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A Spectra Energy Company

March 27, 2009

BY RESS & Courier

Ms. Kirsten Walli  
Board Secretary  
Ontario Energy Board  
Suite 2700, 2300 Yonge Street  
Toronto, Ontario  
M4P 1E4

Dear Ms. Walli:

**Re: Union Gas Limited  
Heritage Pool  
Board File # EB-2008-0405**

Please find attached two copies of Union's responses to the Board's Technical Conference questions.

As well, please find attached Presentation which will form part of the Technical Conference on Tuesday, March 31, 2009.

As a further attachment, enclosed is the updated OPCC Summary of Comments which is shown as Section 5 – Schedule 2 of our pre-filed evidence.

Sincerely,

Mary Jane Patrick  
Regulatory Analyst, Regulatory Projects  
:mjp  
Encl.

cc: Neil McKay, Manager Facilities Applications ([neil.mckay@oeb.gov.on.ca](mailto:neil.mckay@oeb.gov.on.ca))  
Zora Crnojacki, Project Advisor ([zora.crnojacki@oeb.gov.on.ca](mailto:zora.crnojacki@oeb.gov.on.ca))  
Giovanna Dragic, Senior Case Administrator ([giovanna.dragic@oeb.gov.on.ca](mailto:giovanna.dragic@oeb.gov.on.ca))  
All Intervenors

UNION GAS LIMITED

Response to Technical Conference Question  
from Board Staff

**Reference:** Issue 1.3

**Question:**

1. Regarding storage and land rights:

- a) Please provide an update and anticipated timing of acquiring the P&NG lease from the Crown.
- b) Please discuss the status of acquiring land and storage rights from the Ministry of Transportation or any other party that is directly affected by the proposed designation and operation of the Heritage Storage Pool.

**Response:**

The Real Estate Section of the Ministry of Transportation for the Province of Ontario and the Public Lands Section of Natural Resources Canada for the Government of Canada are aware of the proposed Heritage Storage Pool project. Discussions have been held with both agencies regarding leases for properties in which they have interests. Neither agency has identified any significant issues regarding the project. Union expects to have the final agreements in place late in 2009.

UNION GAS LIMITED  
Response to Technical Conference Question  
from Board Staff

**Reference: Issue 1.4**

**Question:**

- 2) Please provide a status update on consultations with Aboriginal groups with regard to the following points:
- a) Identify all of the Aboriginal groups that have been contacted in respect of this application.
  - b) Indicate:
    - i) How the Aboriginal groups were identified;
    - ii) when contact was first initiated;
    - iii) the individuals within the Aboriginal group who were contacted, and their position in or representative role for the group;
    - iv) a listing, including the dates, of any phone calls, meetings and other means that may have been used to provide information about the project and hear any interests or concerns of Aboriginal groups with respect to the project.
  - c) Provide relevant information gathered from or about the Aboriginal groups as to their treaty rights, any filed and outstanding claims or litigation concerning their treaty rights, treaty land entitlement or aboriginal title or rights, which may potentially be impacted by the project.
  - d) Provide any relevant written documentation regarding consultations, such as notes or minutes that may have been taken at meetings or from phone calls, or letters received from, or sent to, Aboriginal groups.
  - e) Identify any specific issues or concerns that have been raised by Aboriginal groups in respect of the project and, where applicable, how those issues or concerns will be mitigated or accommodated.
  - f) Explain whether any of the concerns raised by Aboriginal groups with respect to the applied-for project have been discussed with any government department or agencies, and if so, identify when contacts were made and who was contacted.
  - g) If any of the Aboriginal groups who were contacted either support the application or have no objection to the project proceeding, identify those groups and provide any available written documentation of their position. Also, indicate if their positions are final or preliminary or conditional in nature.

- h) Provide details of any know Crown involvement in consultations with Aboriginal groups in respect of the applied-for project.

**Response:**

- a) Contacts regarding this project are as follows:

**Walpole Island First Nation**

Chief Joseph Gilbert

RR #3

Wallaceburg, On. N8A 4K9

**Aamjiwnaang First Nation (Chippewas of Sarnia)**

Chief Chris Plain

978 Tashmoo Ave.

Sarnia, On. N7T 7H5

**Chippewa's of Kettle and Stoney Point First Nations**

Chief Liz Cloud

RR #2

Forest, On. N0N 1J0

- b)

- i) The Union Gas Limited (Union) Manager of Government and Aboriginal Affairs, John Bonin in initial consultation on April 30, 2008 with Walpole Island First Nation representative Naomi Williams, Environmental Assistant to the Executive Director of the Walpole Island Heritage Centre (WIHC), Dr. Dean Jacobs, presented an overview of the project along with maps and general information. At this meeting Mr. Bonin was advised of the other groups involved in the Chenail Ecarté Treaty and Treaty 25 Land Claim negotiations most notably the Aamjiwaang First Nations and the Chippewa's of Kettle and Stoney Point First Nations which the project would be located within.
- ii) As noted above, contact with the Walpole Island First Nations was initiated on April 30, 2008. Contact was first initiated, with the Aamjiwaang First Nations and Chippewa's of Kettle and Stoney Point First Nations on December 18, 2008 when notification was sent to the government agencies and landowners informing them of the project and requesting comments about the project and offering to supply a copy of the Environmental Protection Plan upon request.
- iii) Walpole Island First Nations  
Contacted: Chief Joseph Gilbert  
Dr. Dean Jacobs, Executive Director of the Walpole Island Heritage Centre  
Naomi Williams, Environmental Assistant to Dean Jacobs.

Aamjiwaang First Nations (Chippewas of Sarnia)

Contacted - Chief Chris Plain

Chippewa's of Kettle and Stoney Point First Nations

Contacted- - Chief Liz Cloud

Exclusive of the aforementioned dates, a meeting between Naomi Williams, Environmental Assistant for the WIHC and a Union representative from the geology department was held on May 14, 2008 to assist in the understanding of the work being completed to develop the storage pool. The use of the seismic information and its interpretation to determine the location of the reservoir and the Designated Storage Area were discussed.

On January 16, 2009, Union met with Dean Jacobs, Executive Director of the WIHC and presented him with a copy of the Environmental Protection Plan for the project upon his request.

On January 29<sup>th</sup>, 2009, Union served Aamjiwnaang First Nation by courier delivery and on January 30<sup>th</sup>, 2009 served Chippewas of Kettle and Stoney Point First Nation by registered mail, with a with a copy of the Board's Notice of Application, location map and a copy of Union's Application.

On February 25, 2009, on the request of the Walpole Island First Nations, Union presented an overview of storage pool development to the Walpole Island Heritage Centre staff, portfolio Band Councillors and interested community members to assist those attending in better understanding the process.

- c) In previous Consultations, Dr. Dean Jacobs provided a copy of several presentations that outline the historical treaty rights of Walpole Island First Nations.
- d) Copies of the letters sent to the First Nations informing them of the project as well as the overview presented to the Walpole Island First Nations on January 16, 2009 are attached.
- e) No specific issues or concerns were raised.
- f) No specific issues or concerns were raised.
- g) Dr. Dean Jacobs, Walpole Island First Nation, responded verbally at the January 16, 2009 meeting there were no specific issues or concerns with the project.
- h) We are not aware of any Crown involvement in consultations with the Aboriginal groups in respect of this project.



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December 18, 2008

Chippewa's of Kettle and Stoney Point First Nations  
Chief Liz Cloud  
RR #2  
Forest, On. N0N 1J0

Attention Chief Liz Cloud

**Re: Heritage Storage Pool Development Project**

Dear: Chief Cloud

Union Gas Limited (Union) proposes to develop the Heritage Storage Pool located in Lots 6, 7 and 8 of Concession 15 within the Township of St. Clair (formally Sombra) in Lambton County. Union Gas is proposing to develop the pool commencing with the well drilling in the winter of 2009 and the construction of the pipelines in the summer of 2009.

An Environmental Protection Plan (EPP) for this project has recently been completed by Union which includes information regarding the existing natural environment and proposed mitigations for the protection of the environment in conjunction with the development of the Project.

If you would like a copy of the EPP please contact Mr. Norm Dumouchelle, Environmental Planner, Union Gas Limited, 750 Richmond Street, Chatham, Ontario, N7M 5J5 or at 1-866-949-1595 x 76955 or by email at [npdumouchelle@uniongas.com](mailto:npdumouchelle@uniongas.com) Comments would be appreciated by February 20, 2009.

Thank you for your time in this endeavor.

Yours very truly,

UNION GAS LIMITED

Norm Dumouchelle  
Environmental Planner



December 18, 2008

Aamjiwnaang First Nation  
Chief Chris Plain  
978 Tashmoo Ave.  
Sarnia, On. N7T 7H5

Attention Chief Chris Plain

**Re: Heritage Storage Pool Development Project**

Dear: Chief Plain

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Yours very truly,

UNION GAS LIMITED

Norm Dumouchelle  
Environmental Planner



December 18, 2008

Walpole Island First Nation  
Chief Joseph Gilbert  
RR #3  
Wallaceburg, On. N8A 4K9

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Thank you for your time in this endeavor.

Yours very truly,

UNION GAS LIMITED

Norm Dumouchelle  
Environmental Planner



UNION GAS LIMITED

Response to Technical Conference Question  
from Board Staff

**Reference:** Issue 2.3

**Question:**

3. Maximum safe delta pressure limit was determined by tests in accordance with CAN/CSA Z 341.1 -06. There are 2 required tests that jointly indicate the maximum operating pressure above the discovery pressure: i) Caprock core samples threshold pressure testing; and ii) microfracture testing.

The discovery pressure of the pool was 7,269 kPaa. Union intends to operate the pool at the maximum operating pressure of 10,623 kPaa.

The caprock core samples were obtained and sent for a test. Union stated that results will be submitted to the MNR prior to the first injection.

Please provide more specific estimate of time when the caprock core testing results will be available.

**Response:**

Based on recent discussions with the Testing Laboratory Union is not able to provide a definitive date when the test results will be available. However, it is expected that the results will be available in the next ten to twelve weeks. Again, Union commits to submit the results to the MNR prior to first injection.

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Response to Technical Conference Question  
from Board Staff

**Reference:** Issue 2.4

**Question:**

4. The integrity of a storage pool is to be ensured following the requirements specified in clause 7.1 of the CAN/CSA Z 341.1 – 06. The pre-filed evidence section 3, page 12 describes the results of the studies that were undertaken in compliance with the clause 7.2. Union stated that the actual results of the assessment were sent to the MNR.

Please describe response that Union received from the MNR on the results of the required studies regarding protecting the integrity of the Heritage Pool.

**Response:**

A meeting to discuss the technical aspects of the Heritage pool was held with MNR staff on November 28, 2008. Well license applications and the “Assessment of Neighbouring Activities Report”, in accordance with clause 7.2 of CSA Z341, was submitted to the MNR on December 19, 2008. A copy of the “What if – Analysis of Hazard and Operability Issues”, in accordance with clause 7.1 of CSA Z341, was provided to the MNR for review on February 27, 2009.

Union has not received any negative comments from the MNR on this project

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Response to Technical Conference Question  
from Board Staff

**Reference:** Issue 2.5

**Question:**

5. Regarding the appropriate insurance coverage to be in place prior to construction/operation commencement:

Please explain if the insurance will be available and the coverage and liabilities it will include against environmental and pollution risks of Heritage Pool gas storage development and operation.

**Response:**

Union's insurance program will include, with limits appropriate to the project:

- Commercial general and excess liability insurance for liabilities arising to third parties for bodily injury and property damage resulting from our operations
- Completed operations liability
- Sudden and accidental pollution liability
- Control of well insurance



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# Heritage Pool

March 31, 2009

EB-2008-0405 Technical Conference





## Project Summary

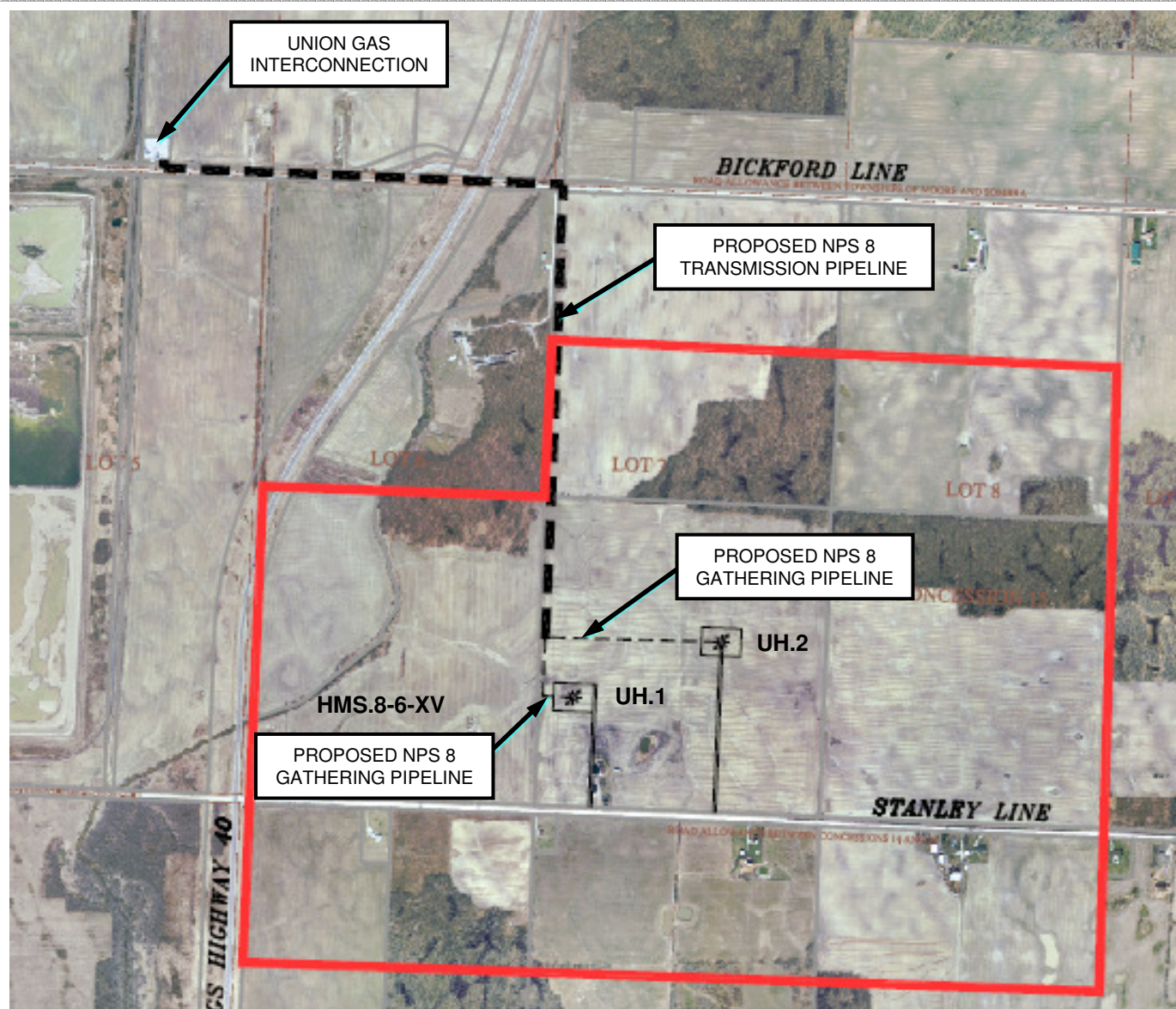
- Working capacity - 26,900  $10^3\text{m}^3$  (0.95 Bcf)
- Proposed facilities
  - 2 I/W wells
  - 2.4 km of NPS 8 pipeline
  - filter/separation, measurement and compression
- Application
  - Designated gas storage area
  - Injection/Withdrawal order
  - Favorable report to the Ministry of Natural Resources (MNR)
- Environmental Protection Plan
- July 1, 2009 in-service



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# Facilities Map

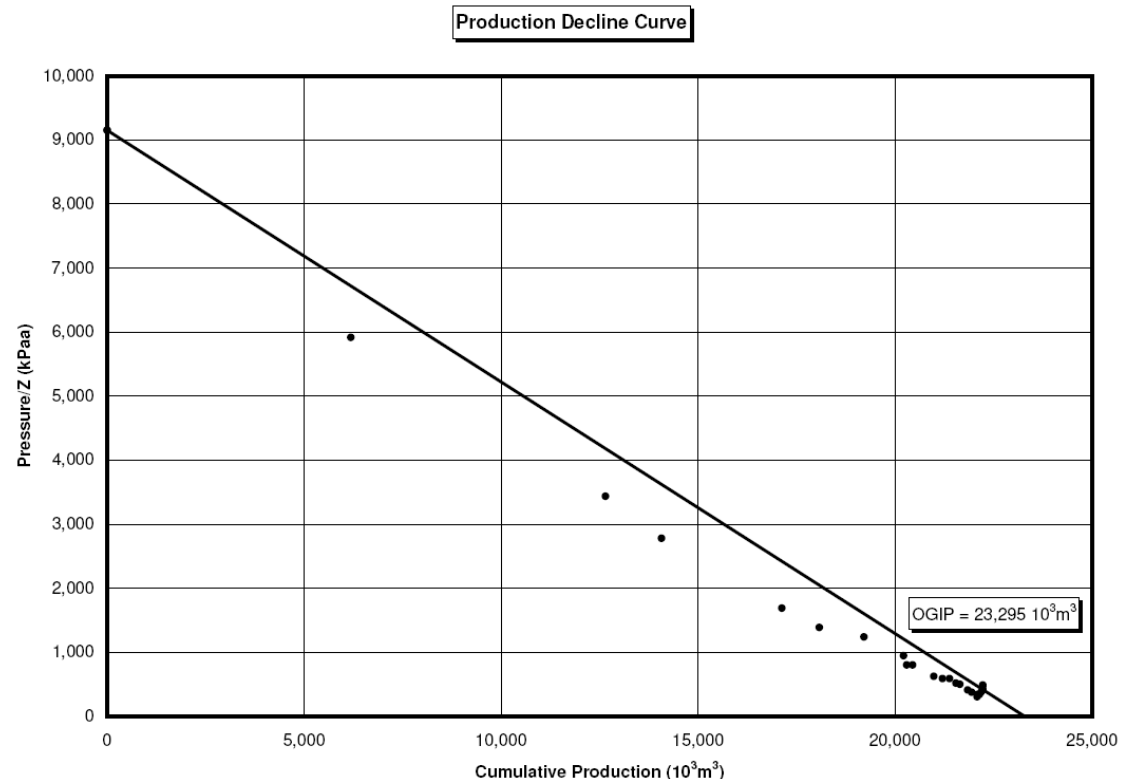






# Production History and Reservoir Parameters

- Heritage Pool discovered in 1992
- Discovery well - HMS.8-6-XV
- Discovery pressure – 7,269 kPaa
- Produced 22,234.2  $10^3\text{m}^3$  (March 1994 – September 2007)
- Current pressure
  - 413 kPaa
- Original Gas-In-Place
  - 23,295  $10^3\text{m}^3$





## Stratigraphic Test Well

- Union Heritage 1 (UH.1) drilled in 2008 to further delineate reservoir characteristics
  - Cored reservoir and caprock
    - Caprock core sample from UH.1
    - Threshold pressure testing
    - Geomechanical testing
  - Completed micro-fracture test
    - Closure Pressure – 15,794 kPaa
    - Closure Pressure Gradient – 23.1 kPa/m



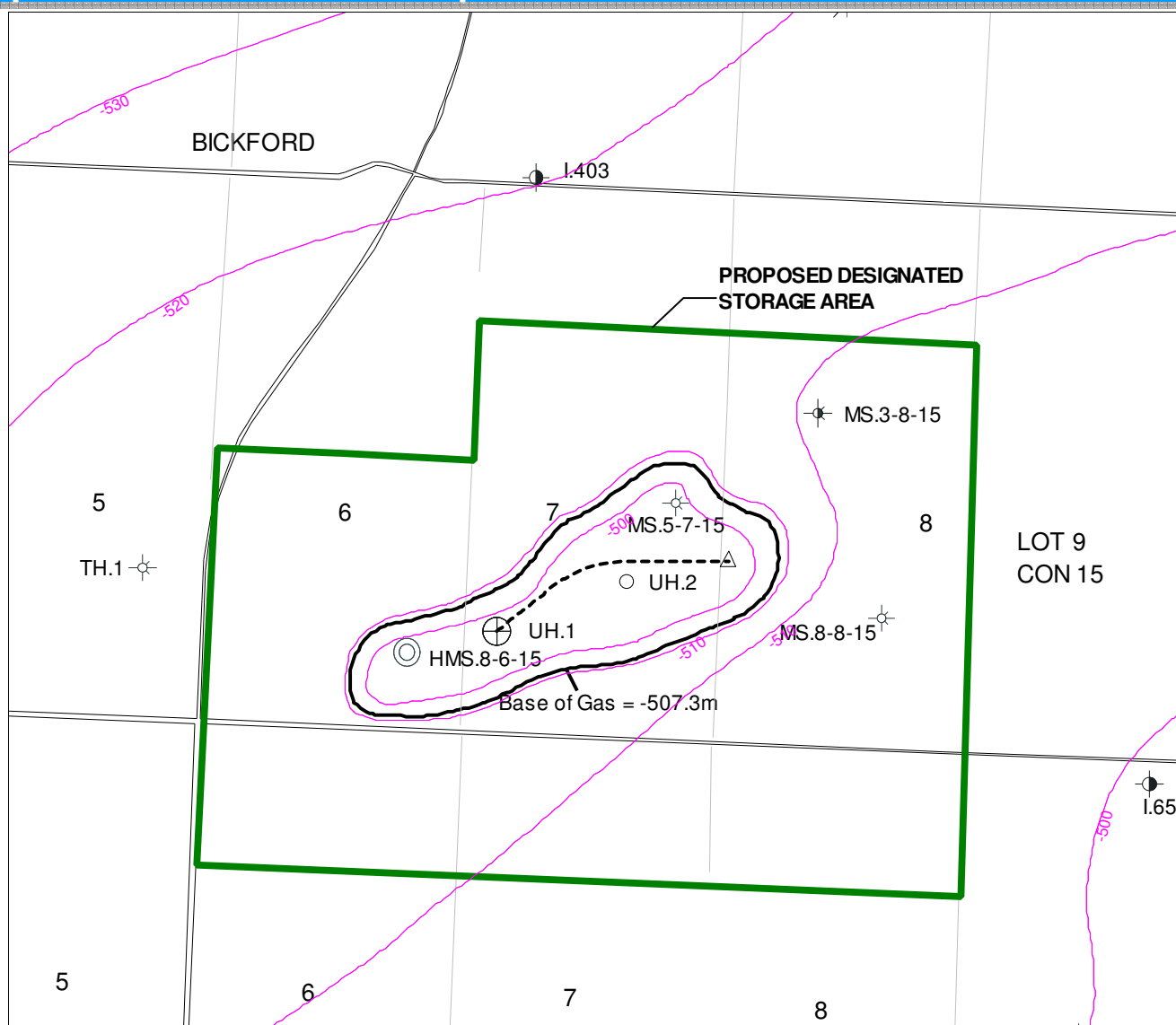




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# Guelph Structure Map

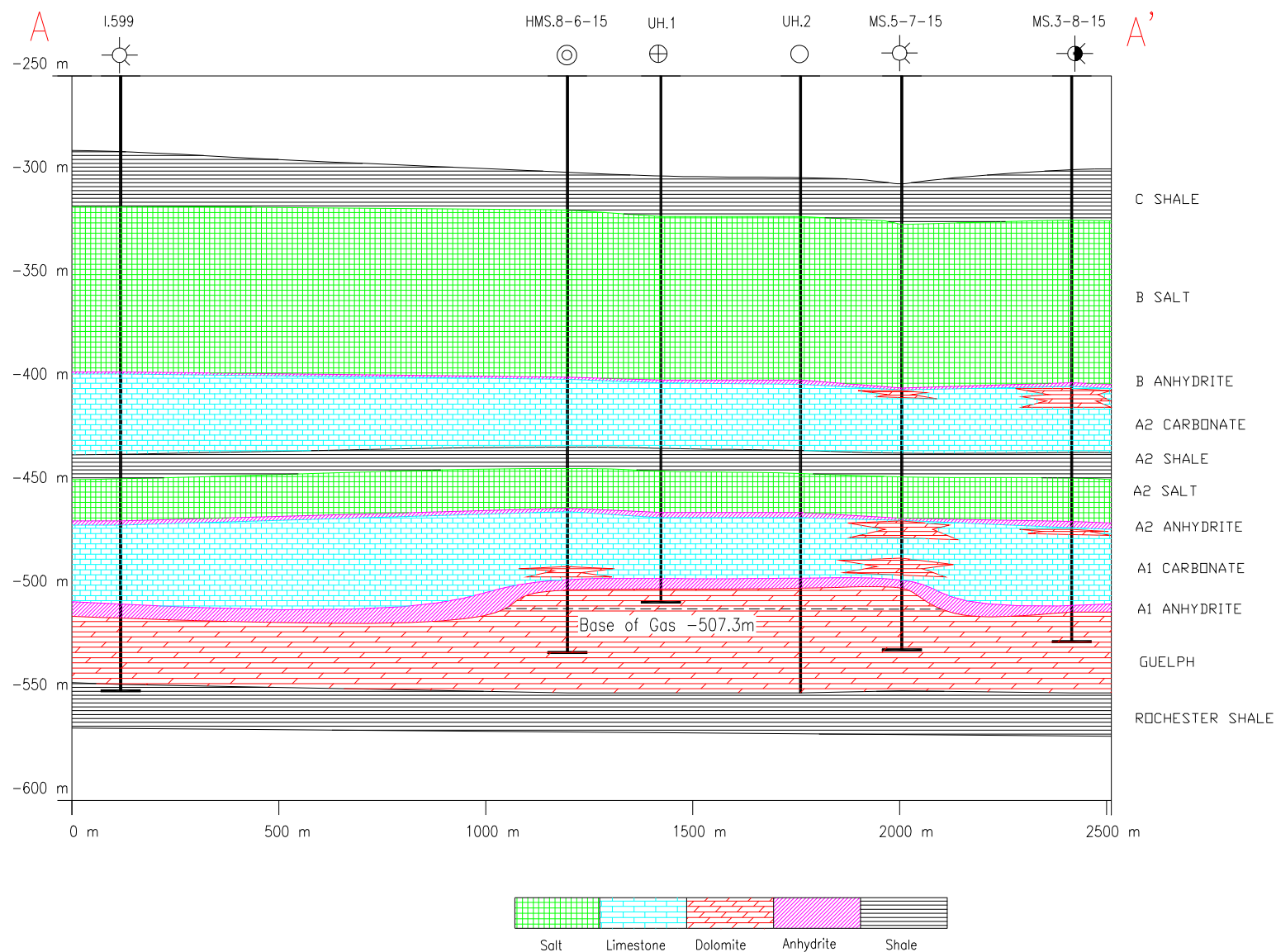




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# Heritage Pool Cross Section



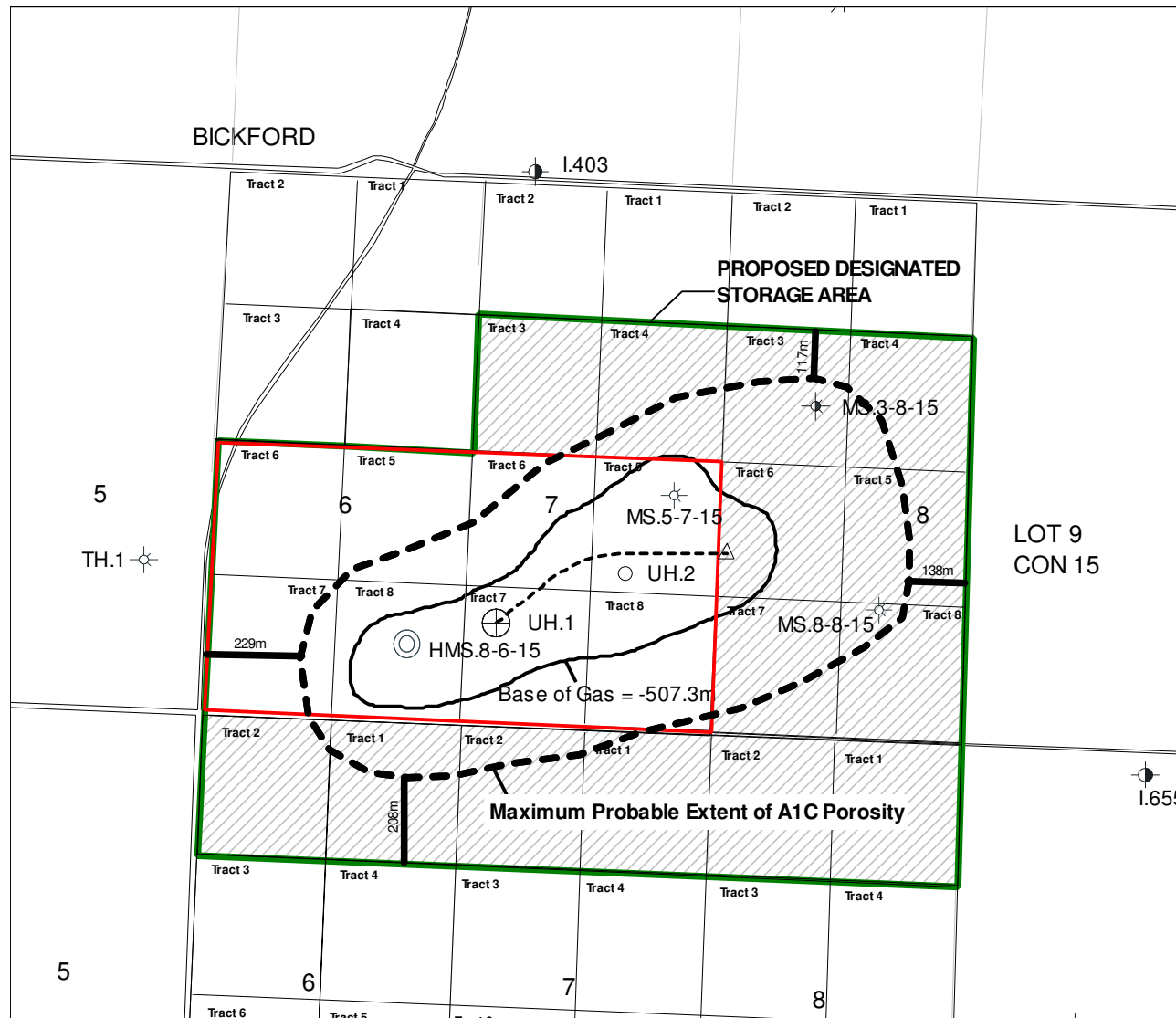


## Proposed Designated Storage Area (DSA)

- 2D and 3D Seismic
- Well information
- Follows MNR Drilling Tracts
- Includes additional lands compared to Unit Area
- DSA boundary accepted by MNR



# Proposed DSA and Extra Lands Map





## Proposed Facilities

- Wells
  - Horizontal leg of UH.1 (UH.1.H1)
  - 1 New Vertical I/W Well (UH.2)
  - Convert HMS.8-6-XV to Guelph Observation Well
- Pipelines
  - 1.9 km of NPS 8 transmission pipeline
  - 540 m of NPS 8 gathering pipeline
- Stations
  - filter/separation,
  - measurement, and
  - compression



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# Union Heritage 1 (Horizontal 1)

## UNION GAS LTD.

Project: HERITAGE (NAD 83)  
Site: Heritage 1 Hz 1  
Well: Heritage 1 Hz 1  
Wellbore: Heritage 1 Hz 1  
Design: 8165554R P2 (NAD 83) (mb/sh)

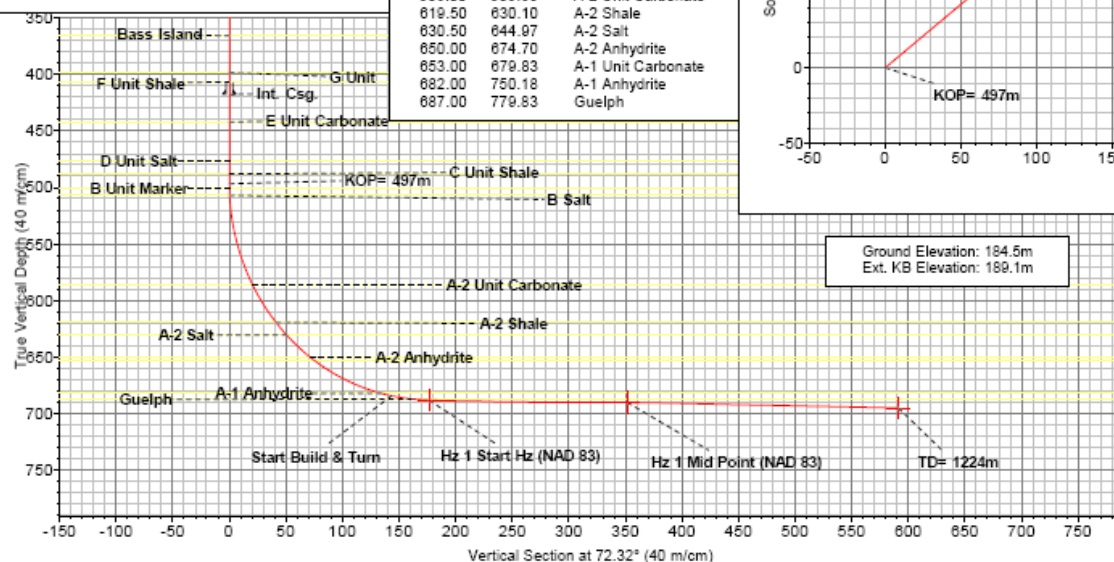
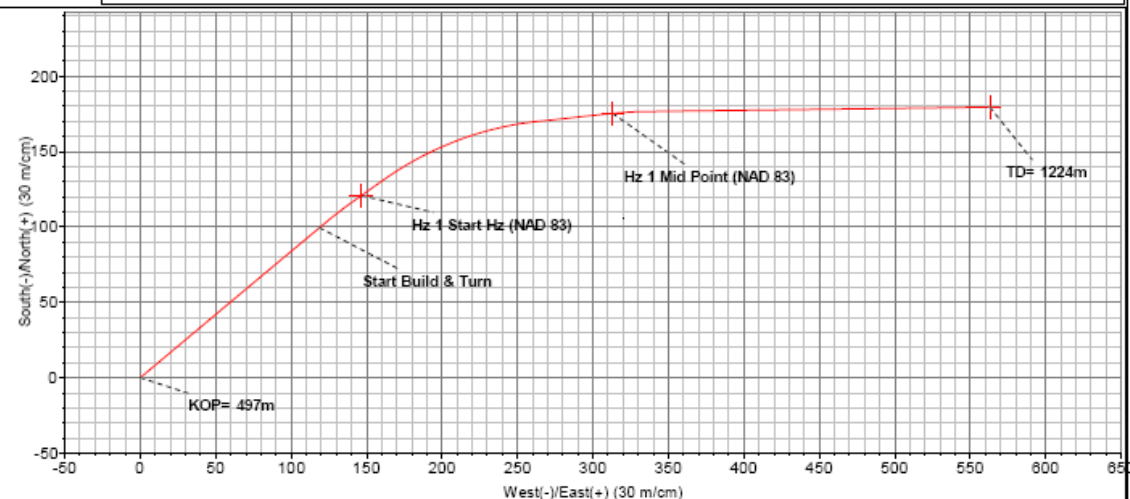


### SECTION DETAILS

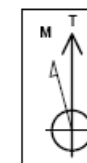
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	0.00	
2	496.63	0.00	0.00	496.63	0.00	0.00	0.000	0.00	0.00	
3	760.35	79.11	50.02	684.19	99.53	118.71	9.000	50.02	143.34	
4	760.35	79.11	50.02	684.19	99.53	118.71	0.000	0.00	143.34	
5	795.72	88.50	55.00	688.00	120.89	146.58	9.000	28.11	176.37	Hz 1 Start Hz (NAD 83)
6	815.72	88.50	55.00	688.52	132.36	162.96	0.000	0.00	195.46	
7	924.42	89.97	83.95	690.01	170.05	263.67	8.000	87.36	302.86	
8	974.12	89.97	83.95	690.04	175.29	313.10	0.000	0.00	351.55	Hz 1 Mid Point (NAD 83)
9	994.46	88.82	89.25	690.26	176.49	333.39	8.000	102.25	371.24	
10	1224.20	88.82	89.25	695.00	179.49	563.06	0.000	0.00	590.98	Hz 1 End Point (NAD 83)

### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
60.60	60.60	Kettle Point/ Bedrock
127.50	127.50	Hamilton
189.10	189.10	F Salt
199.00	199.00	Dundee
228.00	228.00	Detroit River
342.00	342.00	Bois Blanc
366.00	366.00	Bass Island
398.50	398.50	G Unit
406.50	406.50	F Unit Shale
442.00	442.00	E Unit Carbonate
477.00	477.00	D Unit Salt
488.00	488.00	C Unit Shale
500.00	500.00	B Unit Marker
507.00	507.01	B Salt
586.00	589.63	A-2 Unit Carbonate
619.50	630.10	A-2 Shale
630.50	644.97	A-2 Salt
650.00	674.70	A-2 Anhydrite
653.00	679.83	A-1 Unit Carbonate
682.00	750.18	A-1 Anhydrite
687.00	779.83	Guelph



Ground Elevation: 184.5m  
Ext. KB Elevation: 189.1m



Azimuths to True North  
Magnetic North: -7.88°  
Magnetic Field  
Strength: 54765.5nT  
Dip Angle: 70.15°  
Date: 02/12/2008  
Model: IGRF200510

### ANNOTATIONS

TVD	MD	Annotation
496.63	496.63	KOP= 497m
760.23	760.35	Start Build & Turn
1221.67	1224.19	TD= 1224m

### WELLBORE TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Shape
Hz 1 Start Hz (NAD 83)	688.00	120.89	146.58	Point
Hz 1 Mid Point (NAD 83)	690.04	175.29	313.10	Point
Hz 1 End Point (NAD 83)	695.00	179.49	563.06	Point



## Construction Schedule

- Wells
  - UH.1.H1 – June 2009 (upon approval)
  - UH.2 – Following evaluation of UH.1.H1 results
- Pipelines
  - June 2009
- In-service
  - July 1, 2009





## Design, Operation and Construction

- Pool will be designed, constructed and operated in accordance with CSA Z341
- Risk Assessment (cl. 7.1)
  - Completed a Risk Assessment with external HAZOP facilitator
  - Comprehensive review of construction and operations
  - Submitted to MNR - Feb 27, 2009
  - Satisfies requirements of CSA Z341
- Assessment of Neighbouring Activities (cl. 7.2)
  - Submitted to MNR – Dec 19, 2008
  - No issues of concern
  - Satisfies requirements of CSA Z341
- Facilities operated in accordance with Union's O&M procedures and emergency response plans



## Proposed Storage Operations

- Cushion Pressure – 2,100 kPaa
- Cushion Capacity – 5,400  $10^3\text{m}^3$
- Planned Maximum Operating Pressure - 10,623 kPaa (16.5 kPa/m)
- Total Capacity – 32,300  $10^3\text{m}^3$
- Working Capacity – 26,900  $10^3\text{m}^3$



## Market Need

- Storage will become part of Union's overall portfolio
- Storage will be sold ex franchise at market prices
- NGIER decision confirmed need for additional storage
- Union is confident there is demand for the storage
- Ex franchise storage will not be part of Union's regulated activities
- Costs of project will not be passed on to Union's ratepayers



## Environmental Protection Plan

- An Environmental Protection Plan (EPP) was completed by Union in November 2008.
- The EPP documents a plan for the protection of the environment during construction.
- The EPP includes a natural heritage and physical environment inventory report completed by Jacques Whitford for the proposed development. The EPP was forwarded for comment to OPCC members, municipalities, St. Clair Region Conservation Authority and First Nations.
- There have been no significant concerns raised.



## Proposed Mitigation

- Archaeology – Stage I and II completed by D. R. Poulton, no artifacts were found.
- Agricultural Land
  - Soybean Cyst Nematode (SCN) – Testing complete, and negative.
  - Wet soil shut down practice to be implemented.
  - Post construction tiling will be completed.
- Water Well Monitoring – Will be completed again prior to drilling.
- Watercourses - Two minor crossings necessary, permits have been secured from the Conservation Authority.
- Natural Area/Wetland – avoided, construction activities to take place on agricultural land.
- Vegetation – small amount to be removed and some pruning.
- Species at Risk
  - Potential to encounter the Eastern Milksnake, Butler's Gartersnake & Eastern Foxsnake.
  - Information sheets with mitigation to be presented to all workers as a requirement prior to working at the site.



## First Nation Consultation

- Union met with Walpole Island First Nation (WIFN) on April 30, 2008 to present overview of the project.
- Union met with WIFN on May 14, 2008, to discuss seismic operations and storage designation processes.
- Letters forwarded December 18, 2008 to WIFN, Aamjiwnaang First Nation (Chippewa's of Sarnia) and Chippewa's of Kettle and Stoney Point First Nation describing project and Environmental Protection Plan (EPP).
- Project update and EPP provided to WIFN on January 16, 2009.
- February 25, 2009, Union presented an overview of Storage (Storage 101) to WIFN.

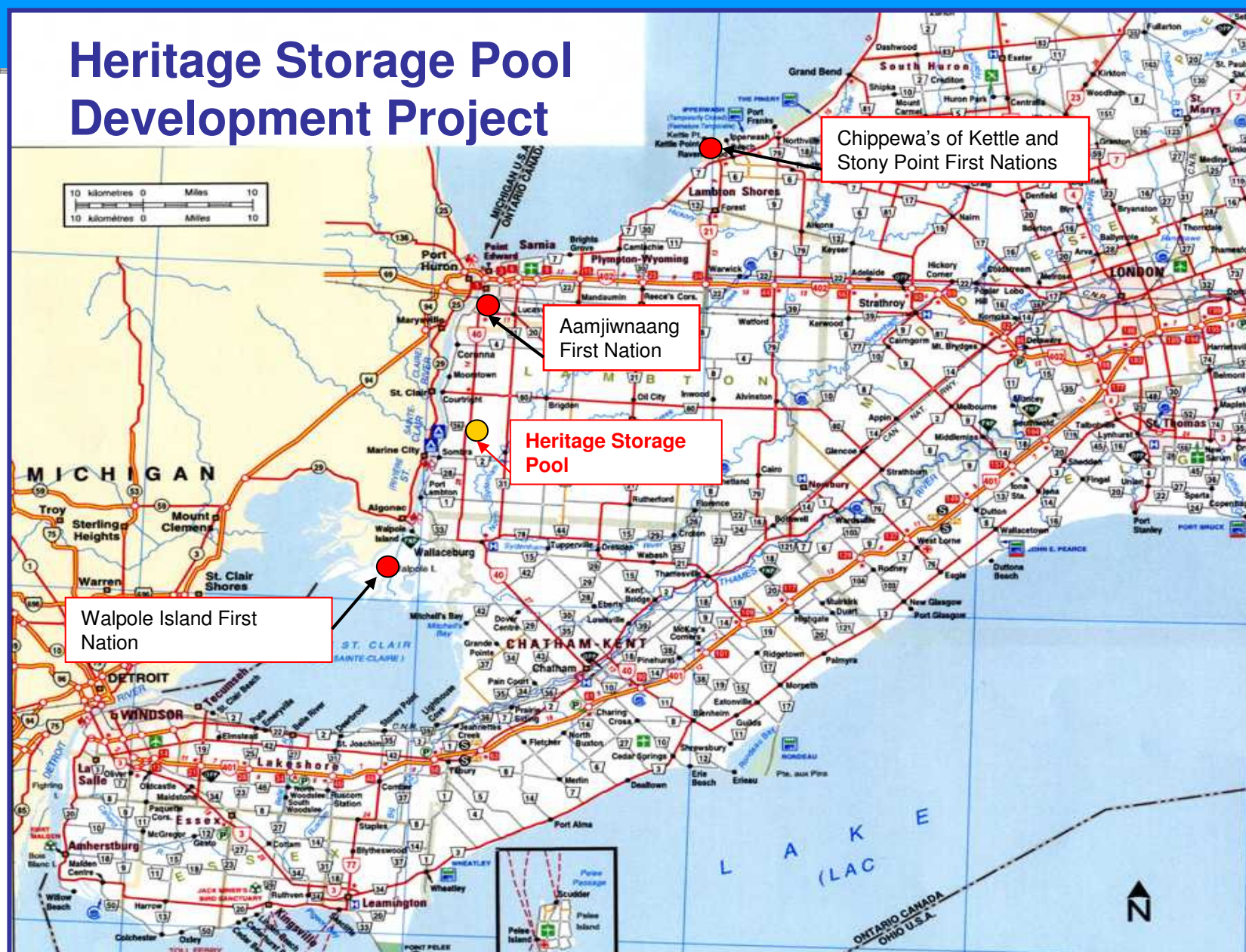




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# Heritage Storage Pool Development Project





## Land Matters

- Have all necessary P&NG and GSL for private properties
- Working to obtain necessary lease agreements for government properties and interests
- Have agreements in place for well locations and access roads
- Have signed agreements (easement and LOU) in place for transmission pipeline
- Have purchased in fee simple station site
- Ongoing meetings with directly effected landowners to keep them up to date on project
- Will implement lands relation program when construction starts
- Landowners have no identified any significant issues during negotiations





## Damages and Insurance

- Union has process in place to deal with damages and insurance issues
- Damages are paid in accordance with storage lease agreements, easement agreements, the letter of understanding and the construction commitment letter.
- Land relation agent will meet with landowners after construction to review construction damages and make appropriate payments
- Union has sufficient insurance in place to cover any unforeseen events including environmental issues



## Summary

- Union has completed the required engineering and geological reports to demonstrate the area should be designated as a storage area and used as a storage pool
- The pools will be operated as per the CSA code and Ontario Regulations
- There are no significant landowner or environmental concerns

# **OPCC Review Summary 2009** **Heritage Storage Pool Development Project**

AGENCY	COMMENT	RESPONSE
St. Clair Region Conservation Authority Phone conversation / Emails from Ashlea Rabideau dated January 16, 2009	<p>Phone conversation January 16, 2009</p> <ul style="list-style-type: none"><li>- Authority inquiry as to proximity of pipeline to Provincially Significant Wetlands. (PSW)</li></ul> <p>Email January 19, 2009</p> <ul style="list-style-type: none"><li>- Authority requiring confirmation of proposed roadways within 120m of PSW.</li><li>- Authority requiring confirmation of any temporary or permanent watercourse crossings, culvert size and location</li></ul>	<p>Email response January 16, 2009 with attached map indicating pipeline proximity to PSW.</p> <p>Email response January 20, 2009 -indicating no roadway to be constructed within 120m of PSW.</p> <p>- Attached map showing location of temporary culvert to be installed in road ditch for access. Road ditch not considered a permitted watercourse. Included Union Gas/DFO endorsed Sediment Control Plan – Vehicle Crossing</p>

## Norm Dumouchelle

---

**From:** Norm Dumouchelle  
**Sent:** January 16, 2009 7:59 AM  
**To:** 'Ashlea Rabideau'  
**Subject:** Heritage Storage Pool Project  
**Attachments:** PSW Location Map.ppt

Hi Ashlea

In response to your inquiry regarding the proximity of the proposed pipeline for the Heritage Storage Pool Project to the Provincially Significant Wetlands in the area, I have attached a map showing the woodlots in question.

- 1) - Bickford Woods which is the main component of the wetland complex, is approx. 190 metres north of the pipeline which will be located within the road allowance of Bickford Line.
- 2) - Woodlot 2 is located directly adjacent to the pipeline easement. The easement and construction activities will be undertaken on the agricultural field east of the woodlot. As you are aware, Union retained the services of Jacques Whitford Limited to conduct a survey of the area and it was determined that the proposed pipeline construction will not produce a significant adverse or net residual environmental negative effect.
- 3) - Woodlot 3 is located approx. 180 metres east of the pipeline construction.

If you have any more questions please don't hesitate to contact me.

**Norm Dumouchelle**  
**Environmental Planner**  
**Project Execution Dept.**

1-866-949-1595 ext. 76955  
cell: 1-519 365-0726  
e-mail: npdumouchelle@uniongas.com

16/01/2009

**Sent:** January 19, 2009 8:01 AM  
**To:** Norm Dumouchelle  
**Subject:** RE: Heritage Storage Pool Project

Hi Norm;

As discussed in our phone conversation of January 16, 2009.

- Woodlot #2 is the only area where the proposed pipeline will be within 120 metres of a wetland.
- The concerns of drainage of the wetland in woodlot #2, via the proposed pipeline has been addressed in the Heritage Storage Pool Environmental Protection Plan provided by Jacques Whitford Limited dated November 2008.
- The Authority requires confirmation of any proposed roadways within 120 metres of the wetlands.
- The Authority requires details of any proposed temporary or permanent watercourse crossings.

If you have any further questions please do not hesitate to contact me.

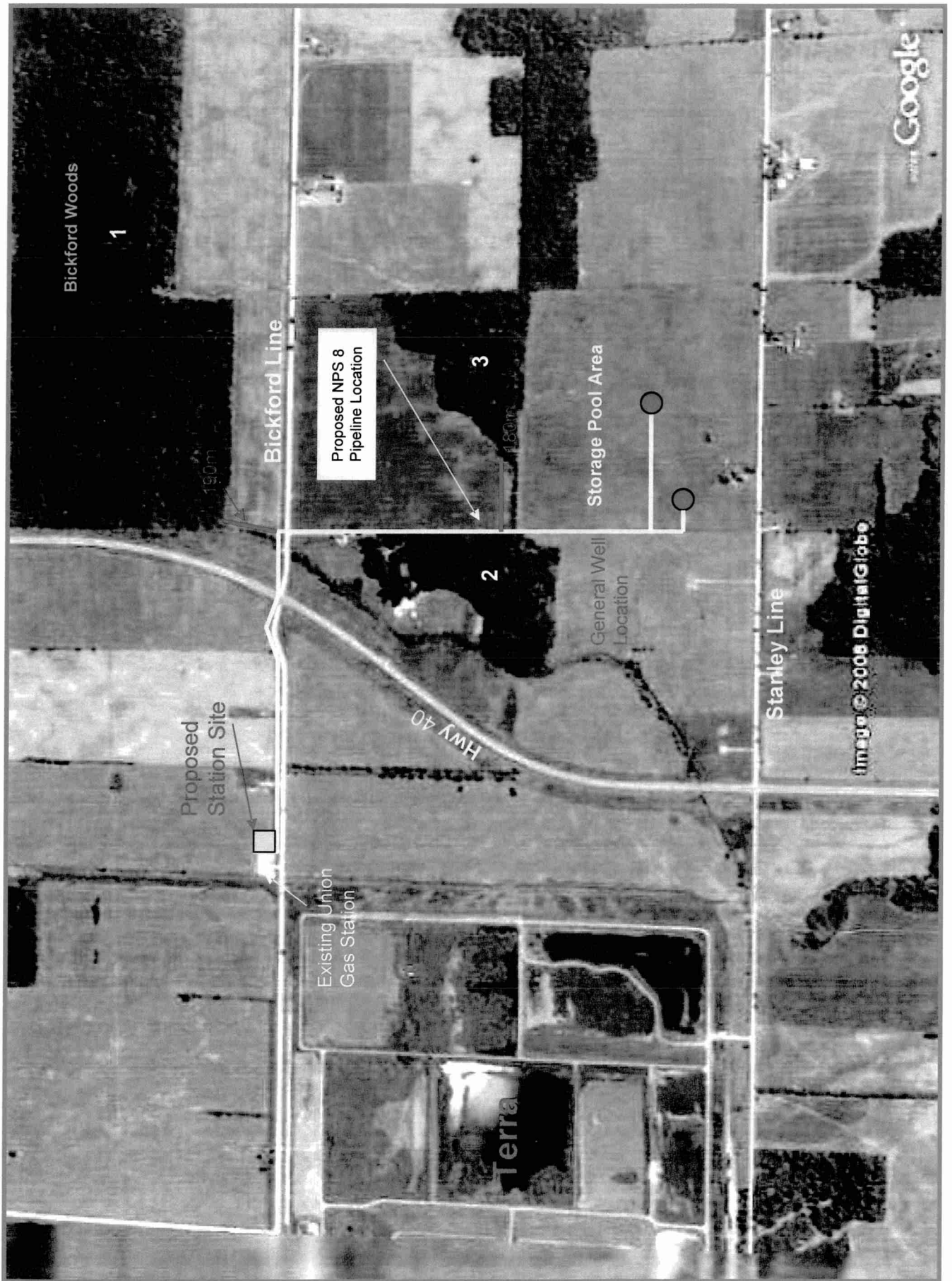
Regards,

*Ashlea Rabideau, Resources Technician*

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*St. Clair Region Conservation Authority  
205 Mill Pond Cres., Strathroy, ON  
N7G 3P9  
(Tel) 519-245-3710  
(Fax) 519-245-3348  
(E-mail) [arabideau@scrca.on.ca](mailto:arabideau@scrca.on.ca)*

# Heritage Pool General Location



## Norm Dumouchelle

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**From:** Norm Dumouchelle  
**Sent:** January 29, 2009 2:45 PM  
**To:** 'Ashlea Rabideau'  
**Subject:** RE: Heritage Storage Pool Project  
**Attachments:** SCR - Culvert.doc; Vehicle Crossing.pdf

Hi Ashlea

Please find attached a photo of the culvert location in question. I have also attached the Union / DFO Sediment Control Plan for Vehicle Crossing which will be followed during the culvert installation.

Thanks

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**From:** Ashlea Rabideau [mailto:arabideau@scrca.on.ca]  
**Sent:** January 28, 2009 1:45 PM  
**To:** Norm Dumouchelle  
**Subject:** RE: Heritage Storage Pool Project

Hi Norm;

Can you provide the details for the temporary culvert (size, installation techniques, ect)

If you have any questions please do not hesitate to contact me.

Thanks

*Ashlea Rabideau, Resources Technician*

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*St. Clair Region Conservation Authority  
205 Mill Pond Cres., Strathroy, ON  
N7G 3P9  
(Tel) 519-245-3710  
(Fax) 519-245-3348  
(E-mail) arabideau@scrca.on.ca*

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**From:** Norm Dumouchelle [mailto:NPDumouchelle@uniongas.com]  
**Sent:** Tuesday, January 20, 2009 12:16 PM  
**To:** Ashlea Rabideau  
**Subject:** RE: Heritage Storage Pool Project

Hi Ashlea

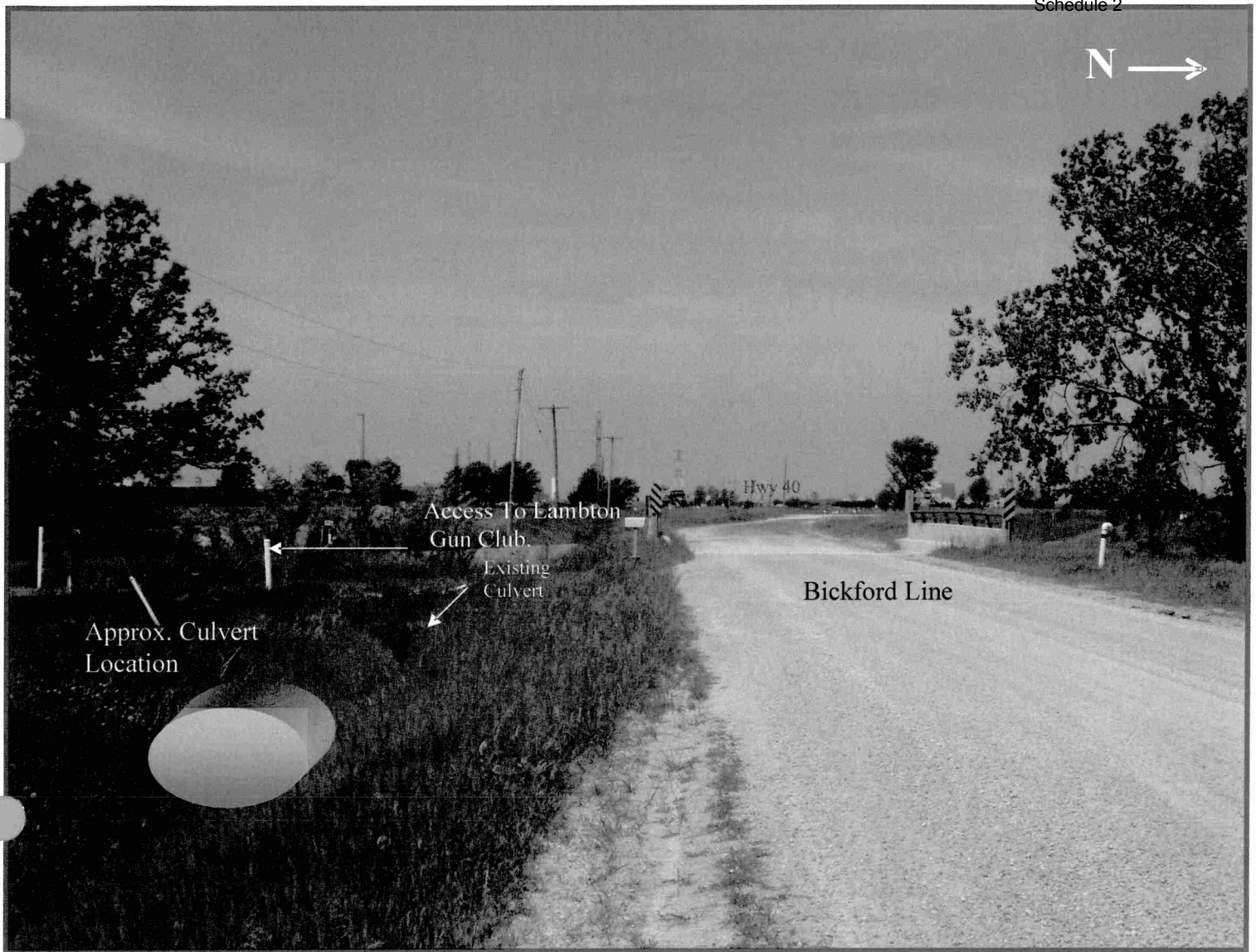
In response to your concerns, there will be no temporary roadways installed along woodlot #2. All work will be performed on the agricultural lands east of the woodlot. Due to a shallow road side ditch and the difference in the grade level between the agricultural field and the road surface, temporary culvert will need to be installed at Bickford Line. The location of the culvert will be approx. 260m from the woodlot. I have attached a map showing the location of the culvert.

Thanks You

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**From:** Ashlea Rabideau [mailto:arabideau@scrca.on.ca]

03/02/2009



The temporary culvert will be the same size (18 in.) as the existing culvert for the access to the gun club or larger. The installation of the culvert will follow the Union Gas / DFO endorsed plan. Generally the culvert is placed in the ditch and covered with a geo-technical material. We then backfill with a course rock and cover this with geo-tech, then a layer of granular "A" for a solid driving surface. The material at the ends of the culvert are raised and stacked to prevent the gravel from migrating into the ditch.



# Heritage Pool General Location



Generic Sediment Control Plan – Vehicle Crossings

This plan sets out the measures that will be taken by Union Gas Limited (company) and its contractors to control downstream sediment to the lowest level practically achievable during the construction, use and removal of temporary vehicle water crossing at streams, rivers and ponds. The conditions and techniques set out on this plan are to be followed unless approved otherwise by the Department of Fisheries and Oceans (DFO).

General Measures

The company must use materials, construction practices, mitigation techniques and monitoring of operations at every water crossing in order to prevent the unauthorized harmful alteration, disruption or destruction of fish habitat or the impairment of water quality. Vehicle crossings typically include temporary bridges such as wooden mats (swamp mats), portable bridges and culvert/grade fill ramps. The following requirements apply to any waterbody (stream, river, pond) and areas adjacent to it.

- \* Temporary vehicle access to be in place for less than four seasons and no work shall occur outside of timing windows, unless, prior approval is obtained from the permitting agency. If temporary vehicle access is to stay in place outside of the in–water timing windows, then appropriate fish passage will be provided.
- \* Use existing vehicle access across watercourses wherever possible.
- \* Prior to removal of the low vegetative cover, effective mitigation techniques for erosion and sediment control must be in place to protect water quality. Limit the areal extent of disturbance to the minimum needed for construction and delay grubbing to immediately prior to grading operations.
- \* Prior to commencing the installation of temporary vehicle crossings, local weather stations will be monitored to determine whether any precipitation is forecasted. If practical work will be delayed until weather conditions are favourable and if flows are in flood stage. If necessary to proceed with work under unfavourable conditions, the company will exercise due diligence.
- \* Vehicle crossing structures capable of handling anticipated high water flows during the construction period will be used. See guidelines below on sizing of water openings.
- \* Coarse cobbles, sandbags, geotextile liners and/or curb stringers to protect culvert and ramp approach fills from erosion and to prevent sedimentation of a watercourse will be used.
- \* On the approaches to vehicle crossing structures, road ditches constructed for drainage control will incorporate the necessary erosion and sedimentation control measures (e.g., silt fence, check dams) to prevent sediment from entering the watercourse.
- \* Except during construction of the crossing, the company will not obstruct any watercourse so as to impede the free movement of water and fish.
- \* All exposed mineral soil must be graded to a stable slope and treated as quickly as possible to prevent erosion and sediment from entering the water.
- \* All temporary vehicle crossing structures will be removed upon completion of construction. Banks and approaches will be restored and stabilized immediately upon removal of a vehicle crossing structure.
- \* The area around water crossings is to be regularly monitored and if erosion problems develop, immediate action is to be taken with appropriate treatments and completed as quickly as possible. Accumulated sediment is to be removed regularly from sediment control mitigations.
- \* Equipment fording will only be allowed with approval from the applicable government agencies. Fording will only be considered if:
  - The fording site does not support known critical aquatic habitat, such as spawning gravels;
  - The fording does not take place during fish spawning, incubation or migration periods;
  - The work site cannot be accessed from the opposite side of the watercourse to avoid fording activities;
  - The fording site has low profile and gradual banks which will not require grading to support vehicle traffic;
  - The fording site has relatively shallow water depths (less than 1m) at time of use;
  - The fording site has coarse substrate which will support vehicle travel without creating erosion and sedimentation;
  - Run–off from the approach slopes to the ford can be effectively controlled to prevent sediment introductions to the stream.
  - The number of crossings of the fording should be limited to a one–time event (over and back).
  - Boundaries of the fording site will be marked on both sides of the crossing to confine all vehicle traffic to the ford.
  - Fords will be aligned at right angles to the channel flow wherever possible to minimize instream travel.
  - Excess soil will be removed from vehicles before fording. In addition, all vehicles using the ford will be in good working order and checked to ensure no fuel, hydraulic fluid or lubricating fluid leaks are present.
  - Bed and banks of ford sites will be restored when no longer needed.
- \* For additional information refer to the Fisheries and Oceans Operational Statement–Clear Span Bridges. If the installation of a clean span bridge can meet all the conditions as stated in the Operational Statement, DFO review is not necessary.
- \* The company will be held responsible for implementation of this plan.

Sizing of Water Opening

It is important that the size of the water opening be selected so the structure can safely pass flood flows that can reasonably be expected to occur during the life of the crossing. Either of the following methods can be followed:

- \* Install a bridge that clear spans the creek from top of bank to top of bank and ensure adequate freeboard to allow for anticipated increase in stream discharge and passage of debris.
- \* Conduct a hydrology analysis to determine theoretical opening size. The design flow will be the two year flood (Q2), unless the culvert is to be left in place through the spring freshet, in which case the theoretical opening size will be based on the five year flood (Q5). Culvert sizes may also be selected to be the same as existing nearby culverts that have been in place for many years and have performed satisfactorily.
- \* Culvert sizes and lengths must be approved by DFO prior to installation.
- \* If culverts are used, the approved size or equivalent multiple culverts must be installed. If a bridge is selected with cribs or piers in the water, the opening must provide the same end area as the culvert and must be approved by DFO.

Detailed Construction Sequence – Temporary Bridges

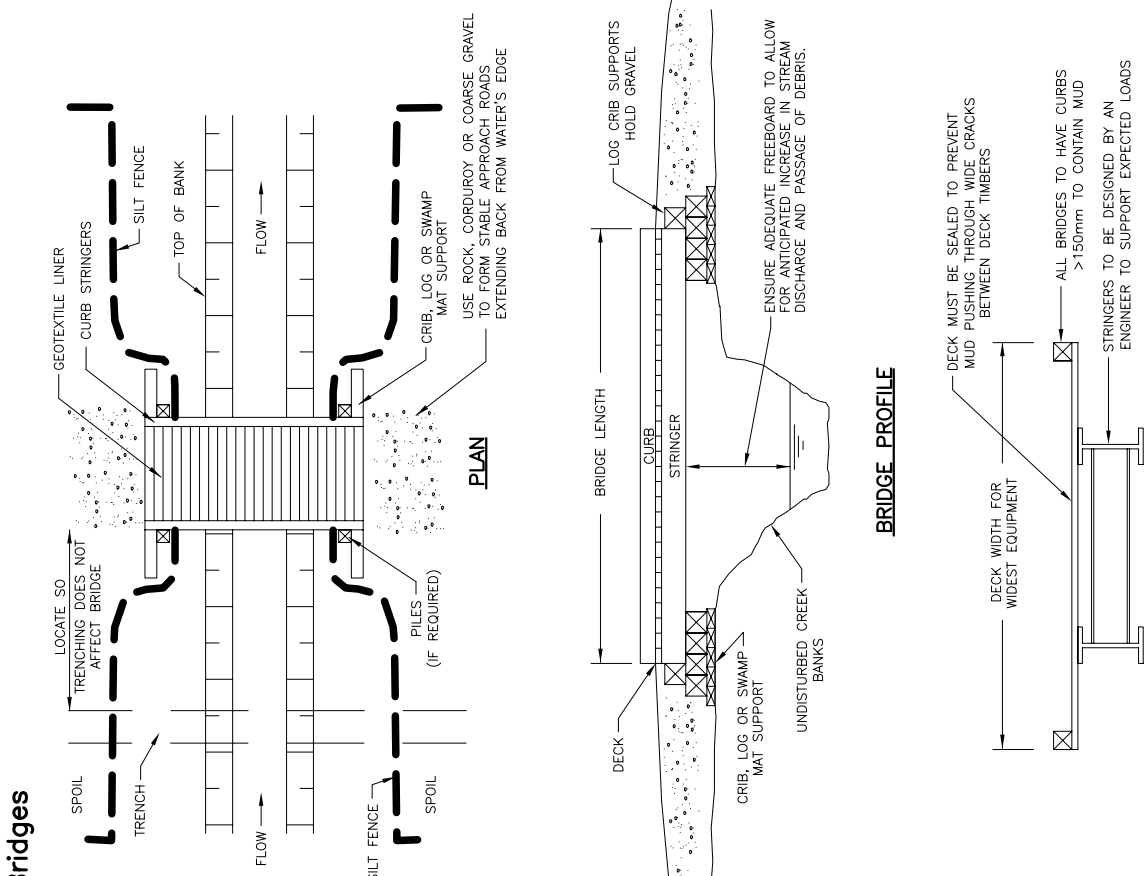
In general terms, the following sequence of construction and mitigation measures will be followed at all temporary bridges:

1. Generally, there are no restrictions on timing for the construction of clear–span structures as they do not involve in–water work. However, if there are any activities with the potential to disrupt fish or fish habitat (e.g., in–water crossing of watercourse by machinery), these should be done during provincial fisheries, timing windows.
2. Install the bridge in a manner that will minimize sediment entering the water. Stringers must be engineered to support the loads expected on the bridge. Curbs at least 150 mm high must be installed along the edge of the deck and if necessary, the deck lined with geotextile to contain mud on the bridge. Fasteners connecting components must be strong enough to hold them in position during the life of the bridge. If used, cribs are to be placed with rock or cobble. Rip rap erosion protection is to be placed around the cribs and on the fill slopes projecting into the water.
3. Road approaches leading to bridges and flume vehicle crossings must be raised and stable so equipment loads are supported a sufficient distance back from the water to reduce mud entering the stream from equipment tracks. This may require using materials such as gravel, rock or corduroy. If cuts are needed to obtain a satisfactory grade, they are to be dug with side ditches and stable slopes. Erosion and sediment control measures are to be installed to keep sediment on land (e.g., check dams, filter cloth, rip rap, seed and mulch, sediment traps, etc.)
4. While the bridge is in use, any buildup of mud on the bridge deck or approaches that is affecting water quality is to be scraped off and disposed of in an approved location.
5. Temporary crossings shall be removed as quickly as possible when no longer required. Surplus gravel and bridge materials are to be removed from the crossing area and stabilized above the floodplain in an approved location. The creek bed and banks are to be restored to a stable angle and protected with erosion resistant material compatible with flow velocity (e.g., coarse gravel or rip rap). Measures such as berms or logs may be needed to prevent sediment laden water running down the road.
6. Vegetate any disturbed areas by planting and seeding preferably native trees, shrubs or grasses and cover such areas with mulch or erosion control matting to prevent soil erosion and to help seeds germinate.

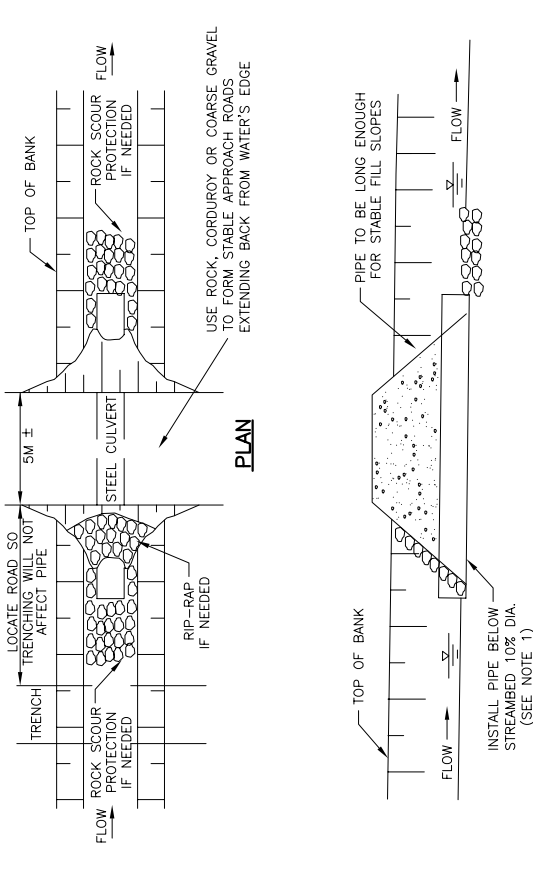
Detailed Construction Sequence – Temporary Culverts

In general terms, the following sequence of construction and mitigation measures will be followed at all temporary culverts:

1. Install culvert pipe of diameter and length as per approval conditions. Culvert invert is to be set to allow a minimum of 10cm water depth for fish passage where soil conditions permit (otherwise at at stream grade and slope). If streambed soils are soft, install coarse gravel or rockfill pad under the pipe. Pipe installation can be done in flowing water unless DFO specifies otherwise. Culvert backfill and fill for the road is to be coarse granular or rock–fill material. Erosion protection may be needed on the upstream road fill slope and if scour is possible, rip rap is to be placed in the streambed upstream and downstream of the pipe outlet.
2. The road approach leading to the culvert crossing must be raised and stable so equipment loads are supported a sufficient distance back from the water to reduce mud entering the water from equipment tracks. This may require using materials such as gravel, rock or corduroy. If cuts are needed to obtain a satisfactory grade, they are to be dug with side ditches and stable slopes. Erosion and sediment control measures are to be installed to keep sediment on land (e.g., check dams, filter cloth, rip rap, seed and mulch, sediment traps, etc.).
3. While the culvert is in use, any build–up of mud on the road surface or approaches that is affecting water quality is to be scraped off and disposed of in an approved location.
4. When the temporary crossing is no longer required, it is to be removed as quickly as possible. Removal shall not occur outside the construction windows as identified in the approval without prior written approval from DFO. Surplus gravel is to be removed from the crossing area and disposed of in an approved location. The creek bed and banks are to be restored to a stable angle and protected with erosion resistant material compatible with flow velocity (e.g., coarse gravel, rip rap or erosion control matting). Measures such as berms or logs may be needed to prevent sediment laden water running down the road.
5. Vegetate any disturbed areas by planting and seeding preferably native trees, shrubs or grasses and cover such areas with mulch or erosion control matting to prevent soil erosion and to help seeds germinate.



TYPICAL STEEL BRIDGE SECTION



STREAM PROFILE

NOTES

Union Gas is responsible for implementation of appropriate sediment and erosion control to mitigate impacts to fish and fish habitat. Fisheries and Oceans Canada, Ontario–Great Lakes Area has reviewed Union Gas drawing, "GENERIC SEDIMENT CONTROL PLAN TEMPORARY VEHICLE CROSSINGS" dated January 2008, and endorses its use as a guideline for implementation of erosion and sediment measures.

For more information on this plan, please contact:  
Doug Schmidt,  
Principal Environmental Planner,  
Union Gas Limited,  
1–800–571–8446, ext. 2895

DATE REV NO REVISION BY APPD



PROJECT  
UNION GAS LIMITED  
CONSTRUCTION PROGRAM

LOCATION  
ALL TEMPORARY VEHICLE CROSSINGS (BRIDGES & CULVERTS) IN ONTARIO

DRAWING TITLE  
GENERIC SEDIMENT CONTROL PLAN TEMPORARY VEHICLE CROSSINGS

SCALE	NTS	DATE	JAN. 1/08
FILE No.		PROJECT NO	
DRAWN	CHECKED	DRAWING	REV
GTH		3 of 3	0
APPROVED			

Section 5  
Schedule 2  
EB-2008-0405