are not anticipated to be significant.

STANTEC CONSULTING LTD

Prepared by _____
(signature)

Steve Thurtell, M.Sc., Project Manager

Reviewed by _____
(signature)

David Wesenger, BES, Environmental Services Managing Leader, Senior Principal

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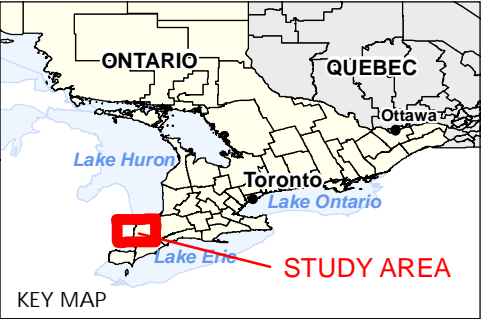
Appendix A:

Existing Conditions Figures



Legend

- Study Area
- Expressway / Highway
- Road
- Railway
- Watercourse
- Municipal Boundary
- Regional Municipal Boundary
- Waterbody

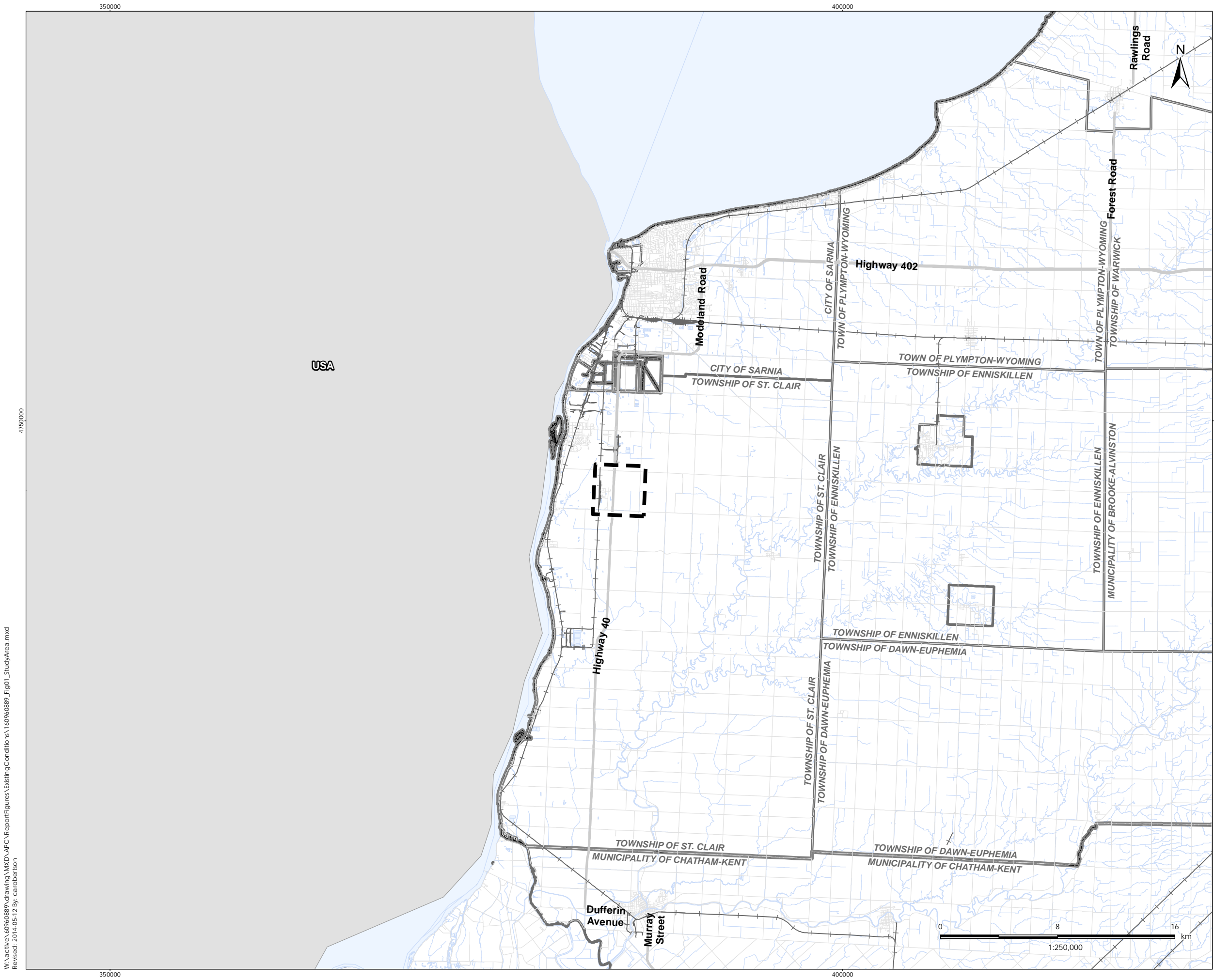


- Notes
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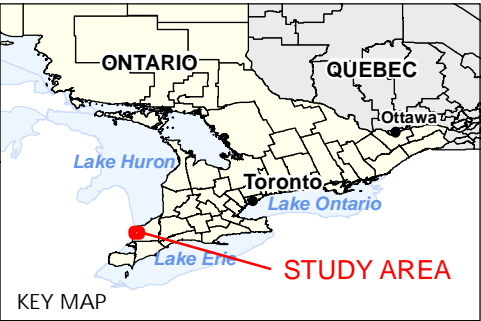
Figure No.
1
Title
Study Area





Legend

- Study Area
- Expressway / Highway
- Road
- Railway
- Watercourse
- Municipal Boundary
- Regional Municipal Boundary
- Waterbody
- Bedrock
 - Bedrock Formation Boundary
 - Bedrock covered by less than 22 feet of overburden
 - Bedrock covered by 22-34 feet of overburden
 - Bedrock covered by 34-47 feet of overburden
 - Bedrock covered by 47-61 feet of overburden
 - Bedrock covered by 61-80 feet of overburden
 - Bedrock covered by 80-124 feet of overburden
 - 5d: Glaciolacustrine-derived silty to clayey till
 - 8a: Massive-well laminated

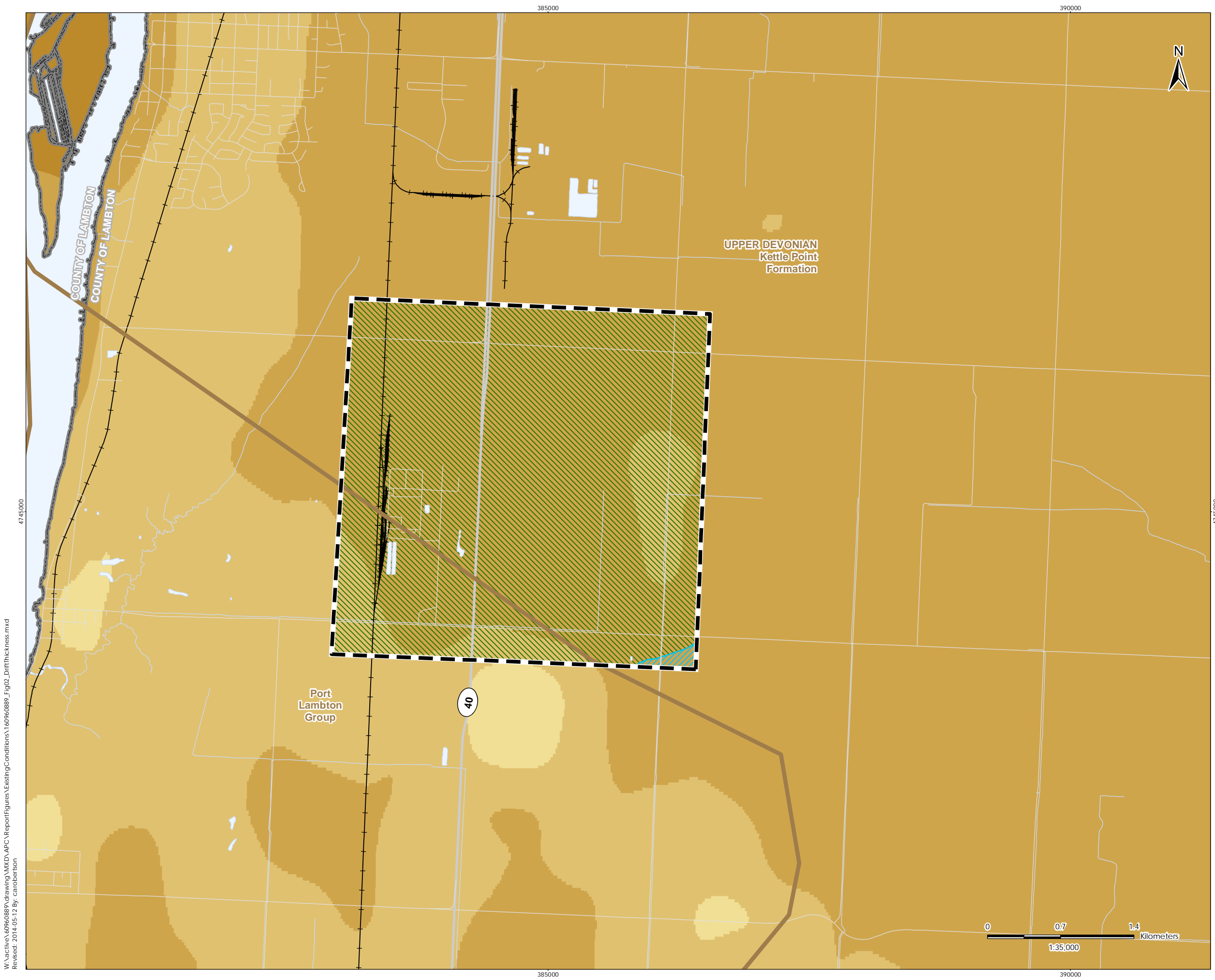


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Figure No.
2
Title
Bedrock Formation Boundaries,
Drift Thickness and Surficial Geology





Legend

- Study Area
- Expressway / Highway
- Road
- Railway
- Watercourse
- Municipal Boundary
- Regional Municipal Boundary
- Waterbody

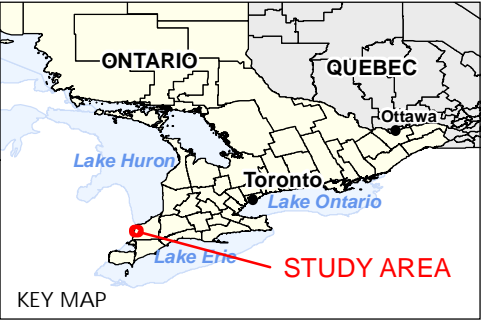
Canada Land Inventory for Agriculture

- 1 - No significant limitations in use for Crops
- 2 - Moderate limitations on use for crops
- 3 - Moderately severe limitations on use for crops.
- 4 - Severe limitations on use for crops
- 5 - Very severe limitations preclude annual cultivation; improvements feasible.

Soil Types

Drainage Type

- Systematic
- Random



Notes

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- Canada Land Inventory, National Soil DataBase, Agriculture and Agri-Food Canada, 1998.

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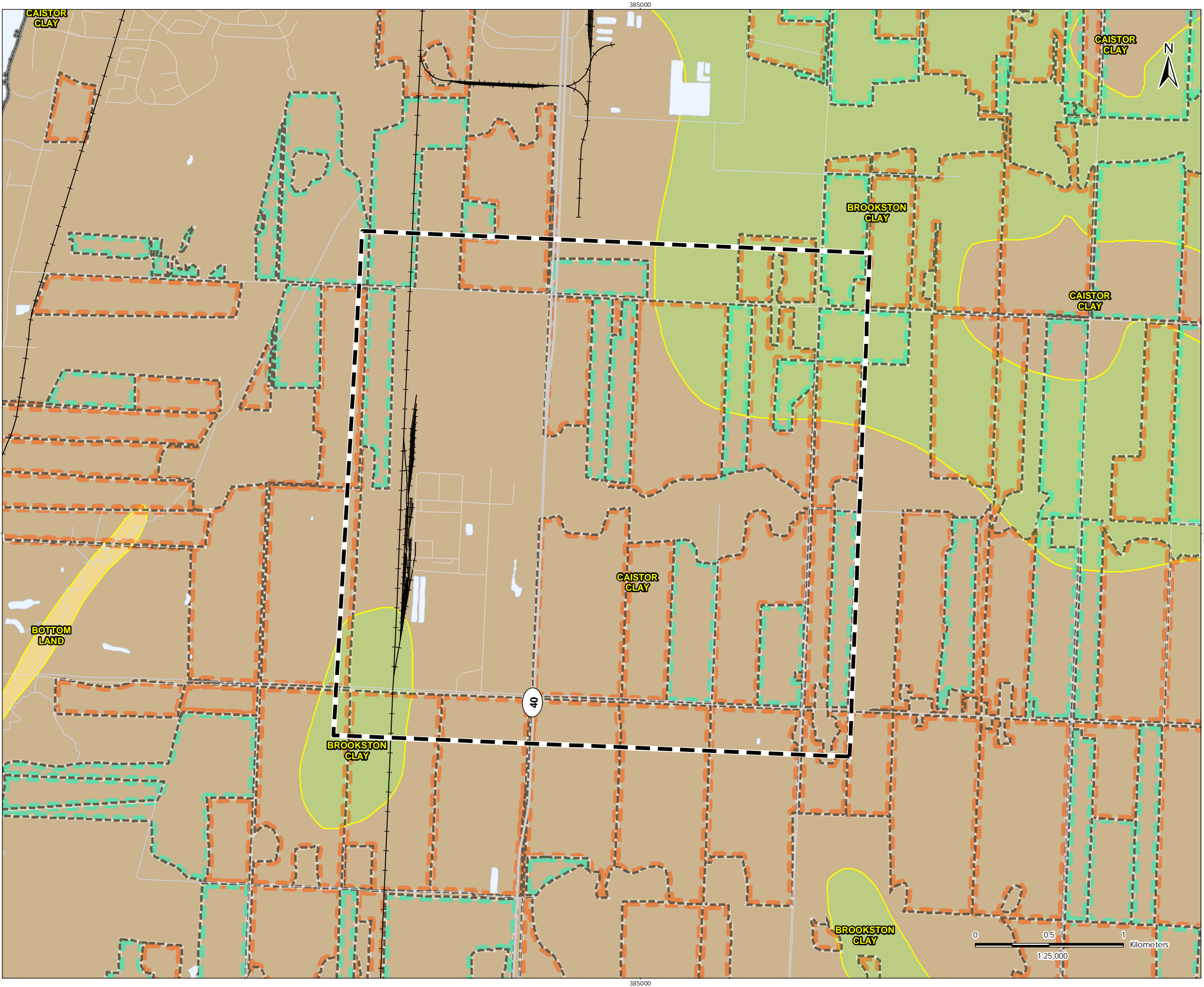
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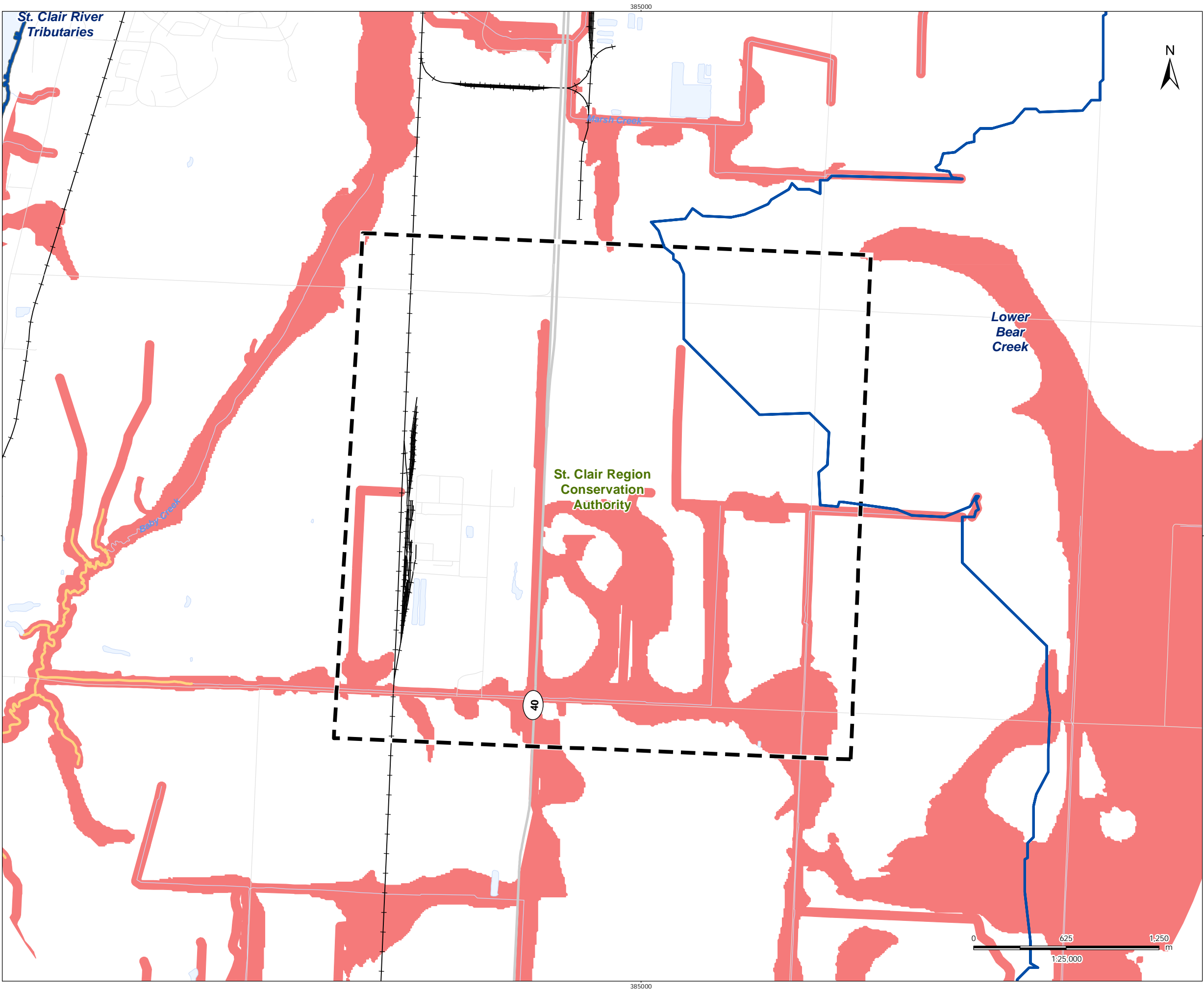
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3

Title

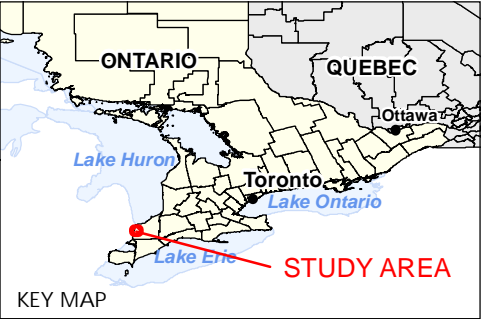
Soil Capability and
Drainage Types





Legend

- Study Area
- Expressway / Highway
- Road
- Railway
- Municipal Boundary
- Regional Municipal Boundary
- Conservation Authority Boundary
- Conservation Authority Regulation Limit
- Watershed Characteristics
- Watercourse
- Watershed Boundary
- Waterbody
- Thermal Regime
- Warm



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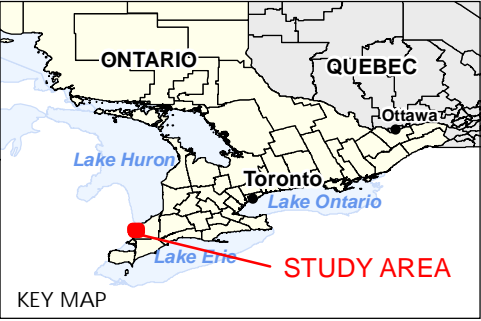
Figure No.
4

Title
Surficial Hydrology



Legend

- Study Area
- Expressway / Highway
- Road
- Railway
- Watercourse
- Regional Municipal Boundary
- Municipal Boundary
- Waterbody
- Woodland
- Wetlands**
 - Wetland, Provincially Significant

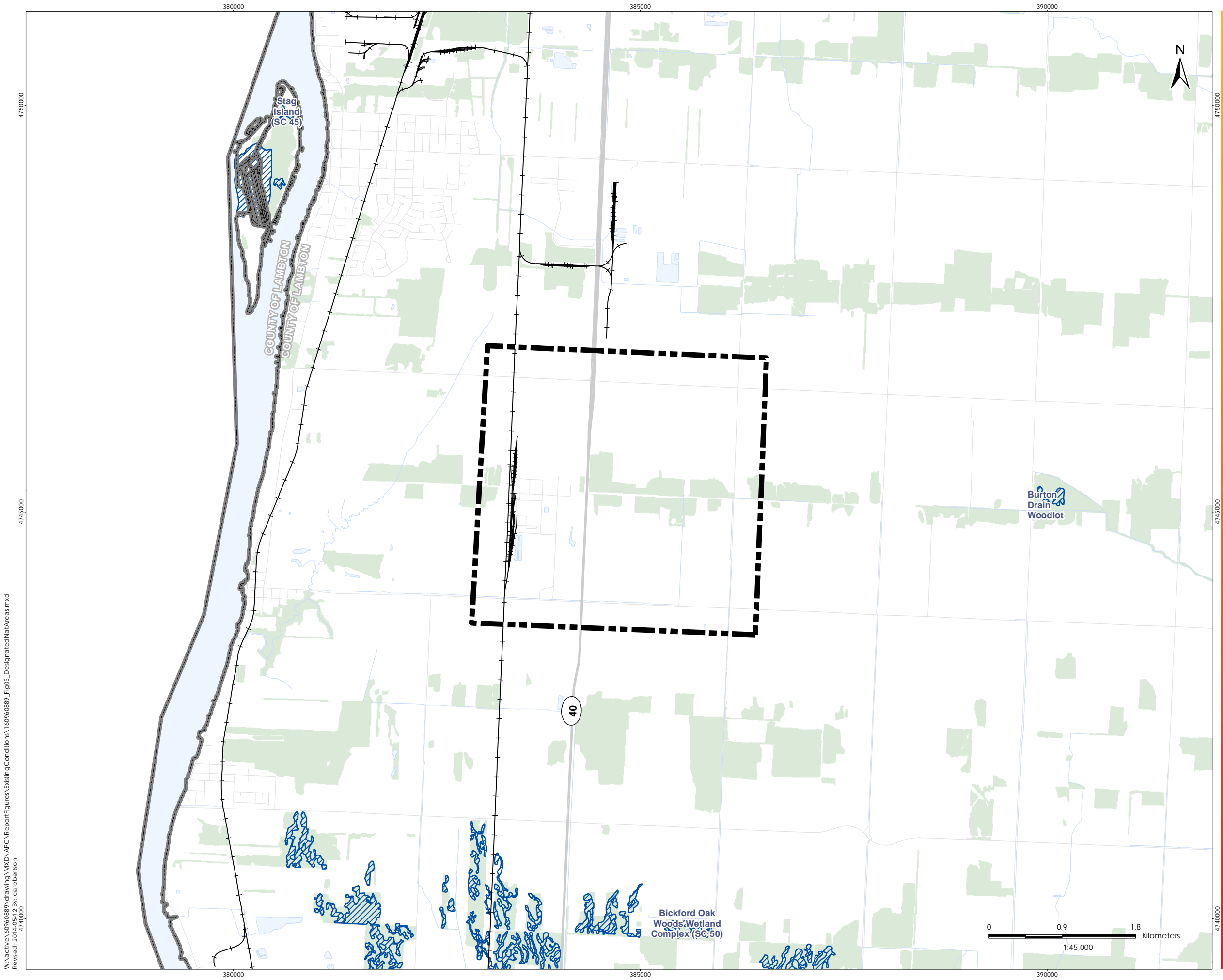


- Notes
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Figure No.
5

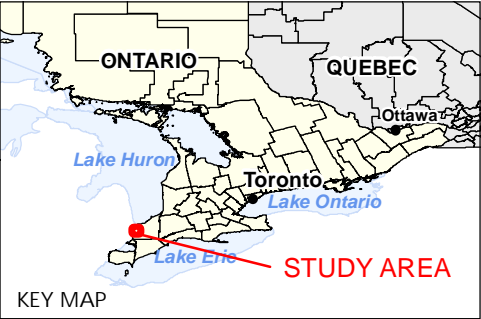
Title
Designated Natural Areas





Legend

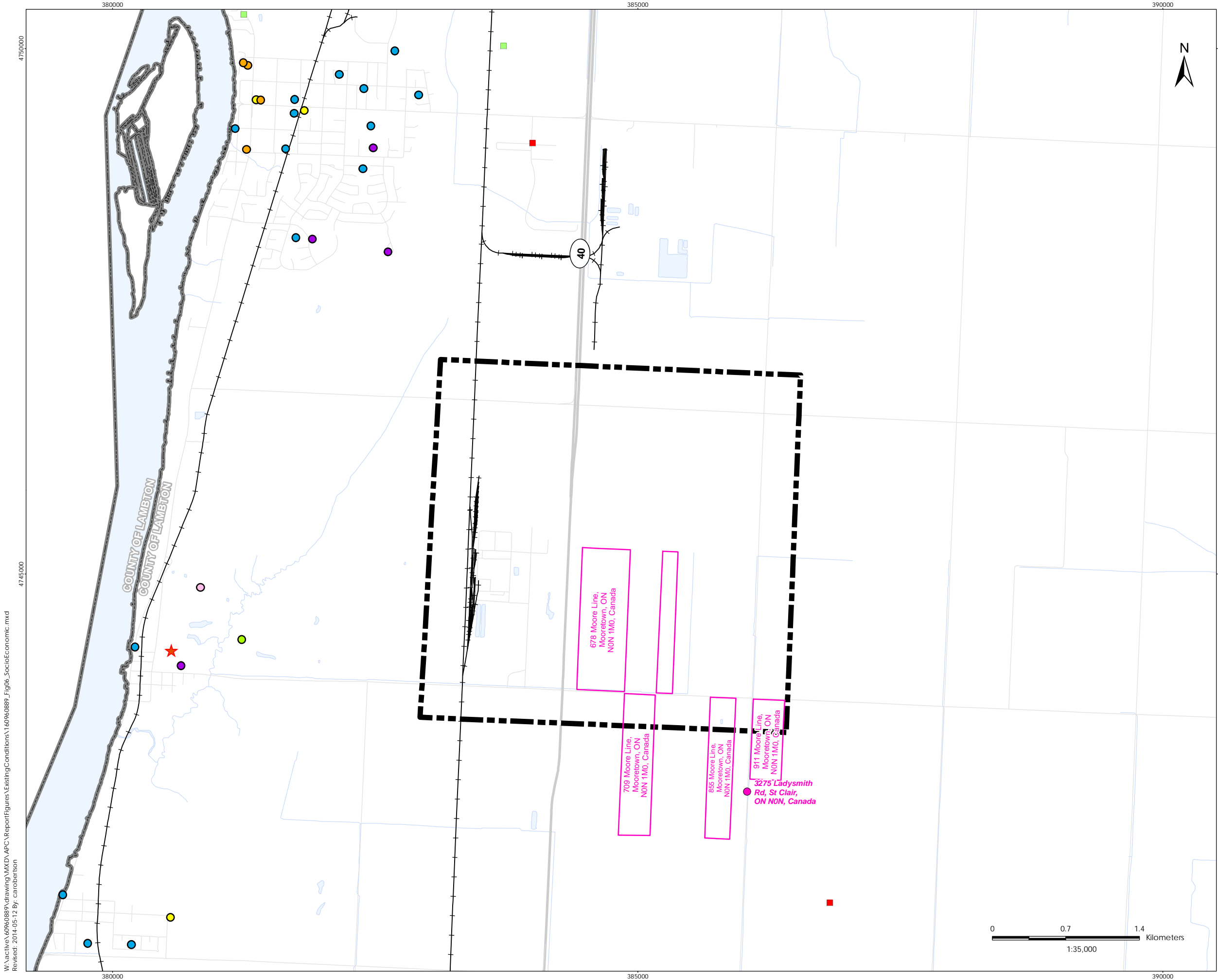
- Study Area
- Expressway / Highway
- Road
- Railway
- Watercourse
- Municipal Boundary
- Regional Municipal Boundary
- Waterbody
- Cultural Heritage Site
- Cultural Heritage Properties
- Socio/Economic
 - Campgrounds
 - Church
 - Fire Hall
 - Golf
 - Mooretown Sports Complex
 - Park
 - School
- Landfill
 - Active
 - Closed



- Notes
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Figure No.
6
Title
Socio-Economic Facilities



Appendix B:

Route Figures



Legend

- Study Area
- Start
- End
- Route Segment A
- Route Segment B
- Route Segment C
- Route Segment D
- Route Segment E
- Route Segment F
- Roads
- Railway
- Watercourse
- Waterbody

Notes

- 1. Coordinate System: NAD 1983 UTM Zone 17N
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- 3. Orthoimagery © First Base Solutions, 2013.

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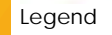
Figure No.

1

Title

Potential Routes





- ## Notes

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2

Preferred Route



Appendix C:

Built and Cultural Heritage Overview, Payne-Sarnia Reinforcement Pipeline Environmental Study

To:	Mark knight	From:	Stantec Consulting Ltd.
	Stantec consulting		Kitchener Office
File:	160960889	Date:	January 17, 2014

Reference: Built and Cultural Heritage Overview, Payne-Sarnia Reinforcement Pipeline Environmental Study

INTRODUCTION

Stantec Consulting Ltd. (Stantec) was retained by Union Gas Ltd. (Union Gas) to conduct a Built and Cultural Heritage Overview (the Heritage Overview) for the Payne-Sarnia Reinforcement Pipeline Environmental Study (the Project). The Project is situated in the former Moore Township, now Township of St. Clair, County of Lambton, Ontario. The Study Area is comprised of approximately 2500 acres and encompasses a 3.25 kilometer square located 2 kilometers east of Mooretown. The study area envelops a large Gas refinery and is located to the south of a solar farm.

The Heritage Overview was prepared to meet the conditions imposed by the 6th Edition of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario* (OEB Guidelines, 2011) in advance of construction of the Project. These require that Heritage Resources, including built heritage and cultural heritage landscapes, are considered prior to any pipeline replacement activities. Specifically, the Guidelines state that: "Any pipeline project that may affect a known or potential built heritage resource, cultural heritage landscape, a known archaeological site, or an area of archaeological potential may require further technical heritage studies by qualified persons". This Heritage Overview was prepared in order to identify areas where further assessment of the built environment may be required, if any.

The Heritage Overview was prepared by a Heritage Consultant specializing in the identification of heritage resources and the evaluation of cultural heritage value or interest (CHVI).

METHODOLOGY

The Heritage Overview was composed of a program of agency consultation, review of historic mapping, and a visual assessment of the Study Area. The Heritage Study is currently ongoing. While conducting research and evaluating potential heritage properties, a list was compiled of individual properties that had the potential to provide Cultural Heritage Value. The results of this initial research and investigation form the basis for the recommendations of this Technical Memorandum.

Agency consultation was conducted to determine the presence of protected properties within the Study Area. Protection of Heritage Resources may include, but is not limited to, designation under the *Ontario Heritage Act* (OHA), a provincial easement made under the OHA, or listing/registering of potential resources by the municipality. Consultation to date has included communication with the following agencies and individuals:

- Ministry of Tourism, Culture, and Sport (MTCS), formerly Ministry of Tourism and Culture (MTC);
- Ontario Heritage Trust (OHT); and
- The Town of Mooretown.

Historic mapping was reviewed to identify areas of high potential for potential heritage resources. Local resources as well as digital material was consulted prior to, and during, the site assessment. The maps reviewed included:

- Belden's Illustrated Historical Atlas of the County of Lambton, Ontario 1880; and
- Local maps of the area at the Lambton Room, Archives of Lambton County.

Following a review of available mapping, a site visit was undertaken to identify potential heritage resources within the Study Area. A windshield survey was conducted on December 17, 2013 by Meaghan Rivard, Heritage Consultant with Stantec and Douglas McGlynn, Heritage Consultant also with Stantec. The weather conditions were overcast with intermittent snow flurries. The Study Area was surveyed for extant buildings, outbuildings, or other built heritage remains.

During the site visit, potential heritage resources, including components of potential cultural heritage landscapes, were photographed and their locations recorded. In general, buildings and structures of more than forty years of age were evaluated during the survey. The use of the forty year threshold is generally accepted by both the federal and provincial authorities as a preliminary screening measure for heritage value or interest. This practice does not imply that all buildings and structures more than forty years of age are inherently of heritage value, nor does it exclude exceptional examples constructed within the past forty years from retaining CHVI.

For the purposes of this overview, the term Heritage Resource refers to a resource where CHVI has been determined according to *Ontario Regulation 9/06*. There are two categories of Heritage Resources: Built Heritage Resources and Cultural Heritage Landscapes.

Throughout this overview, the term Study Area refers to any land or structure in, on, or over which part of the Project is proposed plus a 50m area surrounding the Project components. This includes structures such as the pipeline itself, as well as any temporary work areas (constructible areas) which are required to be utilized during the construction of the Project.

RESULTS

AGENCY CONSULTATION

Jeremy Collins, Acquisitions Coordinator with the OHT, reported that there is no OHT easement site in the vicinity of the Study Area. To date no results have been forthcoming from the MTCS or St. Clair Township.

REVIEW OF HISTORIC MAPPING

The 1880 mapping consulted was reviewed to identify the presence of structures, settlements, and other potential resources. There were two resources identified within the vicinity of the Study Area in Moore Township (Table 2). Both resources were situated along Moore Line and identified as potential heritage resources pending visual confirmation.

Table 1 Potential Historic Resources Identified within the Study Area

Concession	Lot	Owner, 1880	Description Based on Mapping
Concession 6	22	Unknown	Structure is depicted south of the road (855 Moore Line) and appears to be a school.
Concession 7	23	Jno. McLean	Two structures are located on the north side of the road (754 Moore Line)

SITE ASSESSMENT

A total of 93 photographs were taken during the course of the site assessment covering nineteen (19) potential CHR properties. These photographs document the Study Area and adjacent properties where cultural landscapes were considered to potentially span property boundaries. Following the site visit, contemporary mapping was consulted to determine the extent or boundaries of a potential heritage resource. Six potential heritage resources, including those identified during a review of historic mapping, were determined to be situated within the Study Area. These include:

- 3275 Ladysmith Road; Concession 8, Part Lot 22;
- 911 Moore Line; Concession 6, Lot 21;
- 855 Moore Line; Concession 6, Part Lot 22;
- 754 Moore Line; Concession 7, Part Lot 23;
- 709 Moore Line; Concession 6, Lot 23; and
- 678 Moore Line; Concession 7, Part Lot 24.

Section 4.3.4 of the OEB Guidelines list seventeen indicators of CHVI; characteristics that suggest the presence of a potential heritage resource (see Table 3). Of these, six properties within the Study Area were determined to contain indicators of CHVI based on the age of the buildings contained within the property.

Table 2 Potential Heritage Resources

Indicators of Cultural Heritage Value or Interest (CHVI)	Identified within the Study Area
Property designated under Part IV of the Ontario Heritage Act	Not Identified
A bridge on Ontario Heritage Bridge List	Not Identified
Property within a Heritage Conservation District designated under Part V of the Ontario Heritage Act	Not Identified
Property with a Ontario Heritage Trust or municipal heritage conservation easement	Not Identified
Property with a provincial or federal plaque	Not Identified
A National Historic Site	Not Identified
Property with archaeological potential	Not Applicable*
Property listed on a municipal heritage register or the provincial register	Not Identified
Property adjacent to an identified heritage property	Not Identified
Property that has buildings or structures over 40 years old	Identified
Property within a Canadian Heritage River watershed	Not Identified
Property associated with a renowned architect or builder	Not Identified
Property containing or adjacent to a burial site or cemetery	Not Identified
Parkland	Not Identified
Land with distinctive landforms or geographic features	Not Identified
Historic transportation corridors (such as navigational canals, rail lines or trails, traditional Métis portage routes etc)	Not Identified
Other human-made alterations to natural landscapes (such as earthworks, plantings, etc.)	Not Identified

* An Archaeological Assessment has been undertaken under separate cover. Archaeological potential is considered beyond the scope of the current study.

Appendix D:

Consultation and Engagement

Appendix D1:

First Nations, Métis Nation and Agency Contact List

Title	First Name	Last Name	Agency	Position	Address	City-Prov	Postal	Phone	Fax	Email
			Aboriginal Affairs and Northern Development Canada	Consultation and Accommodation Unit						CAU-UCA@aadnc-aandc.gc.ca
Mr.	Rob	Dobos	Environment Canada	Manager, Environmental Assessment Section	867 Lakeshore Road – PO Box 5050	Burlington, ON	L7R 4A6	905 336 4953	905 336 8901	Rob.dobos@ec.gc.ca
Ms.	Ashley	Johnson	Ministry of Aboriginal Affairs	Senior Advisor, Consultation Unit	160 Bloor Street East – 9 th Floor	Toronto, ON	M7A 2E6	416 326 6313		Ashley.johnson@ontario.ca
Mr.	David	Cooper	Ministry of Agriculture & Food	Manager, Environmental & Land Use Policy	1 Stone Road W – 3 rd Floor	Guelph, ON	N1G 4Y2	519 826 3117		David.cooper@ontario.ca
Mr.	Drew	Crinklaw	Ministry of Agriculture & Food	Rural Planner, Southwestern Ontario	667 Exeter Road	London, ON	N6E 1L3	519 873 4085		Drew.crinklaw@ontario.ca
Ms.	Donna	Mundie	Ministry of Agriculture & Food (Ontario Pipeline Coordinating Committee)		1 Stone Road W	Guelph, ON	N1G 4Y2	519 826 3120		Donna.mundie@ontario.ca
Mr.	Michael	Moroney	Ministry of the Environment	Manager, Sarnia District Office	1094 London Road	Sarnia, ON	N7S 1P1	519 383 3780		Michael.moroney@ontario.ca
Mr.	Dan	Dobrin	Ministry of the Environment (Ontario Pipeline Coordinating Committee)	Supervisor – Water Resources	733 Exeter Road	London, ON	N6E 1L3	519 873 5041		Dan.dobrin@ontario.ca
Mr.	Goran	Ciric	Ministry of Municipal Affairs and Housing (Ontario Pipeline Coordinating Committee)	Senior Planner – Planning Innovation Section	777 Bay St., 14 th Floor	Toronto, ON	M5G 2E5	416 585 6246	416 585 6870	Goran.ciric@ontario.ca
Ms.	Sally	Renwick	Ministry of Natural Resources (Ontario Pipeline Coordinating Committee)	Team Lead (Acting) – Environmental Planning Unit	300 Water Street N – 5 th Floor N	Peterborough, ON	K9J 3C7	705 755 5195		Sally.renwick@ontario.ca
Ms.	Amanda	McCloskey	Ministry of Natural Resources	District Planner	615 John Street North	Aylmer, ON	N5H 2S8	519 773 4750		amanda.mccloskey@ontario.ca
Ms.	Sandra	Gilbert	Ministry of Natural Resources	Program Administrator, Petroleum Operations Section	Exeter Road Complex, 659 Exeter Road	London, ON	N6E 1L3	519 873 4638		sandra.gilbert@ontario.ca
Mr.	Chris	Schiller	Ministry of Tourism and Culture (Ontario Pipeline Coordinating Committee)	Manager – Corporate Services Unit	900 Bay Street – 10 th Floor	Toronto, ON	M7A 2E2	416 327 7631		Chris.schiller@ontario.ca
Mr.	Tony	Difabio	Ministry of Transportation (Ontario Pipeline Coordinating Committee)	Senior Planner & Policy Advisor	301 St.Paul Street – 2 nd Floor	St.Catharines, ON	L2R 7R4	905 704 2656		Tony.difabio@ontario.ca
Ms.	Zora	Crnojacki	Ontario Energy Board (Ontario Pipeline Coordinating Committee)	Project Advisor	2300 Yonge Street – 27 th Floor – PO Box 2319	Toronto, ON	M4P 1E4	416 440 8104	416 440 7656	Zora.Crnojacki@oeb.gov.on.ca
Ms.	Patty	Hayman	St. Clair Region Conservation Authority	Director of Planning and Research	205 Mill Pond Crescent	Strathroy, ON	N7G 3P9	519 245 3710 Ext. 25	519 245 3348	phayman@scrcs.on.ca
Mr.	Dallas	Cundick	St. Clair Region Conservation Authority	Environmental Planner/Regulations Officer	205 Mill Pond Crescent	Strathroy	N7G 3P9	519 245 3710 Ext. 23	519 245 3348	dcundick@scrcs.on.ca
Mr.	Oscar	Alonso	Technical Standards and Safety Authority (Ontario Pipeline Coordinating Committee)		3300 Bloor Street W – 14 th Floor, Centre Tower	Toronto, ON	M8X 2X4	416 734 3353	416 231 7525	oalonso@tssa.org
Mr.	Dave	Poslif	Lambton County	Manager – Planning and Development	789 Broadway Street, Box 3000	Wyoming, ON	N0N 1T0	519 845 0801, x 5342	519 845 3817	dave.posliff@county-lambton.on.ca
Mr.	Jason	Cole	Lambton County	Manager – Public Works	789 Broadway Street, Box 3000	Wyoming, ON	N0N 1T0	519 845 0801, x 5370	519 845 3872	jason.cole@county-lambton.on.ca

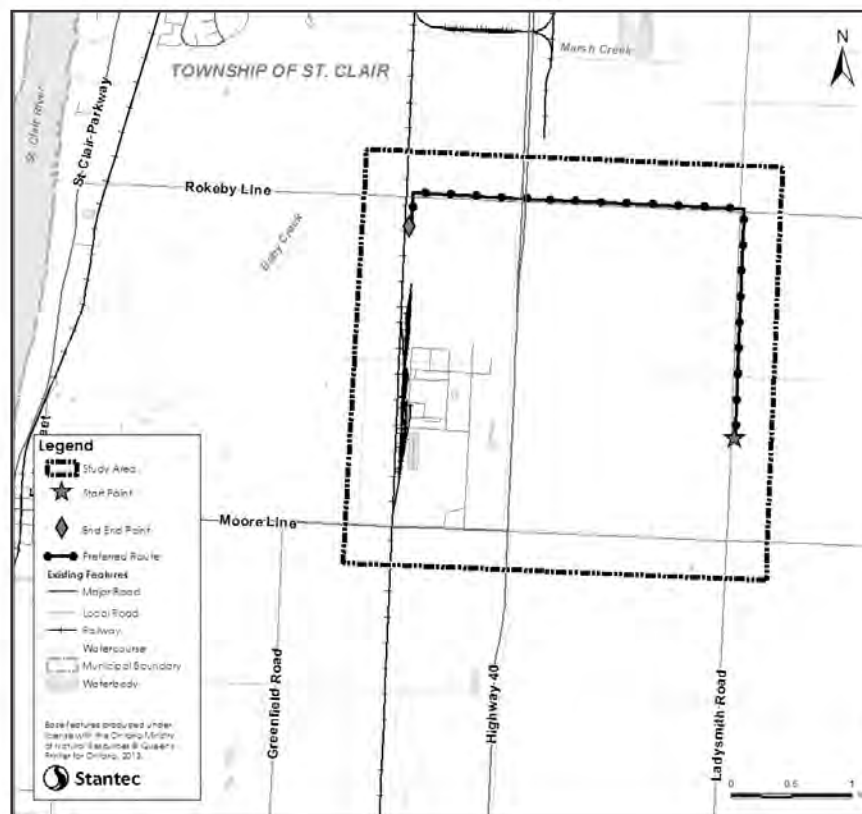
Title	First Name	Last Name	Agency	Position	Address	City-Prov	Postal	Phone	Fax	Email
Mr.	David	Cribbs	Lambton County	Clerks Department – General Manager of Corporate Services	789 Broadway Street, Box 3000	Wyoming, ON	N0N 1T0	519 845 5402		david.cribbs@county-lambton.on.ca
Mr.	Larry	Burnham	Township of St. Clair	Director - Public Works	1155 Emily Street	Mooretown, ON	N0N 1M0	519 867 2993		lburnham@twp.stclair.on.ca
Mr.	Gary	DePooter	Township of St. Clair	Coordinator of Operations	1155 Emily Street	Mooretown, ON	N0N 1M0	519 867 2112	519 867 3886	
Mr.	John	Demars	Township of St. Clair	Clerk	1155 Emily Street	Mooretown, ON	N0N 1M0	519 867 2021		jdemars@twp.stclair.on.ca
Mr.	Jeff	Baranek	Township of St. Clair	Director, Planning	1155 Emily Street	Mooretown, ON	N0N 1M0	519 867 2021		jbaranek@twp.stclair.on.ca
Chief.	Christopher	Plain	Aamjiwnaang First Nation		978 Tashmoo Avenue	Sarnia, ON	N7T 7H5	519 336 8410	519 336 0382	CPlain@aamjiwnaang.ca
Ms.	Shelley	Raymond	Aamjiwnaang First Nation	Band Clerk	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5	519 336 8410	519 336 0382	
Ms.	Sharilyn	Johnston	Aamjiwnaang First Nation	Environmental Officer	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5			sjohnston@aamjiwnaang.ca
Chief	Louise	Hillier	Caldwell First Nation		14 Orange Street – PO Box 388	Leamington, ON	N8H 3W3	519 322 1766	519 322 1533	
Chief.	Thomas	Bressette	Chippewas of Kettle and Stony Point		6247 Indian Lane – RR2	Forest, ON	N0N 1J0	519 786 2125	519 786 2108	
Chief	Joe	Miskokomon	Chippewas of the Thames		320 Chippewa Road – RR1	Muncey, ON	N0L 1Y0	519 289 5555	519 286 2230	
Ms.	Joanne	Meyer	Métis Nation of Ontario		500 Old St. Patrick Street, Unit 3	Ottawa, ON	K1N 9G4			
Chief	Burton	Kewayosh	Walpole Island First Nation		117 Tahgahoning Road – RR3	Wallaceburg, ON	N8A 4K9	519 627 1481	519 627 0440	
Mr.	Dean	Jacobs	Walpole Island First Nation	Consultation Manager	117 Tahgahoning Road – RR3	Wallaceburg, ON	N8A 4K9	519-627-1475	519-627-1530	

Appendix D2:
Newspaper Notice

INITIATION OF ENVIRONMENTAL STUDY AND INFORMATION SESSION

Union Gas Limited - Payne-Sarnia Pipeline Project

To ensure the continued reliable, safe delivery of natural gas and meet increasing demands, Union Gas Limited is proposing to construct a new steel natural gas pipeline 24-inches (610-millimeters) in diameter. The proposed pipeline would commence at Union Gas's existing Payne Storage Pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is Union's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. The preferred route is located on the map below.



As part of the planning process, Union Gas has hired Stantec Consulting to undertake an environmental study of the construction and operation of the natural gas pipeline and conduct an Information Session. The environmental study will fulfill the requirements of the Ontario Energy Board's (OEB) "Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)".

The environmental study process includes consultation and engagement with landowners, First Nations, the Métis Nation of Ontario, government agencies and other local stakeholders. Consultation and engagement is instrumental in various aspects of the environmental study including the evaluation of various pipeline route alternatives; the selection of the preferred pipeline route; and the various protection and mitigation measures used to minimize the effects of constructing and operating the proposed pipeline.

It is anticipated that the Environmental Report for the study will be completed in the Spring of 2014 at which time Union Gas will file an application for the proposed pipeline to the OEB. The OEB's review and approval is required before the proposed natural gas pipeline project can proceed. If approved, construction of the pipeline could begin in the spring of 2015.

An **Information Session** to discuss the project and respond to questions or comments will be conducted as a drop-in centre:

Location: Mooretown Sports Complex
Address: 1166 Emily Street, Mooretown, ON
Date: March 11, 2014
Time: 4:00 – 7:00 pm.

For any questions or concerns regarding the environmental study process or this project, please do not hesitate to contact:

Steve Thurtell
 Project Manager
 Stantec Consulting Ltd.
 70 Southgate Drive, Suite 1
 Guelph, ON N1G 4P5
 Telephone: (519) 836-6050 ext. 208
 steve.thurtell@stantec.com



uniongas

Appendix D3:
Mailouts



February 27, 2014
File: 160960889

Attention: Landowner
Address

Dear Landowner(s),

Reference: Union Gas Limited – Payne Sarnia – Initiation of Environmental Study and Information Session

In response to the increasing demand for natural gas, Union Gas is proposing to construct a new steel natural gas pipeline approximately 4.9 km long and 24-inches (610-millimeters) in diameter. The proposed pipeline would commence at a point from Union Gas's existing Payne Storage Pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek.

As part of the planning process, Union Gas has hired Stantec Consulting to undertake an environmental study of the construction and operation of the proposed Payne Sarnia natural gas pipeline. The environmental study will fulfill the requirements of the Ontario Energy Board's "Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)".

You have received this letter as you own property on or adjacent to the preferred route. Actual siting of the pipeline could occur on either side of the roads. Please find enclosed, a Notice of Project Commencement and Information Session for the Project which includes a map of the preferred route. The details of the information session are listed on the notice. It is an opportunity to learn about the project, meet the project team and ask any questions you may have.

We hope that you can attend. Alternatively, for any questions or concerns regarding the project or the environmental study process please do not hesitate to contact the undersigned.



Please feel free to share this letter with your neighbours. If you are a landowner who has tenants it would also be appreciated if this correspondence could be shared with them.

Regards,

STANTEC CONSULTING LTD.

Steve Thurtell
Project Manager
Phone: (519) 836-6966 x208
Fax: (519) 836-2493
steve.thurtell@stantec.com

Attachment: Study Area Map

c. Tony Vadjla, Union Gas Ltd.

te document1

February 27, 2014
File: 160960892

<<Recipient's Address>>

Attention: <<Title>><<First_Name>><<Last_Name>>

Dear <<Title>><<Last Name>>,

**Reference: Union Gas Ltd. – Initiation of Environmental Study and Notice of Information Session
for the Payne Sarnia Pipeline Project**

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas, Union Gas is proposing to construct a natural gas pipeline. The proposed project includes construction of approximately 5 kms of 24-inch (610 mm) diameter steel natural gas pipeline. The pipeline would commence at Union Gas's existing Payne storage pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. A map of the preferred route is included in the attached notice.

Union Gas is committed to minimizing the effects of their projects and operations on the environment. As an integral part of this project, Union Gas has hired Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the natural gas pipeline. The environmental study will fulfill the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario* (2011).

The environmental study process will include consultation and engagement with landowners, municipalities, government agencies, First Nations, the Métis Nation of Ontario and other interested parties through mail outs, meetings and an Information Session, which will be held on March 11, 2014 and will be instrumental in the completion of the environmental study process. The details of the information session or shown on the attached notice. An Environmental Report will accompany the Union Gas application to the OEB, whose review and approval is needed before this project can proceed. If approved, construction could begin as early as the spring of 2015.

«Community» is invited to provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the project may have on constitutionally protected aboriginal or treaty rights and any measures for mitigating those adverse impacts.

Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory. Information regarding other proposed developments is also requested to be provided, for incorporation into the environmental study as a component of a cumulative effects assessment.

For any questions or concerns regarding the project please do not hesitate to contact the undersigned.

Sincerely,

A handwritten signature in black ink that reads "John Bonin". The signature is written in a cursive, slightly slanted style.

John Bonin
Manager First Nations and Métis Affairs
Union Gas
Box 5353 Station A
109 Commissioners Rd
London Ont. N6A 4P1
Phone: 519-539-8509 ext. 5021063
Email: jbonin@uniongas.com

Attachment: Initiation of Environmental Study and Information Session

c. Steve Thurtell, Stantec Consulting Ltd.



February 27, 2014
File: 160960889

Attention: First Last, Position
Agency Name

Dear Title, Last_Name,

Reference: Union Gas Limited – Payne Sarnia – Initiation of Environmental Study and Information Session

In response to the increasing demand for natural gas, Union Gas is proposing to construct a new steel natural gas pipeline 4.9 km long and 24-inches (610-millimeters) in diameter. The proposed pipeline would commence at Union Gas's existing Payne Storage Pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek.

As part of the planning process, Union Gas has hired Stantec Consulting to undertake an environmental study of the construction and operation of the natural gas pipeline. The environmental study will fulfill the requirements of the Ontario Energy Board's *"Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)"*.

The environmental study process will include consultation and engagement with landowners, First Nations, the Métis Nation, government agencies and other local stakeholders. Consultation and engagement is instrumental in various aspects of the environmental study including the evaluation of various pipeline route alternatives; the selection of the preferred pipeline route; and the various protection and mitigation measures employed to minimize the effects of constructing and operating the proposed pipeline.

It is anticipated that the Environmental Report for the study will be completed in the spring of 2014 at which time Union Gas will file an application for the proposed pipeline to the OEB. The OEB's review and approval is required before the proposed natural gas pipeline project can proceed. If approved, construction of the pipeline could begin in the spring of 2015.

Stantec is presently compiling an environmental and socio-economic inventory of the preferred corridor. As an agency with jurisdiction or a potential interest in developments in the study area you are invited to provide comments, or coordinate comments, regarding the preferred corridor. Specifically, Stantec is seeking information that may affect construction and operation of the proposed pipeline, including: background environmental and socioeconomic information, planning principles or guidelines implemented by your agency, and other proposed



developments to assess potential cumulative effects. Please contact us to discuss the most efficient way to obtain this information.

Please find enclosed a notice of Initiation of Environmental Study and Information Session for the project with preferred route map. The information session is an opportunity to learn about the project, meet the project team and ask any questions you may have.

We hope that you can attend. Alternatively, for any questions or concerns regarding the project or the environmental study process please do not hesitate to contact the undersigned.

Regards,

STANTEC CONSULTING LTD.

UNION GAS LTD.

Steve Thurtell
Project Manager
Phone: (519) 836-6966 x208
Fax: (519) 836-2493
steve.thurtell@stantec.com

Ryan Langan
Lands Agent
Phone: (519) 436-4600 x2652
Fax: (519) 436-5353
rlangan@uniongas.com

Attachment: Initiation of Environmental Study and Information Session

c. Tony Vadlja, Union Gas Ltd.

te document1

Appendix D4:
Display Boards and Exit Questionnaire

**Union Gas Limited - Payne-Sarnia Pipeline Project
Information Session**

Welcome

to the

**Payne-Sarnia Pipeline Project
Information Session**

A Union Gas Pipeline Project

Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Welcome

Thank you for coming. We invite you to view the display boards, speak to members of Union Gas and/or Stantec Consulting Ltd., and complete a questionnaire providing your feedback.

Please sign in at the front desk to have your attendance recorded as part of the environmental study and to receive future Project updates.



Purpose of the Information Session

The purpose of this Information Session is to:

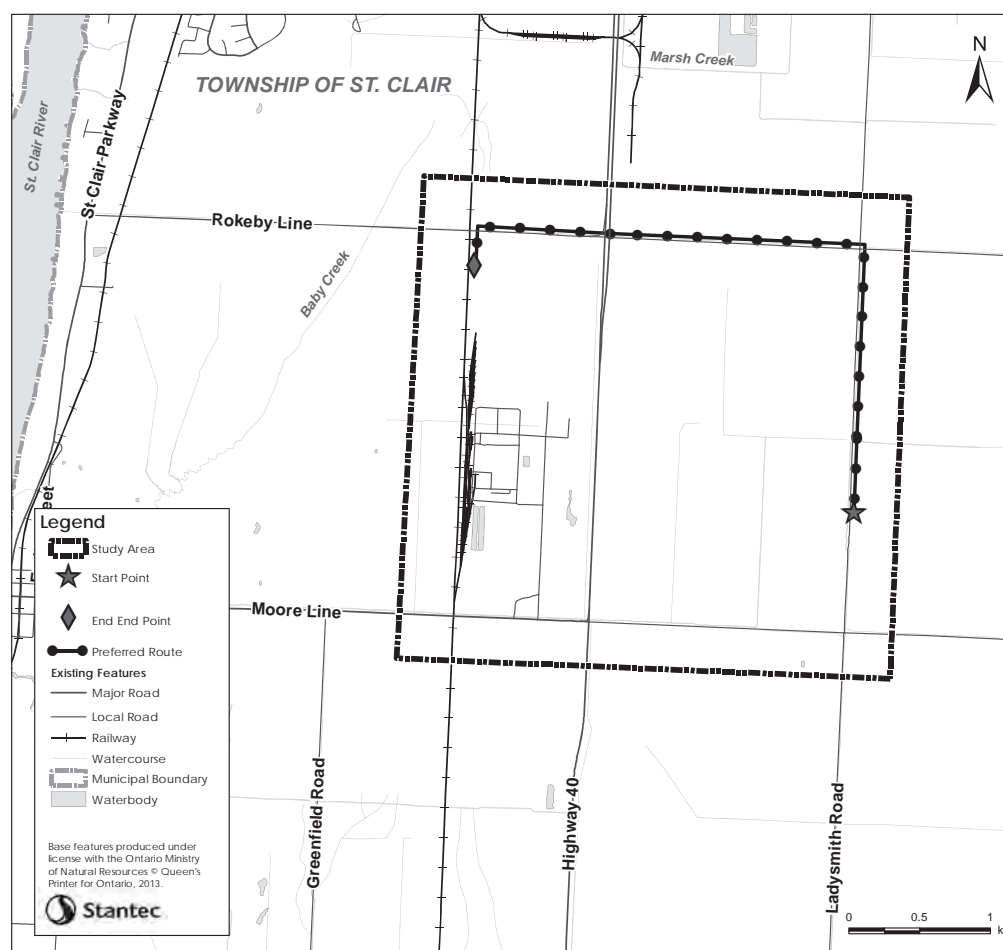
- Introduce the Project to the community and any interested parties
- Inform the community regarding the Project and its details
- Create an atmosphere that will allow for positive consultation with interested parties in regards to this Project
- Respond to questions from interested parties

Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Project Overview

The proposed Project involves the construction of a new 24 inch (610-millimeter) diameter natural gas pipeline approximately 5 kilometres long.

The proposed pipeline would commence at Union Gas' existing Payne Storage Pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is Union Gas' existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek.



Why is Union Gas Undertaking this Project?

The purpose of this Project is to:

- Ensure the **security of supply** for Union Gas' existing customers.
 - Union Gas currently purchases capacity from other pipeline companies to serve the Sarnia area. This supply is becoming more uncertain and costly
 - The proposed facilities will connect to the Union Gas system which has connections to numerous supply sources thus providing enhanced security and reliability of natural gas deliveries to Union Gas' customers
- Meet the **growing demand** for natural gas in Ontario.
 - The industry in the Sarnia area has increased demand for natural gas

Combining these two objectives is an efficient, cost effective way to provide enhanced natural gas service to the area.

Environmental Study

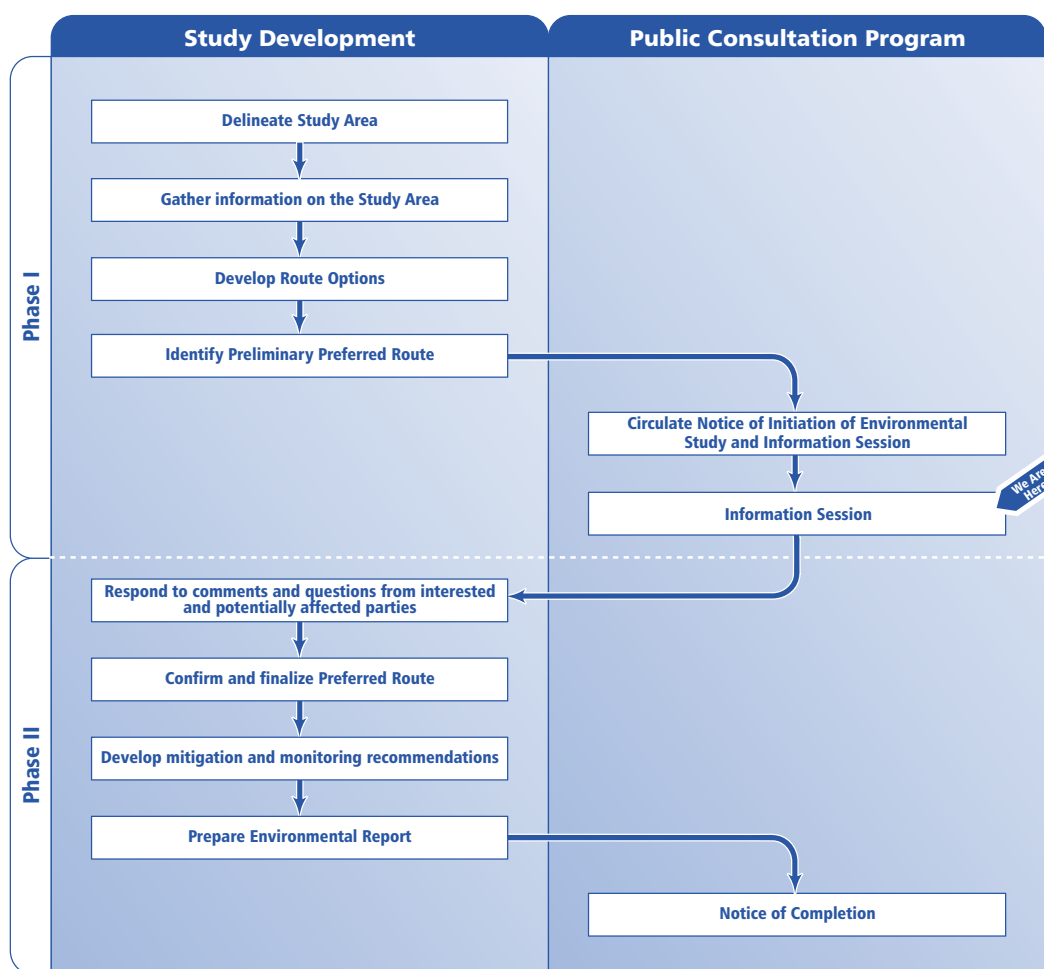
The environmental study and subsequent Environmental Report for the Project will be completed as per the Ontario Energy Board's (OEB) **"Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)"**.

The study will:

- Be conducted during the earliest phase of the Project
- Identify potential impacts of the construction and operation of the proposed pipeline in regards to environmental and socio-economic conditions
- Identify an environmentally acceptable route for the proposed pipeline
- Undertake consultation to understand the views of interested and potentially affected parties
- Assess the potential cumulative effects of the Project in conjunction with other projects that are planned for the area
- Develop mitigation and protective measures to avoid or minimize impacts
- Develop an appropriate inspection, monitoring and follow-up program for the Project, to ensure the success of mitigation and protective measures

Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Environmental Study Process



Ontario Energy Board Review and Approval Process

The Ontario Energy Board (OEB) is the body that regulates the natural gas industry in Ontario, in the public's interest. The OEB's approval is required before this pipeline can be constructed.

Union Gas plans to submit our application for this project to the OEB. This application will include comprehensive information on the project including: the need for the project, facility alternatives, project costs and economics, pipeline design, pipeline construction, environmental mitigation measures, land requirements, and Aboriginal consultation.

The OEB will then hold a public hearing to review the project. This will include notices in local newspapers, letters to directly affected landowners, the opportunity for the general public and landowners to ask questions and submit questions regarding the project, a formal hearing, and a written decision regarding the project.

If after this review the OEB finds the project is in the public interest it will approve construction of the pipeline. If the project is approved the OEB normally attaches conditions to the approval which Union Gas will comply with during the construction and restoration process.

Additional information about the OEB process and information about how to participate in the OEB hearing process can be found <http://www.ontarioenergyboard.ca>

Submit application ➤ Public hearing ➤ Approval ➤ Construction

Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

The Route Selection Process

The Preferred Route for the proposed pipeline will be selected through a five-step process:

Step 1 { **Constraints and Opportunities**
Inventory of environmental and socio-economic features.

Step 2 { **Generate Route Options**
The generation of Route Options is influenced by the following:

- Avoidance to the extent feasible of sensitive socio-economic and environmental features such as communities, wetlands, etc.
- Avoidance to the extent feasible of areas which may present construction difficulties or the potential for long-term maintenance/remedial work.
- Utilizing to the extent feasible existing linear infrastructure, such as hydro corridors, road rights-of-way and property lines.
- The length of the pipeline and associated costs of construction and operation may influence route generation.
- Routes should follow a reasonably direct path between start and end points.

Step 3 { **Route Evaluation**
An evaluation of the Route Options will be conducted based on:

1. A quantitative comparative evaluation of impacts to environmental and socio-economic features.
2. A qualitative comparative evaluation based on stakeholder input and the experience of the Project Team in routing linear infrastructure.

Once complete, a Preliminary Preferred Route will be identified.

Step 4 { **Input on the Preliminary Preferred Route**
The Preliminary Preferred Route is subject to input through a variety of communication and consultation activities, such as an Information Session.

Step 5 { **Confirmation of the Preferred Route**
A Preferred Route will be confirmed. The Preferred Route may require micro-siting as the project moves forward based on the results of pre-construction field investigations, landowner requests, and/or engineering considerations.

Route Options

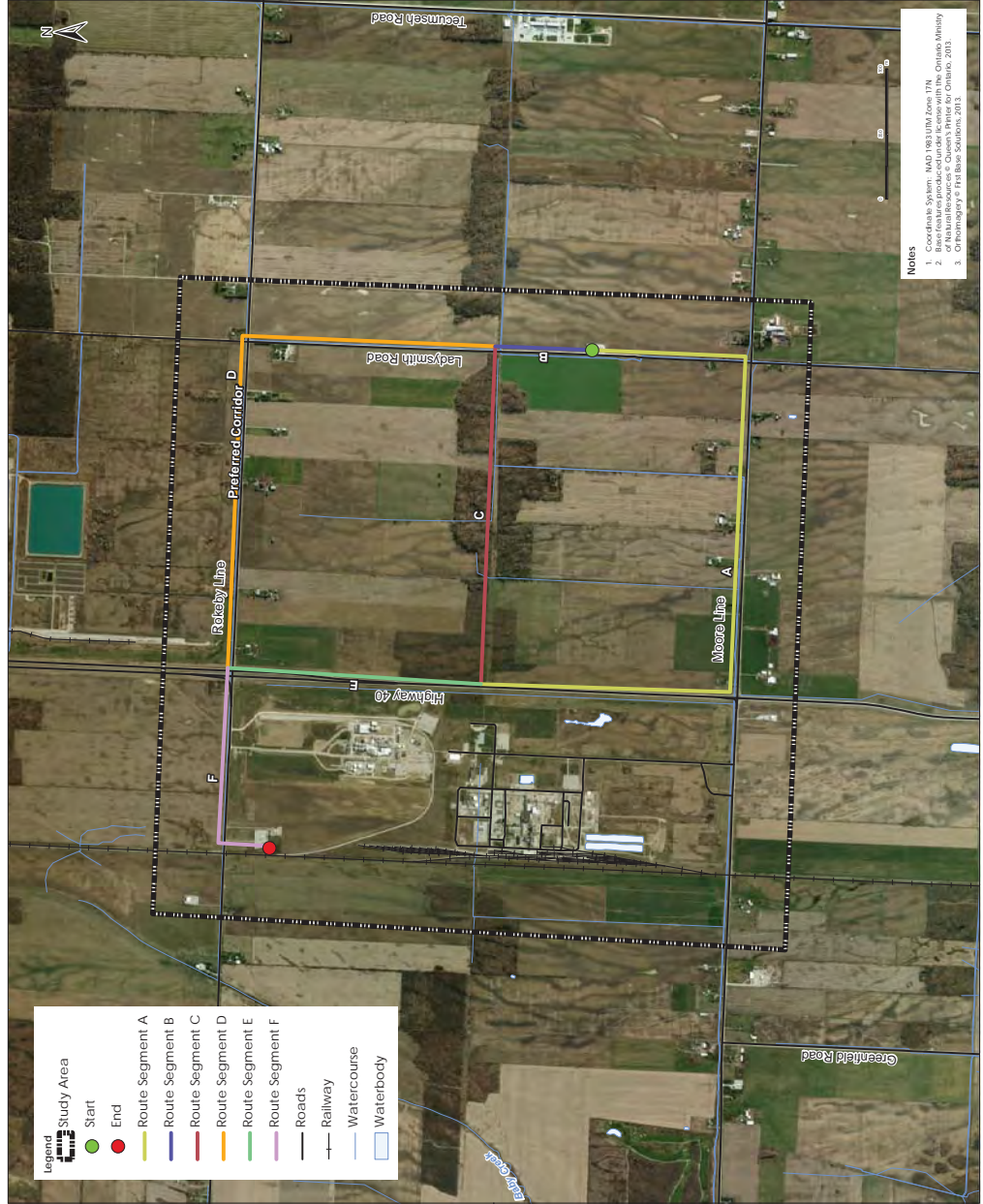
Three Options have been identified:

Route Option 1: Travels from the Payne Storage Pool to the south on Ladysmith Road, turning west onto Moore Line then turning north adjacent to Highway 40 and west onto Rokeby Line to the endpoint between the CN railway and Highway 40.

Route Option 2: Travels from the Payne Storage Pool to the north on Ladysmith Road, turning west in the middle of the concession adjacent to an existing pipeline corridor then north adjacent to Highway 40 and west onto Rokeby Line to the endpoint between the CN railway and Highway 40.

Route Option 3: Travels from the Payne Storage Pool to the north on Ladysmith Road, turning west on Rokeby Line to the endpoint between the CN railway and Highway 40.

Route Options



Selection of the Preliminary Preferred Route

Early in the process, three alternative routes were identified as reasonably feasible options to transport product between the start and end points. A comparative evaluation was then completed to determine the potential environmental and socio-economic effects of the alternative routes. The characteristics considered included:

- Physical – route length
- Agricultural – soil capability
- Aquatic – water wells and water courses
- Terrestrial – tree cutting
- Community Heritage Characteristics – cultural and built features

The result of the evaluation is that Option # 3 (Ladysmith Road to Rokeby Line) is the Preliminary Preferred Route from an environmental and socio-economic perspective. Construction and operation of the proposed pipeline would have the fewest impacts if sited along that route.

Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Existing Features

Data on existing features for the Study Area has been collected from a number of external sources including but not limited to agencies, aerial photography, official plan mapping and natural features mapping. This information has been used to evaluate potential pipeline routes and to generate Route Options.

Additional data collection and agency consultation will continue after this Information Session to confirm the Preferred Route.

Environmental and socio-economic features within the Study Area, relevant to pipeline planning, construction and operation, have been outlined on the following map. The Preferred Route avoids sensitive environmental and socio-economic features where feasible. Where features cannot be avoided, mitigation and protection measures will be employed during pipeline construction and operation.

Natural Environment and Socio-Economic Environment



Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Natural Gas Safety

Union Gas is an experienced pipeline operator, delivering natural gas to customers around the province through more than 60,000km of operational pipelines. Union Gas has safely served the majority of communities in Southwestern Ontario for more than 100 years.

Union Gas pipelines and facilities are designed, constructed and maintained to meet or exceed the stringent codes and requirements of:

- Ontario Energy Board Act
- Canadian Standards Association
- Technical Standards and Safety Authority

Pipelines used to transport natural gas are monitored 24 hours a day. Operators can shut off valves located at regular intervals along the pipeline, as well as stop the flow of gas altogether.



Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Environment

In an effort to protect the natural environment, Union Gas will conduct environmental planning and monitoring:

- Pre-construction
- During construction
- Post-construction

Pre-Construction

- An environmental study is being undertaken to assess potential environmental and socio-economic impacts
- The study will identify the need for field investigations (e.g., species at risk, etc.)

Construction

- An Environmental Inspector will be responsible for ensuring construction activities are conducted in compliance with environmental commitments (e.g., environmental regulatory permits, etc.)

Post-Construction

- A monitoring program will follow construction during the first and/or second complete growing season
- The objective - to ensure that mitigation and protection measures are successful and continue to be effective

Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Construction

Union Gas is committed to minimizing the effects of our projects and operations on the environment. Our environmental management practices help to avoid, mitigate and/or compensate for impacts to environmental and socio-economic features related to our pipeline projects. Such practices relevant to the current Project include:



- Pre-construction environmental planning to avoid, to the extent possible, impacts to environment and socio-economic features
- Environmental management practices to address potential impacts to geophysical features, soil, vegetation, water, wildlife, air quality, noise and socio-economic features
- Contingency plans in the unlikely event of spills, fires, extreme weather conditions, and the discovery of previously unknown heritage resources and/or contaminated soils
- Post construction monitoring and follow-up

Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Consultation

Union Gas is committed to creating opportunities for meaningful input on this Project from all interested and potentially affected parties through:

- Information Session
- Individual Meetings

Consultation is instrumental in the following ways:

- The evaluation of the pipeline Route Options
- The selection of the Preferred Route
- Identification of the various mitigation and protective measures that will be employed to minimize the effects of the construction and operation of the proposed Project

If you wish to discuss the Project privately, please speak to a Project Team member, who can make appropriate arrangements.

Please fill out the exit questionnaire before you leave.



Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Land Requirements

Union Gas is committed to working with all affected landowners along the pipeline route.

Union Gas will commence discussions with the affected landowners as soon as the route is finalized to negotiate the permanent easement and temporary land use rights required for the construction of the pipeline.

Prior to, during and after construction, Union Gas will have a Lands Agent available to keep Landowners informed about the project and to answer any questions or concerns.

Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Project Schedule

Project Timeline



Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Next Steps

After this Information Session, the following will be carried out:

1. Respond to comments/questions received.
2. Confirm study findings to-date based on comments received.
3. Continue data collection.
4. Prepare the Environmental Report.
5. File with OEB.

Union Gas Limited - Payne-Sarnia Pipeline Project Information Session

Thank You!

On behalf of the Project Team, thank you for attending this Information Session. We appreciate your involvement in the consultation process and we would like to hear from you.

Please fill out the Exit Questionnaire. If you have any further comments or questions please contact us through the contact information provided in the handouts.

Please look over the displays and then take a few moments to answer the following questions. Your comments are appreciated. If you require any assistance or clarification while completing the questionnaire please speak with a Union Gas or Stantec representative.

Completed questionnaires can be dropped off at the front table. If you would like additional time to consider your comments, pre-paid envelopes are available at the front table. We request your comments by March 21, 2014.

1. What is your interest in this project?

- ☐ Directly affected landowner
- ☐ Adjacent landowner
- ☐ Interested citizen
- ☐ Member of interest group
- ☐ Government official
- ☐ Other: _____

2. Please identify any environmental features within the Study Area which are either incorrectly mapped, omitted or that you feel are important to consider during the study (please state your reasons).

3. Considering the location of the Project Facilities shown on the displays, please indicate whether there are any potential effects to you, your property, or your business that you would like addressed (i.e., noise, dust, traffic, etc.).

4. Which factors do you feel are most important to compare and evaluate Route Options for pipelines (i.e., protected natural areas, residential properties, agricultural land, watercourses, etc.)?

5. Do you have any other comments about this Project that you would like to bring to our attention?

6. Did the content provided at this Information Session meet your needs?

☐ Yes ☐ No

Please comment:

Thank you for completing this questionnaire.

If you have a question about the Project that you have not been able to have addressed or for which you would like more information, please provide us with your full contact information so that we can respond to you.

Please Print Clearly

Name: _____

Address: _____

Email: _____

Phone: (_____) _____

Information will be collected and used in accordance with the Freedom of Information and Protection of Privacy Act. This information will be used to assist Union Gas in meeting applicable approval requirements. This material will be maintained on file for use during the study and may be included in project documentation. Unless indicated otherwise, personal information and all comments will become part of the public record and publicly released as part of project documentation.

Appendix D5:
Project Correspondence



Project Correspondence Table

Union Gas Limited Payne- Sarnia Pipeline Project

Record	Correspondent	Type	Date	Subject Matter	Forwarded to UGL/Date	Responder /Date	Response	Follow-up
1	Oscar Alonso, TSSA	email		Have you considered a straight line between the start and finish to avoid the high consequence area?	March 12 2014	UGL		
2	Craig Newton, MOE	letter	April 3, 2014	No concerns or comments	NA	NA	NA	NA
3	Kyle McCoey, Suncor	questionnaire	Apr 3, 2014	Main concern is impacts of construction on their business	April 3, 2014	UGL		
4	Tom Wilson, Land tenant	questionnaire	Mar 25, 2014	Didn't get adequate answers to his questions.	Mar 14, 2014	UGL		
5	Jeff Larsen, Landowner	email	Mar 14, 2014	Routing options on his property	Mar 14, 2014	UGL		
6	Heather Riddell, MNR	email	Apr 4, 2014	Barn Swallow is not an issue but Bobolink and Eastern Meadowlark investigations should be done where appropriate.	Apr 4, 2014	Thurtell/ Apr 4, 2014	Message received. Thank you for your input.	NA

From: Oscar Alonso <oalonso@tssa.org>
Sent: Friday, March 07, 2014 12:17 PM
To: Thurtell, Steve
Subject: Payne-Sarnia Pipeline Project. Your File 160960889

Dear Mr. Thurtell,

This is in response to your letter dated February 27, 2014 regarding the referenced project.

As this proposed pipeline appears to be a transmission line, I wonder if the alternatives to the "preferred route" in the enclosed notice of initiation of Environmental Study have been already considered. The High Consequence Area (HCA) as defined in the Fuels Safety Program document FS-196-12 may affect residences along the roads where the pipeline is proposing to be installed.

Was a straight line between the start and end points has been evaluated? Although this would require a new easement, it would be interesting to see if this alternative would be viable.

Regards, .

Oscar Alonso, P.Eng.,
Fuels Safety Engineer

This electronic message and any attached documents are intended only for the named recipients. This communication from the Technical Standards and Safety Authority may contain information that is privileged, confidential or otherwise protected from disclosure and it must not be disclosed, copied, forwarded or distributed without authorization. If you have received this message in error, please notify the sender immediately and delete the original message.

From: STRAITLINE CONTRACTING <straitlinecontracting@gmail.com>
Sent: Friday, March 14, 2014 12:38 PM
To: Thurtell, Steve
Cc: rlangan@uniongas.com
Subject: Sarnia - Payne Pipeline
Attachments: Pipeline.xps

Steve

Should negotiations with the township for a road allowance for the proposed pipeline fail, I have a couple of other options for you to consider with regards to your pipeline routing and have attached a map with them plotted on it. After talking to Mel and Joe Anderson yesterday, they would prefer route 1 as it has the least impact to the existing tile. I on the other hand I like # 2 as it would have no effect on our bush (its already cleared) and as long as it was to go west within 500' of the south property line, it would not have a significant impact on our runway.
Just food for thought.

Regards
Jeff Larsen

From: Riddell, Heather (MNR) <Heather.Riddell@ontario.ca>
Sent: Friday, April 04, 2014 11:48 AM
To: Thurtell, Steve
Subject: RE: Union Gas Limited - Payne Sarnia - Initiation of Environmental Study and Information Session

Hi Steve,

I mistyped your email address the first time around – hope this one reaches you.

Regards,
Heather

Heather Riddell
District Planner
MNR Aylmer District
519-773-4757
heather.riddell@ontario.ca

From: Riddell, Heather (MNR)
Sent: April 4, 2014 11:27 AM
To: 'steve.thurtell@stante.com'; 'rlangan@uniongas.com'
Subject: Union Gas Limited - Payne Sarnia - Initiation of Environmental Study and Information Session

Dear Mr. Thurtell and Mr. Langan,

Thank you for your notice of Initiation of Environmental Study and Information Session for Union Gas Limited's Payne Sarnia pipeline project. The Ministry of Natural Resources (MNR) understands that Stantec Consulting has been retained to undertake an environmental study of the construction and operation of the natural gas pipeline to fulfill the requirements of the Ontario Energy Board's *"Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)"*.

An initial species at risk (SAR) screening has been completed for Union Gas Limited's proposed natural gas pipeline, which commences at Union Gas's existing Payne Storage Pool on Ladysmith Road between Rokeby Line and Moore Line, with a proposed endpoint at Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek in the County of Lambton.

The Species at Risk in Ontario (SARO) List is Ontario Regulation 230/08 issued under the *Endangered Species Act, 2007* (ESA 2007). The ESA 2007 came into force on June 30, 2008, and provides both species protection (section 9) and habitat protection (section 10) to species listed as endangered or threatened on the SARO List. The current SARO List can be found on e-laws (<http://www.e-laws.gov.on.ca/navigation?file=home&lang=en>).

The MNR would like to provide you with the following information.

There are no known occurrences of SAR on the property, though there are known occurrences of SAR in the general project area, including:

- Barn Swallow (THR) – receives species and general habitat protection
- Bobolink (THR) – receives species and general habitat protection
- Eastern Meadowlark (THR) – receives species and general habitat protection

Based on this initial screening it does not appear as though the proposed works will have adverse effects on Barn Swallow or their habitat. Bobolink and Eastern Meadowlark are ground nesting birds and could potentially be encountered at this project site. Once project details have been confirmed, including anticipated timing and duration, we recommend contacting the MNR for a Letter to Proponent. The Letter to Proponent may include recommending the following:

- if any birds' nests are encountered during the bird breeding season (May 1 to August 1) on the project site, crews should stop work until it can be established that the nest is not being used; and
- if the above species or any other SAR are encountered in the course of the work, these observations should be reported to the Aylmer District MNR office as soon as possible.

Please note that this is an initial screening for SAR and the absence of an element occurrence does not indicate the absence of species. The province has not been surveyed comprehensively for the presence or absence of SAR, and MNR data relies on observers to report sightings of SAR. Field assessments by a qualified professional may be necessary if there is a high likelihood for SAR species and/or habitat to occur within the project footprint.

It is important to note that changes may occur in both species and habitat protection which could affect whether proposed projects may have adverse effects on SAR. The Committee on the Status of Species at Risk in Ontario (COSSARO) meets regularly to evaluate new species for listing and/or re-evaluate species already on the SARO List. As a result, species designations may change, which could in turn change the level of protection they receive under the ESA 2007. Also, habitat protection provisions for a species may change if a species-specific habitat regulation comes into effect.

If an activity or project will result in adverse effects to endangered or threatened species and/or their habitat, additional action would need to be taken in order to remain in compliance with the ESA 2007. Additional action could be applying for an authorization under section 17(2)c of the ESA 2007, or completing an online registry for an ESA 2007 regulation if the project is eligible.

Please be advised that applying for an authorization does not guarantee approval and the process can take several months. Please visit MNR's website to determine whether a project may be eligible for the online registry process (http://www.mnr.gov.on.ca/en/About/2ColumnSubPage/STDPROD_104342.html). Questions about the registry process should be directed to MNR's Registry and Approval Services Centre at 1-855-613-4256 or at mnr.rasc@ontario.ca.

If you have any questions, please feel free to contact me at heather.riddell@ontario.ca or 519-773-4757.

Regards,
Heather

Heather Riddell
District Planner
Ministry of Natural Resources
Aylmer District
615 John Street North
Aylmer, ON N5H 2S8
Tel: 519-773-4757
heather.riddell@ontario.ca

Information Session Questionnaire – March 11, 2014

Please look over the displays and then take a few moments to answer the following questions. Your comments are appreciated. If you require any assistance or clarification while completing the questionnaire please speak with a Union Gas or Stantec representative.

Completed questionnaires can be dropped off at the front table. If you would like additional time to consider your comments, pre-paid envelopes are available at the front table. We request your comments by March 21, 2014.

1. What is your interest in this project?

- ☒ Directly affected landowner
- ☒ Adjacent landowner
- ☐ Interested citizen
- ☐ Member of interest group
- ☐ Government official
- ☐ Other: _____

2. Please identify any environmental features within the Study Area which are either incorrectly mapped, omitted or that you feel are important to consider during the study (please state your reasons).

3. Considering the location of the Project Facilities shown on the displays, please indicate whether there are any potential effects to you, your property, or your business that you would like addressed (i.e., noise, dust, traffic, etc.).

4. Which factors do you feel are most important to compare and evaluate Route Options for pipelines (i.e., protected natural areas, residential properties, agricultural land, watercourses, etc.)?

Information Session Questionnaire – March 11, 2014

5. Do you have any other comments about this Project that you would like to bring to our attention?

WHEN SOMEONE HAS A CONCERN ABOUT THE PIPELINE PROJECT AN ANSWER OF "UNION GAS HAS DONE MANY PIPELINES BEFORE, THEY KNOW WHAT THEY ARE DOING" IS NOT THE ANSWER I WAS LOOKING FOR!

6. Did the content provided at this Information Session meet your needs?

☐ Yes

☒ No

Please comment:

WHEN YOU HAVE AN INFORMATION SESSION IN THE FUTURE PLEASE HAVE PEOPLE THERE THAT HAVE SOME KNOWLEDGE OF THE PROJECT.

Thank you for completing this questionnaire.

If you have a question about the Project that you have not been able to have addressed or for which you would like more information, please provide us with your full contact information so that we can respond to you.

Please Print Clearly

Ministry of the Environment

733 Exeter Road
London ON N6E 1L3
Tel.: 519 873-5000
Fax: 519 873-5020

Ministère de l'Environnement

733, rue Exeter
London ON N6E 1L3
Tél.: 519 873-5000
Télééc.: 519 873-5020



April 3rd, 2014

Stantec Consulting Ltd.
70 Southgate Drive
Suite 1
Guelph, Ontario
N1G 4P5

Attention: Mr. Steve Thurtell, Project Manager

**Re: Union Gas Limited – Proposed Payne - Sarnia Pipeline Project Initiation of
Environmental Study and Information Session**

Dear Mr. Thurtel:

This letter is in response to the February 27th, 2014 Notice of Project Initiation addressed to this Ministry's Sarnia District Office for the above noted project. Union Gas Limited is reportedly following the Ontario Energy Board's "Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario [2011]" for this project.

Based on the information provided in the Notice of Initiation this ministry has no concerns or comments to offer at this time. Thank you for providing this ministry the opportunity to comment.

Yours truly,

Craig Newton
Regional Environmental Planner / EA
Ministry of the Environment
Southwestern Region
(519) 873-5014

Mr. Michael Moroney, District Manager, MOE Sarnia District / Windsor Area Office
Mr. Chris Hutt, Senior Environmental Officer, MOE Sarnia District
Mr. Andrew Woodhouse, Senior Environmental Officer, MOE Sarnia District
Mr. Tony Vadjla, Union Gas Limited, Chatham, Ontario.

Information Session Questionnaire – March 11, 2014

Please look over the displays and then take a few moments to answer the following questions. Your comments are appreciated. If you require any assistance or clarification while completing the questionnaire please speak with a Union Gas or Stantec representative.

Completed questionnaires can be dropped off at the front table. If you would like additional time to consider your comments, pre-paid envelopes are available at the front table. We request your comments by March 21, 2014.

1. What is your interest in this project?

- ☐ Directly affected landowner
- ☐ Adjacent landowner
- ☐ Interested citizen
- ☐ Member of interest group
- ☐ Government official
- ☐ Other: _____

** Please see attached
FOR RESPONSES TO
CONCERNS.*

2. Please identify any environmental features within the Study Area which are either incorrectly mapped, omitted or that you feel are important to consider during the study (please state your reasons).

3. Considering the location of the Project Facilities shown on the displays, please indicate whether there are any potential effects to you, your property, or your business that you would like addressed (i.e., noise, dust, traffic, etc.).

4. Which factors do you feel are most important to compare and evaluate Route Options for pipelines (i.e., protected natural areas, residential properties, agricultural land, watercourses, etc.)?



Payne-Sarnia Pipeline Project



Information Session Questionnaire – March 11, 2014

5. Do you have any other comments about this Project that you would like to bring to our attention?

6. Did the content provided at this Information Session meet your needs?

☐ Yes ☐ No

Please comment:

Thank you for completing this questionnaire.

If you have a question about the Project that you have not been able to have addressed or for which you would like more information, please provide us with your full contact information so that we can respond to you.

Please Print Clearly

Name: KYLE MCCOY (SUNCOR ENERGY)

Address: PO Box 2844 150 - 6 AVE SW CALGARY AB

T2P 3E3

Email: KMCCOY@SUNCOR.COM

Phone: (403) 296-7349

Information will be collected and used in accordance with the Freedom of Information and Protection of Privacy Act. This information will be used to assist Union Gas in meeting applicable approval requirements. This material will be maintained on file for use during the study and may be included in project documentation. Unless indicated otherwise, personal information and all comments will become part of the public record and publicly released as part of project documentation.

INFORMATION SESSION QUESTIONNAIRE – MARCH 11, 2014

1. What is our interest in this project?

Operating industrial site (Suncor Energy Ethanol Inc.) directly impacted by the proposed pipeline installation, as the pipeline will cross our only (Main) access and egress to and from the site (St. Clair Ethanol Ave.). In addition, potential operational interruptions/disruptions and emergency vehicle access/egress problems due to uproad installation where pipeline crosses Rokeby Line and Highway 40N.

2. Please identify any environmental features within the Study Area which are incorrectly mapped, omitted or that you feel are important to consider during the study (please state your reasons).

Please reference Drawing No. PL257-04;

- The aerial photograph is not recent within the last 3 years.
- The construction access road to the west of the Suncor Energy, St. Clair Ethanol site main entrance (coordinates H7 through H10 on the drawing/map) does not exist any longer; this road was a temporary access road constructed for the use of contractors during our Ethanol Plant Phase II Expansion from 2009 – 2011. In accordance with our Site Plan Agreement with the Township of St. Clair and the Ministry of Transportation, this construction access road was decommissioned, the berms replaced fronting Rokeby Line and the shoulder and sod replaced.
- The point at which the proposed Union Gas pipeline crosses Rokeby Line and onto the shoulder is within the MTO Control Area on the site of 396m; easement will be required to be obtained from MTO.
- The aerial photograph does not illustrate the Suncor entrance sign to the east of our Main entrance, nor does it illustrate the main hydro feeder pole to the west of our Main entrance. Both of these features, either side of our entrance will be obstructions/impedances to be considered by Union Gas when pipeline installation occurs, if it is insisted that it cross our only main entrance.

3. Considering the location of the Project Facilities shown on the displays, please indicate whether there are any potential effects to you, your property, or your business that you would like addressed (i.e., noise, traffic, etc.).

- No information provided as to the methods to be used for pipeline installation (only proposed route of pipeline); definite (not potential) effects with respect to property access by our employees (30-40 vehicles/day), raw materials suppliers (140 transport trucks/day), product transport vehicles (30/day), emergency service vehicles in the event of an accident, spill, fire, etc.
- In the event of emergency, the only access/egress to/from our site would be either totally blocked or severely impaired. Safety, environmental, firefighting liabilities would be impacted.

4. Which factors do you feel are most important to compare and evaluate Route Options for pipelines (i.e., protected natural areas, residential properties, agricultural land, watercourses, etc.)?

- Disruption/Interruption to our Operations.
- Impairment of safe, environmentally acceptable operations on our site.
- Disruption/interruption/impairment to safe access/egress to/from the site.

- Potential safety concern with respect to ability for emergency service vehicle (fire, ambulance, etc.) access to the site.

5. Do you have any other comments about this Project that you would like to bring to our attention?

- How is Union Gas to ensure that there will be no interruption or major disruption to our Operations with respect to our raw material supply (corn), our delivery transports to our customers, deliveries to the site of critical materials necessary to operate the site safely and environmentally, etc? This is being stated in light of the fact that the majority of our transport traffic comes in from Highway 40N, onto Rokeby Line and then onto the site; Union Gas plans to cross Highway 40 at Rokeby Line (north of intersection), cross Rokeby Line before our Main entrance and then again at our Main entrance. This indicates potential for interruption, disruption to our operations on at least 3 separate occasions during the installation of this pipeline. Suncor Energy, St. Clair Ethanol Plant is requesting that there be assurances on the part of Union Gas that these interruptions/disruptions to our operations does not occur.

6. The content provided in this Information Session did not meet our needs;

- No civil engineering drawings providing detail concerning the methods for pipeline installation (i.e., trenching, directional drilling, etc.). No plan profiles of the directional drilling being planned, if that is the method to be employed.
- No details concerning the planned offset distances for the directional drilling (if planned) or the excavations (if planned); how is Union Gas going to ensure that offsets are far enough away to reduce impairment to our operations? What are the planned setbacks, considering that there is a sign and a hydro feeder pole either side of our main entrance?
- Where is the contractor equipment to be mobilized/stationed such that it does not constitute an obstruction or impairment to our operations? Rokeby Line is a narrow roadway; trucks entering/exiting our site will be impacted by the current location of the proposed pipeline installation.

OPCC Review Comments Summary
SARNIA EXPANSION PIPELINE PROJECT
Current as of: July 10, 2014

RECORD	STAKEHOLDER	COMMENT SUMMARY	RESPONSE SUMMARY
1	<ul style="list-style-type: none"> Oscar Alonso, TSSA Letter dated June 18, 2014 	“We agree with the route selection as stated in the Environmental Report.”	No response required.
2	<ul style="list-style-type: none"> Chris Durand, SCRCA Email communication dated May 27, 2014 	“At this time the SCRCA does not have any comments/concerns however if any works are proposed in areas affected by regulations, a permit from the SCRCA will be required.”	No response required.
3	<ul style="list-style-type: none"> Heather Riddell, OMNRF Email communication dated June 27, 2014 	<p>“We expect that Stantec will continue to consult staff in the MNRF District Office with respect to detailed design of the preferred route and ensuring that <i>Endangered Species Act</i>, 2007 requirements are considered as part of the Environmental Assessment process for this project.”</p> <p>“At this time, it is difficult for MNRF to provide comments without further details on proposed field survey work. MNRF recommends that field surveys are undertaken as early in the planning process as possible to identify and evaluate the significance natural heritage features and determine options for avoiding impacts to natural heritage as a first step, and mitigating negative impacts where necessary.”</p> <p>“MNRF will be able to provide more detailed comments upon receiving results from the proposed field surveys.”</p>	<p>07/10/14 email response</p> <p>Thank you for your input. Stantec and Union Gas Ltd. are committed to continuing with the studies and consultation with your agency throughout this process.</p>

File #	PIN	NAME & ADDRESS	PROPERTY DESCRIPTION	PERMANENT EASEMENT Dimensions (Metres) Area Width Length (Hectares)	TEMPORARY EASEMENT Dimensions (Metres) Area Width Length (Hectares)	FEE SIMPLE PURCHASE	MORTGAGE, LIEN/LEASE &/OR ENCUMBRANCES
1	43295-0078	Moore Solar, Inc., c/o Nextera Energy Resources, LLC, 700 Universe Boulevard, Juno Beach, Florida USA 33480	Part of Lot 25, Concession 9, Moore, Township of St. Clair	15.0m x 433m (0.65)	50.0m x 100m (0.33) 45.0m x 265m (1.10) 12.0m x 7m (0.1)		(e) Novacor Moore Polyethylene Inc. 734 Seventh Ave. S.W., #1600 Calgary, Alberta T2P 3P9 #L600835 (e) Union Carbide Canada Limited, 123 Eglinton Ave. East, Toronto, ON M4P 1J3 #L483989 (a) Polysar Hydrocarbons Limited, 201 N. Front Street, Sarnia, ON N7T 7V1 #L711352 (e) Nova Chemicals Corporation , P.O.Box 3060, Sarnia, ON N7T 8C7 #LA97279 (a) The Corporation of the Township of St. Clair 1155 Emily Street, Mooretown, ON N0N 1M0 #LA97438 (m) BNY Trust Company of Canada 320 Bay Street, 11th Floor, Toronto, ON M5H 4A6 #LA111776
2	43295-0115	Her Majesty the Queen, in Right of the Province of Ontario, Represented by the Ministry of Transportation and Communications 301 St. Paul Street St. Catharines, ON L2R 7R4	Part of Lot 25, Concession 9, Moore, Township of St. Clair	15.0m x 197m (0.30)			NIL

File #	PIN	NAME & ADDRESS	PROPERTY DESCRIPTION	PERMANENT EASEMENT Dimensions (Metres) Area Width Length (Hectares)	TEMPORARY EASEMENT Dimensions (Metres) Area Width Length (Hectares)	FEE SIMPLE PURCHASE	MORTGAGE, LIEN/LEASE &/OR ENCUMBRANCES
3	43295-0080	Moore Solar, Inc., c/o Nextera Energy Resources, LLC, 700 Universe Boulevard, Juno Beach, Florida USA 33480	Part of Lot 26, Concession 9, Moore, Township of St. Clair	15.0m x 184m (0.30)	11.0m x 214m (0.25) 34.0m x 29.0m (0.10) 45.0m x 45.0m (0.20) 12.0m x 4.0m (.005)		(e) Union Gas Limited 50 Keil Drive North Chatham, ON N7M 5M1 #PP1089 (a) The Corporation of the Township of St. Clair 1155 Emily Street, Mooretown, ON N0N 1M0 #LA97438 (m) BNY Trust Company of Canada 320 Bay Street, 11th Floor, Toronto, ON M5H 4A6 #LA111776

File #	PIN	NAME & ADDRESS	PROPERTY DESCRIPTION	PERMANENT EASEMENT Dimensions (Metres) Area Width Length (Hectares)	TEMPORARY EASEMENT Dimensions (Metres) Area Width Length (Hectares)	FEE SIMPLE PURCHASE	MORTGAGE, LIEN/LEASE &/OR ENCUMBRANCES
4	43297-0190	Praxair Canada Inc., 915 South Vidal Street Sarnia, ON N7T 7L7	Part of Lot 26, Concession 8, Moore, Township of St. Clair			Irregular shape (2.54)	(e) Union Gas Limited 50 Keil Drive North Chatham, ON N7M 5M1 #PP1087, PP1088, L431478, L713853, L877577 (a) The Corporation of the Township of St. Clair 1155 Emily Street, Mooretown, ON N0N 1M0 #L367959 (e) Novacor Moore Polyethylene Inc. 734 Seventh Ave. S.W., #1600 Calgary, Alberta T2P 3P9 #L595647 (e) Petrosar Limited, Box 7000, Corunna, ON N0N 1G0 #L483987 (e) Polysar Hydrocarbons Limited, 201 N. Front Street, Sarnia, ON N7T 7V1 #L711346 (o) Niagara Gas Transmission Limited, c/o The Consumers' Gas Company Ltd., Box 650, Scarborough, ON M1K 5E3 #L781151

File #	PIN	NAME & ADDRESS	PROPERTY DESCRIPTION	PERMANENT EASEMENT Dimensions (Metres) Area Width Length (Hectares)	TEMPORARY EASEMENT Dimensions (Metres) Area Width Length (Hectares)	FEE SIMPLE PURCHASE	MORTGAGE, LIEN/LEASE &/OR ENCUMBRANCES
5	43298-0084	Mooreglen Farms Limited, 911 Moore Line, Mooretown, ON N0N 1M0	Part of Lot 21, Concession 7, Moore, Township of St. Clair	8.0m x 510m (0.41)	6.0m x 359m (0.22) 45.0m x 45m (0.20) 6.0 x 45.0m (.03) 14.0m x 50.0m (.07)		(a) Union Gas Limited 50 Keil Drive North Chatham, ON N7M 5M1 #MO27184, MO29700, L112733, L206874, L252640 (e) Niagara Gas Transmission Limited, c/o Enbridge Gas Distribution Inc., 3595 Tecumseh Road, Mooretown, ON N0N 1M0 #L781571 (m) Farm Credit Canada, 1133 St. George Blvd. #200, Moncton, NB E1E 4E1 #LA53317 (m) Farm Credit Canada, R.R.#1, Mooretown, ON N0N 1M0 #L904073
6	43298-0064	Carla Fracalanza	Part of Lot 21, Concession 8, Moore, Township of St. Clair	8.0m x 50m (0.04)	14.0m x 50m (0.07) 15.0m x 1243m (1.86) 45.0m x 45.0m (0.20)		(m) The Toronto-Dominion Bank, 4201 Petrolia Line, Petrolia, ON N0N 1R0 #LA123796 (a) Enbridge Gas Distribution Inc., 3595 Tecumseh Road, Mooretown, ON N0N 1M0 MO27374, MO3111, L157588, L209146 (a) Union Gas Limited 50 Keil Drive North Chatham, ON N7M 5M1 #MO27374, MO29826, L209146, L544447

File #	PIN	NAME & ADDRESS	PROPERTY DESCRIPTION	PERMANENT EASEMENT Dimensions (Metres) Area Width Length (Hectares)	TEMPORARY EASEMENT Dimensions (Metres) Area Width Length (Hectares)	FEE SIMPLE PURCHASE	MORTGAGE, LIEN/LEASE &/OR ENCUMBRANCES
7	43295-0082	Nova Chemicals (Canada) Ltd. 785 Petrolia Line, Corunna, ON N0N 1G0	Part of Lots 22, 23 & 24, Concession 9, Township of St. Clair	15.0m x 1778m (2.67)	11.0m x 35m (0.04) 15.0m x 30.0m (0.05) 56.0m x 38.0m (0.13) 18.0m x 264.0m (0.38) 11.0m x 1795m (1.94) 3.0m x 4.0m (0.001)		(a) Enbridge Gas Distribution Inc., 3595 Tecumseh Road, Mooretown, ON N0N 1M0 MO27293, L249599 (a) Union Gas Limited 50 Keil Drive North Chatham, ON N7M 5M1 #L419421, L491422, L429344 (a) Dancy Broadcasting Limited 400 University Ave, #2500, Toronto, ON M5G 1S8 #L262326, L358104 (e) Union Carbide Canada Limited, 123 Eglinton Ave. East, Toronto, ON M4P 1J3 #L483988, L595648 (e) Novacor Moore Polyethylene Inc. 734 Seventh Ave. S.W., #1600 Calgary, Alberta T2P 3P9 #L483988, L595646, L595649 (a) The Corporation of the Township of St. Clair 1155 Emily Street, Mooretown, ON N0N 1M0 #L491504, L511657 (a) Ministry of the Environment Ontario, 135 St. Clair Ave. West, Toronto, ON M4P 1J3 #L575022 (a) Polysar Hydrocarbons Limited, 201 N. Front Street, Sarnia, ON N7T 7V1 #L711348 (m) Citibank Canada, 123 Front Street, Toronto, ON M5J 2M3



PIPELINE EASEMENT

(the "Easement")

Between

(hereinafter called the "Transferor")

and

UNION GAS LIMITED

(hereinafter called the "Transferee")

This easement is an Easement in Gross

WHEREAS the Transferor is the owner in fee simple of those lands and premises more particularly described as: **PIN:** **Legal Description:** (hereinafter called the "Transferor's Lands").

The Transferor does hereby GRANT, CONVEY, TRANSFER AND CONFIRM unto the Transferee, its successors and assigns, to be used and enjoyed as appurtenant to all or any part of the lands, the right, liberty, privilege and easement on, over, in, under and/or through a strip of the Transferor's Lands more particularly described as: Choose an item. **PIN:** **Legal Description:** Click here to enter text. (hereinafter called the "Lands") to survey, lay, construct, maintain, brush, clear trees and vegetation, inspect, patrol, alter, remove, replace, reconstruct, repair, move, keep, use and/or operate one pipeline for the transmission of Pipeline quality natural gas as defined in The Ontario Energy Board Act S.O. 1998 (hereinafter called the "Pipeline") including therewith all such buried attachments, equipment and appliances for cathodic protection which the Transferee may deem necessary or convenient thereto, together with the right of ingress and egress at any and all times over and upon the Lands for its servants, agents, employees, those engaged in its business, contractors and subcontractors on foot and/or with vehicles, supplies, machinery and equipment for all purposes necessary or incidental to the exercise and enjoyment of the rights, liberty, privileges and easement hereby granted. The Parties hereto mutually covenant and agree each with the other as follows:

1. In consideration of the sum of **TWO Dollars** (\$2.00) of lawful money of Canada (hereinafter called the "Consideration"), which sum is payment in full for the rights and interest hereby granted and for the rights and interest, if any, acquired by the Transferee by expropriation, including in either or both cases payment in full for all such matters as injurious affection to remaining lands and the effect, if any, of registration on title of this document and where applicable, of the expropriation documents, subject to Clause 12 hereof to be paid by the Transferee to the Transferor within 90 days from the date of these presents or prior to the exercise by the Transferee of any of its rights hereunder other than the right to survey (whichever may be the earlier date), the rights, privileges and easement hereby granted shall continue in perpetuity or until the Transferee, with the express written consent of the Transferor, shall execute and deliver a surrender thereof. Prior to such surrender, the Transferee shall remove all debris as may have resulted from the Transferee's use of the Lands from the Lands and in all respects restore the Lands to its previous productivity and fertility so far as is reasonably possible, save and except for items in respect of which compensation is due under Clause 2, hereof. Transferor and Transferee hereby agree that nothing herein shall oblige Transferee to remove the Pipeline from the Lands as part of Transferee's obligation to restore the Lands.
2. The Transferee shall make to the Transferor (or the person or persons entitled thereto) due compensation for any damages to the Lands resulting from the exercise of any of the rights herein granted, and if the compensation is not agreed upon by the Transferee and the Transferor, it shall be determined by arbitration in the manner prescribed by the Expropriations Act, R.S.O. 1990, Chapter E-26 or any Act passed in amendment thereof or substitution therefore. Any gates, fences and tile drains curbs, gutters, asphalt paving, lockstone, patio tiles interfered with by the Transferee shall be restored by the Transferee at its expense as closely as reasonably possible to the condition and function in which they existed immediately prior to such interference by the Transferee and in

the case of tile drains, such restoration shall be performed in accordance with good drainage practice and applicable government regulations.

3. The Pipeline (including attachments, equipment and appliances for cathodic protection but excluding valves, take-offs and fencing installed under Clause 9 hereof) shall be laid to such a depth that upon completion of installation it will not obstruct the natural surface run-off from the Lands nor ordinary cultivation of the Lands nor any tile drainage system existing in the Lands at the time of installation of the Pipeline nor any planned tile drainage system to be laid in the Lands in accordance with standard drainage practice, if the Transferee is given at least thirty (30) days notice of such planned system prior to the installation of the Pipeline; provided that the Transferee may leave the Pipeline exposed in crossing a ditch, stream, gorge or similar object where approval has been obtained from the Ontario Energy Board or other Provincial Board or authority having jurisdiction in the premises. The Transferee agrees to make reasonable efforts to accommodate the planning and installation of future tile drainage systems following installation of the Pipeline so as not to obstruct or interfere with such tile installation.
4. As soon as reasonably possible after the construction of the Pipeline, the Transferee shall level the Lands and unless otherwise agreed to by the Transferor, shall remove all debris as may have resulted from the Transferee's use of the Lands therefrom and in all respects restore the Lands to its previous productivity and fertility so far as is reasonably possible, save and except for items in respect of which compensation is due under Clause 2 hereof.
5. It is further agreed that the Transferee shall assume all liability and obligations for any and all loss, damage or injury, (including death) to persons or property that would not have happened but for this Easement or anything done or maintained by the Transferee hereunder or intended so to be and the Transferee shall at all times indemnify and save harmless the Transferor from and against all such loss, damage or injury and all actions, suits, proceedings, costs, charges, damages, expenses, claims or demands arising therefrom or connected therewith provided that the Transferee shall not be liable under the clause to the extent to which such loss, damage or injury is caused or contributed to by the gross negligence or wilful misconduct of the Transferor.
6. In the event that the Transferee fails to comply with any of the requirements set out in Clauses 2, 3, or 4 hereof within a reasonable time of the receipt of notice in writing from the Transferor setting forth the failure complained of, the Transferee shall compensate the Transferor (or the person or persons entitled thereto) for any damage, if any, necessarily resulting from such failure and the reasonable costs if any, incurred in the recovery of those damages.
7. Except in case of emergency, the Transferee shall not enter upon any of the Transferor's Lands, other than the Lands, without the consent of the Transferor. In case of emergency the right of entry upon the Transferor's Lands for ingress and egress to and from the Lands is hereby granted. The determination of what circumstances constitute an emergency, for purposes of this paragraph is within the absolute discretion of the Transferee, but is a situation in which the Transferee has a need to access the Pipeline in the public interest without notice to the Transferor, subject to the provisions of Clause 2 herein. The Transferee will, within 72 hours of entry upon such lands, advise the Transferor of the said emergency circumstances and thereafter provide a written report to Transferor with respect to the resolution of the emergency situation. The Transferee shall restore the lands of the Transferor at its expense as closely as reasonably practicable to the condition in which they existed immediately prior to such interference by the Transferee and in the case of tile drains, such restoration shall be performed in accordance with good drainage practice.
8. The Transferor shall have the right to fully use and enjoy the Lands except for planting trees over the lesser of the Lands or a six (6) metre strip centered over the Pipeline, and except as may be necessary for any of the purposes hereby granted to the Transferee, provided that without the prior written consent of the Transferee, the Transferor shall not excavate, drill, install, erect or permit to be excavated, drilled, installed or erected in, on, over or through the Lands any pit, well, foundation, pavement, building, mobile homes or other structure or installation. Notwithstanding the foregoing the Transferee upon request shall consent to the Transferor erecting or repairing fences, hedges, pavement, lockstone constructing or repairing tile drains and domestic sewer pipes, water pipes, and utility pipes and constructing or repairing lanes, roads, driveways, pathways, and walks across, on and in the Lands or any portion or portions thereof, provided that before commencing any of the work referred to in this sentence the Transferor shall (a) give the Transferee at least (30) clear days notice in writing describing the work desired so as to enable the Transferee to evaluate and comment on the work proposed and to have a representative inspect the site and/or be present at any time or times during the performance of the work, (b) shall follow the instructions of such representative as to the performance of such work without damage to the Pipeline, (c) shall

exercise a high degree of care in carrying out any such work and, (d) shall perform any such work in such a manner as not to endanger or damage the Pipeline as may be required by the Transferee.

9. The rights, privileges and easement herein granted shall include the right to install, keep, use, operate, service, maintain, repair, remove and/or replace in, on and above the Lands any valves and/or take-offs subject to additional agreements and to fence in such valves and/or take-offs and to keep same fenced in, but for this right the Transferee shall pay to the Transferor (or the person or persons entitled thereto) such additional compensation as may be agreed upon and in default of agreement as may be settled by arbitration under the provisions of The Ontario Energy Board Act, S.O. 1998, or any Act passed in amendment thereof or substitution therefore. The Transferee shall keep down weeds on any lands removed from cultivation by reason of locating any valves and/or take-offs in the Lands.
10. Notwithstanding any rule of law or equity and even though the Pipeline and its appurtenances may become annexed or affixed to the realty, title thereto shall nevertheless remain in the Transferee.
11. Neither this Agreement nor anything herein contained nor anything done hereunder shall affect or prejudice the Transferee's rights to acquire the Lands or any other portion or portions of the Transferor's lands under the provisions of The Ontario Energy Board Act, S.O. 1998, or any other laws, which rights the Transferee may exercise at its discretion in the event of the Transferor being unable or unwilling for any reason to perform this Agreement or give to the Transferee a clear and unencumbered title to the easement herein granted.
12. The Transferor covenants that he has the right to convey this Easement notwithstanding any act on his part, that he will execute such further assurances of this Easement as may be requisite and which the Transferee may at its expense prepare and that the Transferee, performing and observing the covenants and conditions on its part to be performed, shall have quiet possession and enjoyment of the rights, privileges and easement hereby granted. If it shall appear that at the date hereof the Transferor is not the sole owner of the Lands, this Easement shall nevertheless bind the Transferor to the full extent of his interest therein and shall also extend to any after-acquired interest, but all moneys payable hereunder shall be paid to the Transferor only in the proportion that his interest in the Lands bears to the entire interest therein.
13. In the event that the Transferee fails to pay the consideration as hereinbefore provided, the Transferor shall have the right to declare this Easement cancelled after the expiration of 15 days from personal service upon the Manager, Land Services of the Transferee at its Executive Head Office in Chatham, Ontario, (or at such other point in Ontario as the Transferee may from time to time specify by notice in writing to the Transferor) of notice in writing of such default, unless during such 15 day period the Transferee shall pay the said consideration; upon failing to pay as aforesaid, the Transferee shall forthwith after the expiration of 15 days from the service of such notice execute and deliver to the Transferor at the expense of the Transferee, a valid and registrable release and discharge of this Easement.
14. All payments under these presents may be made either in cash or by cheque of the Transferee and may be made to the Transferor (or person or persons entitled thereto) either personally or by mail. All notices and mail sent pursuant to these presents shall be addressed to:

the Transferor at:

and to the Transferee at: Union Gas Limited
P.O. Box 2001
50 Keil Drive North
Chatham, Ontario N7M 5M1
Attention: Manager, Land Services

or to such other address in either case as the Transferor or the Transferee respectively may from time to time appoint in writing.

15. The rights, privileges and easement hereby granted are and shall be of the same force and effect as a covenant running with the Transferor's Land and this Easement, including all the covenants and conditions herein contained, shall extend to, be binding upon and inure to the benefit of the heirs, executors, administrators, successors and assigns of the Parties hereto respectively; and, wherever the singular or masculine is used it shall, where necessary, be construed as if the plural, or feminine or neuter had been used, as the case may be.

16. (a) The Transferee represents that it is registered for the purposes of the Harmonized Goods and Services Tax (hereinafter called "HST") in accordance with the applicable provisions in that regard and pursuant to the Excise Tax Act, (R.S.C., 1985, c. E-15), (hereinafter called "Excise Tax Act"), as amended.
- (b) The Transferee covenants to deliver a Statutory Declaration, Undertaking and Indemnity confirming its HST registration number, which shall be conclusive evidence of such HST registration, and shall preclude the Transferor from collection of HST from the Transferee.
- (c) The Transferee shall undertake to self-assess the HST payable in respect of this transaction pursuant to subparagraphs 221(2) and 228(4) of the Excise Tax Act, and to remit and file a return in respect of HST owing as required under the said Act for the reporting period in which the HST in this transaction became payable.
- (d) The Transferee shall indemnify and save harmless the Transferor from and against any and all claims, liabilities, penalties, interest, costs and other legal expenses incurred, directly or indirectly, in connection with the assessment of HST payable in respect of the transaction contemplated by this Easement. The Transferee's obligations under this Clause shall survive this Easement.
17. The Transferor hereby acknowledges that this Easement will be registered electronically.

DATED this day of Choose an item. 20

Signature (Transferor)
Insert name here
Print Name(s) (and position held if applicable)
Choose an item.
Enter Text here
Address (Transferor)

Signature (Transferor)
Insert name here
Print Name(s) (and position held if applicable)
Choose an item.
Enter Text here
Address (Transferor)

UNION GAS LIMITED

Signature (Transferee)
Insert name here, Choose an item.
Name & Title (Union Gas Limited)
I have authority to bind the Corporation.
Telephone Number (Union Gas Limited)

Municipality of Chatham-Kent

Province of Ontario

DECLARATION REQUIRED UNDER
SECTION [Choose an item.](#) OF THE PLANNING
ACT, R.S.O. 1990, as amended

I, [Click here to enter text.](#) , of the [Click here to enter text.](#), in the Province of Ontario.

DO SOLEMNLY DECLARE THAT

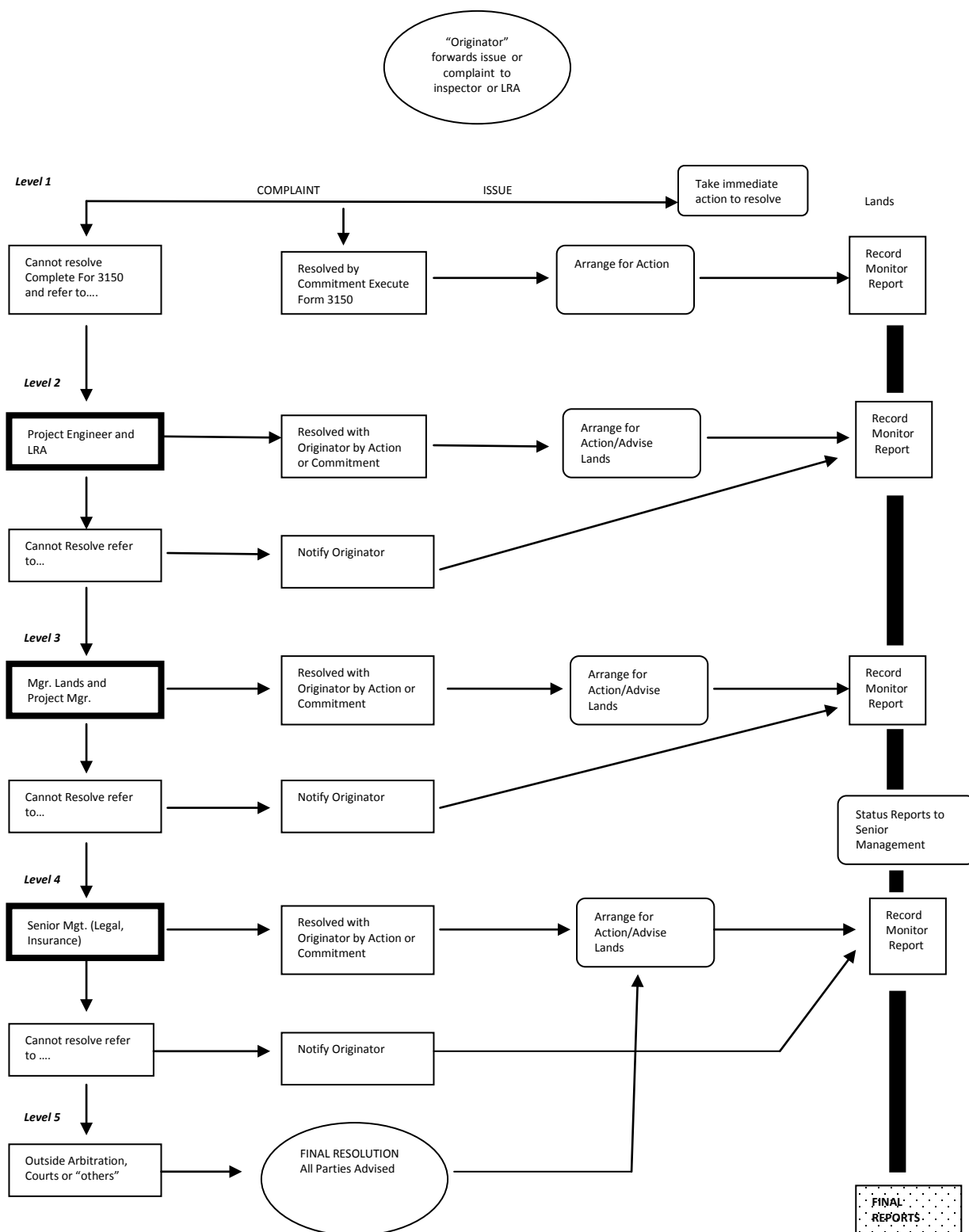
1. I am a Manager, Land Services, Lands Department of Union Gas Limited, the Transferee in the attached Grant of Easement and as such have knowledge of the matters herein deposed to.
2. The use of or right in the land described in the said Grant of Easement is being acquired by Union Gas Limited for the purpose of a [Choose an item.](#) line within the meaning of Part VI of the Ontario Energy Board Act, 1998.

AND I make this solemn declaration conscientiously believing it to be true and knowing that it is of the same force and effect as if made under oath, and by virtue of The Canada Evidence Act.

DECLARED before me at the
[Click here to enter text.](#),
in the Province of Ontario

This day of [Choose an item.](#) 20

A Commissioner, etc.



1. "originator" of complaint or issue may be landowner or company representative
2. Parties indicated in heavy outlined boxes shall assume responsibility for actions subsequently required in the resolution process. Parties identified in brackets may only be required for resolution or specific technical concerns
3. "L.R.A." refers to Landowner Relations Agent

LANDOWNER COMPLAINT RESOLUTION SYSTEM EXPLANATION OF PROCESS CHART

Key Definitions

Originator – The originator of a complaint or issue is the landowner or Union Gas personnel who initiates a complaint or issue by making it known to the Landowner Relations Agent or a company inspector.

Landowner Relations Agent (LRA) – A person assigned on a full time or part time basis to record, monitor, and ensure follow-up on any complaint or issue received by Union related to construction, to address questions and concerns of the landowners, and to act as a liaison between landowners and the contractor and engineering personnel.

Issue – A concern of a landowner which can be resolved within three (3) working days. Immediate action is taken to resolve such matters.

Complaint – A concern of a landowner which cannot be resolved within three (3) working days.

Commitment – If an issue or complaint is resolved at any level of the Complaint Resolution system through the efforts and liaison activities of the Landowner Relations Agent or other personnel, the resolution is recorded to ensure proper future follow-up.

Outside Arbitration – includes the Board of Negotiation, O.M.B., and O.E.B.

Others – refers to other regulatory bodies and tribunals

Levels of the Complaint Resolution System

Level 1: The LRA or company inspector receives issues or complaints, and the following can happen:

- a) Immediate action could be arranged by the LRA or inspector to resolve the issue or complaint; or
- b) A complaint can be resolved by a commitment in which case the LRA is responsible for arranging for the committed action and having the commitment recorded in the Complaint Resolution system; or
- c) If a complaint cannot be resolved through the efforts of the LRA or inspector, the applicable form (Form 3150) is completed and then recorded, and the complaint is referred to **Level 2**.

Level 2: The LRA and the Construction Supervisor work together to develop a resolution for the complaint, and the following can happen:

- a) the complaint may be resolved with the originator by action or commitment and the action or commitment is recorded in the Complaint Resolution System; or
- b) if the complaint cannot be resolved, the originator is notified, the non-resolution is recorded, and the complaint is referred to **Level 3**.

Level 3: The Manager, Lands and the Project Manager work together to develop a resolution for the complaint, and the following can happen:

- a) complaint may be resolved with the originator by action or commitment and the action or commitment is recorded in the Complaint Resolution System; or
- b) if the complaint cannot be resolved, the originator is notified, the non-resolution is recorded, and the complaint is referred to **Level 4**;

When complaints reach this level, status reports are generated through the Complaint Resolution System and are forwarded to Senior Management.

Level 4: Senior Management (with possible input from the Legal and Risk and Claims Departments) attempts to develop a resolution to the complaint, and the following can happen:

- a) the complaint may be resolved with the originator by action or commitment and the action or commitment is recorded in the Complaint Resolution System; or
- b) if the complaint cannot be resolved, the originator is notified, the non-resolution is recorded, and the complaint is referred to **Level 5**;

Level 5: Involves the resolution of a complaint by outside arbitration or others, and the following will happen:

A final resolution will occur, all parties will be advised, and any action required will be arranged by the LRA or other Lands Department personnel.

Note: the Complaint Resolution System is used to generate final reports to the Ontario Energy Board

Bechard, Shelley

From: Bonin, John
Sent: February-26-14 3:10 PM
To: Chief Tom Bressette
Subject: Payne to Sarnia Project
Attachments: 160960889_ProposedRoutes.pdf

Good afternoon Chief Bressette!

I would like to share some information with you on a proposed Union Gas pipeline project.

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas in the greater Sarnia area, Union Gas is proposing to construct 4.9 km's of 24-inch diameter steel pipeline between our existing facilities east of Ladysmith Road (between Rokeby Line and Moore Line in Lambton County) and south of Rokeby Line (between Highway 40 and Baby Creek). A map of the study area and proposed running line is attached.

We are committed to minimizing the effects of our projects and operations on the environment. Union Gas has retained an independent environmental consultant to undertake an environmental study of the construction and operation of the proposed pipeline.

It is anticipated that the Environmental Report for the study will be completed in the spring of 2014 at which time Union Gas will file an application for the proposed pipeline to the OEB. If approved, construction of the pipeline could begin in the spring of 2015. This study will include consultation with First Nations and the Métis Nation, municipalities, landowners, government agencies, and others. There will be a public information session held on **March 11 between 4-7pm**, at **Mooretown Sports Complex** located at 1166 Emily Street, Mooretown, ON

As part of these efforts, we are committed to our long-standing practice of meaningful consultation and engagement with First Nations and the Métis Nation communities and recognize your community's close relationship with the land and the environment.

I would be happy to arrange a time to meet with you to review the project in more detail. In the interim, should you have any questions, please do not hesitate to contact me. During the Environmental review process, we will be contacting you regarding the Environmental and Archeology surveys to provide Monitors during the surveys!

Thanks in advance for your review of this information!

John Bonin

Manager First Nations and Métis Affairs

Union Gas

Phone: 519-539-8509 ext 5021063

Email: jbonin@uniongas.com

Bechard, Shelley

From: Bonin, John
Sent: February-26-14 3:06 PM
To: Chief Louise Hillier
Subject: Payne to Sarnia Project
Attachments: 160960889_ProposedRoutes.pdf

Good afternoon Chief Hillier!

I would like to share some information with you on a proposed Union Gas pipeline project.

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas in the greater Sarnia area, Union Gas is proposing to construct 4.9 km's of 24-inch diameter steel pipeline between our existing facilities east of Ladysmith Road (between Rokeby Line and Moore Line in Lambton County) and south of Rokeby Line (between Highway 40 and Baby Creek). A map of the study area and proposed running line is attached.

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John Bonin

Manager First Nations and Métis Affairs

Union Gas

Phone: 519-539-8509 ext 5021063

Email: jbonin@uniongas.com

Bechard, Shelley

From: Bonin, John
Sent: February-26-14 2:53 PM
To: Chief Joe Miskokomon
Subject: Payne to Sarnia Project
Attachments: 160960889_ProposedRoutes.pdf

Good afternoon morning Chief Miskokomon!

I would like to share some information with you on a proposed Union Gas pipeline project.

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas in the greater Sarnia area, Union Gas is proposing to construct 4.9 km's of 24-inch diameter steel pipeline between our existing facilities east of Ladysmith Road (between Rokeby Line and Moore Line in Lambton County) and south of Rokeby Line (between Highway 40 and Baby Creek). A map of the study area and proposed running line is attached.

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Thanks in advance for your review of this information!

John Bonin

Manager First Nations and Métis Affairs

Union Gas

Phone: 519-539-8509 ext 5021063

Email: jbonin@uniongas.com

Bechard, Shelley

From: Bonin, John
Sent: February-26-14 3:18 PM
To: Joanne Meyer
Subject: Payne to Sarnia Project
Attachments: 160960889_ProposedRoutes.pdf

Good afternoon Joanne!

I would like to share some information with you on a proposed Union Gas pipeline project.

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas in the greater Sarnia area, Union Gas is proposing to construct 4.9 km's of 24-inch diameter steel pipeline between our existing facilities east of Ladysmith Road (between Rokeby Line and Moore Line in Lambton County) and south of Rokeby Line (between Highway 40 and Baby Creek). A map of the study area and proposed running line is attached.

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Thanks in advance for your review of this information!

John Bonin

Manager First Nations and Métis Affairs

Union Gas

Phone: 519-539-8509 ext 5021063

Email: jbonin@uniongas.com

Bechard, Shelley

From: Bonin, John
Sent: February-26-14 3:14 PM
To: Chief Burton Kewayosh; Dean Jacobs
Subject: Payne to Sarnia Project
Attachments: 160960889_ProposedRoutes.pdf

Good afternoon Chief Kewayosh and Dean!

I would like to share some information with you on a proposed Union Gas pipeline project.

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas in the greater Sarnia area, Union Gas is proposing to construct 4.9 km's of 24-inch diameter steel pipeline between our existing facilities east of Ladysmith Road (between Rokeby Line and Moore Line in Lambton County) and south of Rokeby Line (between Highway 40 and Baby Creek). A map of the study area and proposed running line is attached.

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Thanks in advance for your review of this information!

John Bonin

Manager First Nations and Métis Affairs

Union Gas

Phone: 519-539-8509 ext 5021063

Email: jbonin@uniongas.com

Bechard, Shelley

From: Bonin, John
Sent: March-03-14 6:04 AM
To: Louise Hillier
Subject: RE: Payne to Sarnia Project

Thanks for your response Chief Hillier and I will ensure you are kept up to date on this project as it moves forward!

John

From: Louise Hillier [<mailto:cfnchief@live.com>]
Sent: March-01-14 4:57 PM
To: Bonin, John
Subject: RE: Payne to Sarnia Project

Thanks John!

I am not sure if we will be able to attend the information session on March 11th and if not, we would appreciate an update on the information gathered. Please keep us posted on developments with this project.

Thanks again and have a wonderful week-end!

Chief Hillier

From: JBonin@uniongas.com
To: cfnchief@live.com
Subject: Payne to Sarnia Project
Date: Wed, 26 Feb 2014 20:06:19 +0000

Good afternoon Chief Hillier!

I would like to share some information with you on a proposed Union Gas pipeline project.

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas in the greater Sarnia area, Union Gas is proposing to construct 4.9 km's of 24-inch diameter steel pipeline between our existing facilities east of Ladysmith Road (between Rokeby Line and Moore Line in Lambton County) and south of Rokeby Line (between Highway 40 and Baby Creek). A map of the study area and proposed running line is attached.

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There will be a public information session held on **March 11 between 4-7pm**, at **Mooretown Sports Complex** located at 1166 Emily Street, Mooretown, ON

As part of these efforts, we are committed to our long-standing practice of meaningful consultation and engagement with First Nations and the Métis Nation communities and recognize your community's close relationship with the land and the environment.

I would be happy to arrange a time to meet with you to review the project in more detail. In the interim, should you have any questions, please do not hesitate to contact me. During the Environmental review process, we will be contacting you regarding the Environmental and Archeology surveys to provide Monitors during the surveys!

Thanks in advance for your review of this information!

John Bonin

Manager First Nations and Métis Affairs

Union Gas

Phone: 519-539-8509 ext 5021063

Email: jbbonin@uniongas.com

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Bechard, Shelley

From: Bonin, John
Sent: February-26-14 3:03 PM
To: Chief Chris Plain; Sharilyn Johnston
Subject: Payne to Sarnia Project
Attachments: 160960889_ProposedRoutes.pdf

Good afternoon Chief Plain and Sharilyn!

I would like to share some information with you on a proposed Union Gas pipeline project.

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas in the greater Sarnia area, Union Gas is proposing to construct 4.9 km's of 24-inch diameter steel pipeline between our existing facilities east of Ladysmith Road (between Rokeby Line and Moore Line in Lambton County) and south of Rokeby Line (between Highway 40 and Baby Creek). A map of the study area and proposed running line is attached.

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Thanks in advance for your review of this information!

John Bonin

Manager First Nations and Métis Affairs

Union Gas

Phone: 519-539-8509 ext 5021063

Email: jbonin@uniongas.com

February 27, 2014
File: 160960892

Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, ON N7T 7H5

Attention: Chief Christopher Plain

Dear Chief Plain,

Reference: Union Gas Ltd. – Initiation of Environmental Study and Notice of Information Session for the Payne Sarnia Pipeline Project

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas, Union Gas is proposing to construct a natural gas pipeline. The proposed project includes construction of approximately 5 kms of 24-inch (610 mm) diameter steel natural gas pipeline. The pipeline would commence at Union Gas's existing Payne storage pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. A map of the preferred route is included in the attached notice.

Union Gas is committed to minimizing the effects of their projects and operations on the environment. As an integral part of this project, Union Gas has hired Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the natural gas pipeline. The environmental study will fulfill the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)*.

The environmental study process will include consultation and engagement with landowners, municipalities, government agencies, First Nations, the Métis Nation of Ontario and other interested parties through mail outs, meetings and an Information Session, which will be held on March 11, 2014 and will be instrumental in the completion of the environmental study process. The details of the information session or shown on the attached notice. An Environmental Report will accompany the Union Gas application to the OEB, whose review and approval is needed before this project can proceed. If approved, construction could begin as early as the spring of 2015.

Aamjiwnaang First Nation is invited to provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the project may have

on constitutionally protected aboriginal or treaty rights and any measures for mitigating those adverse impacts.

Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory. Information regarding other proposed developments is also requested to be provided, for incorporation into the environmental study as a component of a cumulative effects assessment.

For any questions or concerns regarding the project please do not hesitate to contact the undersigned.

Sincerely,

John Bonin

John Bonin
Manager First Nations and Métis Affairs
Union Gas
Box 5353 Station A
109 Commissioners Rd
London Ont. N6A 4P1
Phone: 519-539-8509 ext. 5021063
Email: jbonin@uniongas.com

Attachment: Initiation of Environmental Study and Information Session

c. Steve Thurtell, Stantec Consulting Ltd.

February 27, 2014
File: 160960892

Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, ON N7T 7H5

Attention: Ms. Shelley Raymond

Dear Ms. Raymond,

Reference: Union Gas Ltd. – Initiation of Environmental Study and Notice of Information Session for the Payne Sarnia Pipeline Project

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas, Union Gas is proposing to construct a natural gas pipeline. The proposed project includes construction of approximately 5 kms of 24-inch (610 mm) diameter steel natural gas pipeline. The pipeline would commence at Union Gas's existing Payne storage pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. A map of the preferred route is included in the attached notice.

Union Gas is committed to minimizing the effects of their projects and operations on the environment. As an integral part of this project, Union Gas has hired Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the natural gas pipeline. The environmental study will fulfill the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)*.

The environmental study process will include consultation and engagement with landowners, municipalities, government agencies, First Nations, the Métis Nation of Ontario and other interested parties through mail outs, meetings and an Information Session, which will be held on March 11, 2014 and will be instrumental in the completion of the environmental study process. The details of the information session or shown on the attached notice. An Environmental Report will accompany the Union Gas application to the OEB, whose review and approval is needed before this project can proceed. If approved, construction could begin as early as the spring of 2015.

Aamjiwnaang First Nation is invited to provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the project may have

on constitutionally protected aboriginal or treaty rights and any measures for mitigating those adverse impacts.

Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory. Information regarding other proposed developments is also requested to be provided, for incorporation into the environmental study as a component of a cumulative effects assessment.

For any questions or concerns regarding the project please do not hesitate to contact the undersigned.

Sincerely,

John Bonin

John Bonin
Manager First Nations and Métis Affairs
Union Gas
Box 5353 Station A
109 Commissioners Rd
London Ont. N6A 4P1
Phone: 519-539-8509 ext. 5021063
Email: jbonin@uniongas.com

Attachment: Initiation of Environmental Study and Information Session

c. Steve Thurtell, Stantec Consulting Ltd.

February 27, 2014
File: 160960892

Aamjiwnaang First Nation
978 Tashmoo Avenue
Sarnia, ON N7T 7H5

Attention: Ms. Sharilyn Johnston

Dear Ms. Johnston,

Reference: Union Gas Ltd. – Initiation of Environmental Study and Notice of Information Session for the Payne Sarnia Pipeline Project

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas, Union Gas is proposing to construct a natural gas pipeline. The proposed project includes construction of approximately 5 kms of 24-inch (610 mm) diameter steel natural gas pipeline. The pipeline would commence at Union Gas's existing Payne storage pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. A map of the preferred route is included in the attached notice.

Union Gas is committed to minimizing the effects of their projects and operations on the environment. As an integral part of this project, Union Gas has hired Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the natural gas pipeline. The environmental study will fulfill the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)*.

The environmental study process will include consultation and engagement with landowners, municipalities, government agencies, First Nations, the Métis Nation of Ontario and other interested parties through mail outs, meetings and an Information Session, which will be held on March 11, 2014 and will be instrumental in the completion of the environmental study process. The details of the information session or shown on the attached notice. An Environmental Report will accompany the Union Gas application to the OEB, whose review and approval is needed before this project can proceed. If approved, construction could begin as early as the spring of 2015.

Aamjiwnaang First Nation is invited to provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the project may have

on constitutionally protected aboriginal or treaty rights and any measures for mitigating those adverse impacts.

Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory. Information regarding other proposed developments is also requested to be provided, for incorporation into the environmental study as a component of a cumulative effects assessment.

For any questions or concerns regarding the project please do not hesitate to contact the undersigned.

Sincerely,

John Bonin

John Bonin
Manager First Nations and Métis Affairs
Union Gas
Box 5353 Station A
109 Commissioners Rd
London Ont. N6A 4P1
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Attachment: Initiation of Environmental Study and Information Session

c. Steve Thurtell, Stantec Consulting Ltd.

February 27, 2014
File: 160960892

Caldwell First Nation
14 Orange Street – PO Box 388
Leamington, ON N8H 3W3

Attention: Chief Louise Hillier

Dear Chief Hillier,

Reference: Union Gas Ltd. – Initiation of Environmental Study and Notice of Information Session for the Payne Sarnia Pipeline Project

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas, Union Gas is proposing to construct a natural gas pipeline. The proposed project includes construction of approximately 5 kms of 24-inch (610 mm) diameter steel natural gas pipeline. The pipeline would commence at Union Gas's existing Payne storage pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. A map of the preferred route is included in the attached notice.

Union Gas is committed to minimizing the effects of their projects and operations on the environment. As an integral part of this project, Union Gas has hired Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the natural gas pipeline. The environmental study will fulfill the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)*.

The environmental study process will include consultation and engagement with landowners, municipalities, government agencies, First Nations, the Métis Nation of Ontario and other interested parties through mail outs, meetings and an Information Session, which will be held on March 11, 2014 and will be instrumental in the completion of the environmental study process. The details of the information session or shown on the attached notice. An Environmental Report will accompany the Union Gas application to the OEB, whose review and approval is needed before this project can proceed. If approved, construction could begin as early as the spring of 2015.

Caldwell First Nation is invited to provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the project may have on

constitutionally protected aboriginal or treaty rights and any measures for mitigating those adverse impacts.

Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory. Information regarding other proposed developments is also requested to be provided, for incorporation into the environmental study as a component of a cumulative effects assessment.

For any questions or concerns regarding the project please do not hesitate to contact the undersigned.

Sincerely,

John Bonin

John Bonin
Manager First Nations and Métis Affairs
Union Gas
Box 5353 Station A
109 Commissioners Rd
London Ont. N6A 4P1
Phone: 519-539-8509 ext. 5021063
Email: jbonin@uniongas.com

Attachment: Initiation of Environmental Study and Information Session

c. Steve Thurtell, Stantec Consulting Ltd.

February 27, 2014
File: 160960892

Chippewas of Kettle and Stony Point
6247 Indian Lane – RR2
Forest, ON N0N 1J0

Attention: Chief Thomas Bressette

Dear Chief Bressette,

Reference: Union Gas Ltd. – Initiation of Environmental Study and Notice of Information Session for the Payne Sarnia Pipeline Project

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas, Union Gas is proposing to construct a natural gas pipeline. The proposed project includes construction of approximately 5 kms of 24-inch (610 mm) diameter steel natural gas pipeline. The pipeline would commence at Union Gas's existing Payne storage pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. A map of the preferred route is included in the attached notice.

Union Gas is committed to minimizing the effects of their projects and operations on the environment. As an integral part of this project, Union Gas has hired Stantec Consulting Ltd. (Stantec) to undertake an environmental study of the construction and operation of the natural gas pipeline. The environmental study will fulfill the requirements of the Ontario Energy Board's (OEB) *Environmental Guidelines for the Location, Construction and Operation of Hydrocarbon Pipelines and Facilities in Ontario (2011)*.

The environmental study process will include consultation and engagement with landowners, municipalities, government agencies, First Nations, the Métis Nation of Ontario and other interested parties through mail outs, meetings and an Information Session, which will be held on March 11, 2014 and will be instrumental in the completion of the environmental study process. The details of the information session or shown on the attached notice. An Environmental Report will accompany the Union Gas application to the OEB, whose review and approval is needed before this project can proceed. If approved, construction could begin as early as the spring of 2015.

Chippewas of Kettle and Stony Point is invited to provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the project

may have on constitutionally protected aboriginal or treaty rights and any measures for mitigating those adverse impacts.

Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory. Information regarding other proposed developments is also requested to be provided, for incorporation into the environmental study as a component of a cumulative effects assessment.

For any questions or concerns regarding the project please do not hesitate to contact the undersigned.

Sincerely,

John Bonin

John Bonin
Manager First Nations and Métis Affairs
Union Gas
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109 Commissioners Rd
London Ont. N6A 4P1
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Email: jbonin@uniongas.com

Attachment: Initiation of Environmental Study and Information Session

c. Steve Thurtell, Stantec Consulting Ltd.

February 27, 2014
File: 160960892

Chippewas of the Thames
320 Chippewa Road – RR1
Muncey, ON N0L 1Y0

Attention: Chief Joe Miskokomon

Dear Chief Miskokomon,

Reference: Union Gas Ltd. – Initiation of Environmental Study and Notice of Information Session for the Payne Sarnia Pipeline Project

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas, Union Gas is proposing to construct a natural gas pipeline. The proposed project includes construction of approximately 5 kms of 24-inch (610 mm) diameter steel natural gas pipeline. The pipeline would commence at Union Gas's existing Payne storage pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. A map of the preferred route is included in the attached notice.

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Chippewas of the Thames is invited to provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the project may have

on constitutionally protected aboriginal or treaty rights and any measures for mitigating those adverse impacts.

Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory. Information regarding other proposed developments is also requested to be provided, for incorporation into the environmental study as a component of a cumulative effects assessment.

For any questions or concerns regarding the project please do not hesitate to contact the undersigned.

Sincerely,

John Bonin

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Email: jbonin@uniongas.com

Attachment: Initiation of Environmental Study and Information Session

c. Steve Thurtell, Stantec Consulting Ltd.

February 27, 2014
File: 160960892

Métis Nation of Ontario
500 Old St. Patrick Street, Unit 3
Ottawa, ON K1N 9G4

Attention: Ms. Joanne Meyer

Dear Ms. Meyer,

Reference: Union Gas Ltd. – Initiation of Environmental Study and Notice of Information Session for the Payne Sarnia Pipeline Project

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas, Union Gas is proposing to construct a natural gas pipeline. The proposed project includes construction of approximately 5 kms of 24-inch (610 mm) diameter steel natural gas pipeline. The pipeline would commence at Union Gas's existing Payne storage pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. A map of the preferred route is included in the attached notice.

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Métis Nation of Ontario is invited to provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the project may have

on constitutionally protected aboriginal or treaty rights and any measures for mitigating those adverse impacts.

Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory. Information regarding other proposed developments is also requested to be provided, for incorporation into the environmental study as a component of a cumulative effects assessment.

For any questions or concerns regarding the project please do not hesitate to contact the undersigned.

Sincerely,

John Bonin

John Bonin
Manager First Nations and Métis Affairs
Union Gas
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Email: jbonin@uniongas.com

Attachment: Initiation of Environmental Study and Information Session

c. Steve Thurtell, Stantec Consulting Ltd.

February 27, 2014
File: 160960892

Walpole Island First Nation
117 Tahgahoning Road – RR3
Wallaceburg, ON N8A 4K9

Attention: Chief Burton Kewayosh

Dear Chief Kewayosh,

Reference: Union Gas Ltd. – Initiation of Environmental Study and Notice of Information Session for the Payne Sarnia Pipeline Project

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas, Union Gas is proposing to construct a natural gas pipeline. The proposed project includes construction of approximately 5 kms of 24-inch (610 mm) diameter steel natural gas pipeline. The pipeline would commence at Union Gas's existing Payne storage pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. A map of the preferred route is included in the attached notice.

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Walpole Island First Nation is invited to provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the project may have

on constitutionally protected aboriginal or treaty rights and any measures for mitigating those adverse impacts.

Stantec is also seeking background environmental and socio-economic information that may be useful in compiling an inventory. Information regarding other proposed developments is also requested to be provided, for incorporation into the environmental study as a component of a cumulative effects assessment.

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Attachment: Initiation of Environmental Study and Information Session

c. Steve Thurtell, Stantec Consulting Ltd.

February 27, 2014
File: 160960892

Walpole Island First Nation
117 Tahgahoning Road – RR3
Wallaceburg, ON N8A 4K9

Attention: Mr. Dean Jacobs

Dear Mr. Jacobs,

Reference: Union Gas Ltd. – Initiation of Environmental Study and Notice of Information Session for the Payne Sarnia Pipeline Project

To secure the continued reliable delivery of natural gas and serve a growing demand for clean, affordable natural gas, Union Gas is proposing to construct a natural gas pipeline. The proposed project includes construction of approximately 5 kms of 24-inch (610 mm) diameter steel natural gas pipeline. The pipeline would commence at Union Gas's existing Payne storage pool on Ladysmith Road between Rokeby Line and Moore Line in Lambton County, Ontario. The proposed endpoint is along Union Gas's existing Sarnia system south of Rokeby Line between Highway 40 and Baby Creek. A map of the preferred route is included in the attached notice.

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Walpole Island First Nation is invited to provide comments regarding the proposed project. Specifically, Stantec is seeking information about any adverse impacts that the project may have

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