Heritage Gas

PICTOU COUNTY
NATURAL GAS PIPELINE

ENVIRONMENTAL ASSESSMENT REGISTRATION DOCUMENT

JUNE 2013

Prepared by:

verterra group

in association with

DILLON CONSULTING

CRM Group
Cultural Resource Management Group Ltd.

The Environmental Assessment Regulations list the minimum requirements that a proponent must submit to register an undertaking in Nova Scotia. The following table lists the minimum requirements and the corresponding section in the following document where the information can be found.

Table of Concordance with Minimum Requirements for EA Registration

Item	Description	Reference
(i)	The name of the proposed undertaking	Section 1.1 Overview
(ii)	The location of the proposed undertaking	Section 1.1 Overview
(iii)	The name, address and identification of the proponent	Section 8.0 Closure
(iv)	A list of contact persons for the proposed undertaking and their contact information	Section 8.0 Closure
(v)	The name and signature of the Chief Executive Officer or a person with signing authority, if the proponent is a corporation	Section 8.0 Closure
(vi)	Details of the nature and sensitivity of the area surrounding the proposed undertaking	Section 4.0 Environmental Setting
(vii)	The purpose and need for the proposed undertaking	Section 2.3 Project Need
(viii)	The proposed construction and operation schedules for the undertaking	Section 2.5.7 Schedule / 2.6.1 Overview
(ix)	A description of the proposed undertaking	Section 2.0 Project Description
(x)	Environmental baseline information	Section 4.0 Environmental Setting
(xi)	A list of the licences, certificates, permits, approvals and other forms of authorization that will be required for the proposed undertaking	1.3 Regulatory Framework
(xii)	All sources of any public funding for the proposed undertaking	2.3 Project Need
(xiii)	All steps taken by the proponent to identify the concerns of the public and aboriginal people about the adverse effects or the environmental effects of the proposed undertaking	Section 5.0 Consultation
(xiv)	A list of all concerns expressed by the public and aboriginal people about the adverse effects or the environmental effects of the proposed undertaking	Section 5.0 Consultation
(xv)	All steps taken or proposed to be taken by the proponent to address concerns of the public and aboriginal people identified under subclause (xiv)	Section 5.0 Consultation

LIST OF ACRONYMS

AANDC	Aboriginal Affairs and Northern Development Canada
ACCDC	Atlantic Canada Conservation Data Centre
ACOE	US Army Corp. of Engineers
ASL	Above Sea Level
ATV	All-Terrain Vehicle
CCH	Nova Scotia Communities Culture and Heritage
CCME	Canadian Council of Ministers of the Environment
CEAA	Canadian Environmental Assessment Act
cm	Centimetre
CNG	Compressed Natural Gas
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
CRM	Cultural Resource Management Group
CSA	Canadian Standards Association
CTS	Custody Transfer Station
DFO	Department of Fisheries and Oceans
DNR	Department of Natural Resources
EA	Environmental Assessment
ECP	Environmental Construction Plan
EPP	Environmental Protection Plan
FWAL	Freshwater Aquatic Life Guidelines
GHG	Greenhouse Gas
GIS	geographic information system
ha	hectare
HDD	Horizontal Directional Drilling
HP	High Pressure
HPRS	High Pressure Reducing Station
IBA	Important Bird Area
IRR	Irreversible
km	kilometre
KMKNO	Kwilmu'kw Maw-klusuagn Negotiation Office
kPa	kilopascal
L	litre
m	metre
M&NP	Maritimes and Northeast Pipeline
m^2	square metre
MBBA	Maritime Breeding Bird Atlas
MBCA	Migratory Birds Convention Act
mm	millimetre
MOP	maximum operating pressure
MPI	Magnetic Particle Imaging
MWWO	Minor Works and Waters Order

NPS 4	Nominal Pipe Size 4 inch
NPS 6	Nominal Pipe Size 6 inch
NPS 8	Nominal Pipe Size 8 inch
NS	Nova Scotia
NSCC	Nova Scotia Community College
NSDEL	Nova Scotia Department of Environment and Labour
NSDNR	Nova Scotia Department of Natural Resources
NSE	Nova Scotia Environment
NSESA	Nova Scotia Endangered Species Act
NSM	Nova Scotia Museum
NSPI	Nova Scotia Power Inc.
NSTIR	Nova Scotia Department of Transportation and Infrastructure Renewal
NSUARB	Nova Scotia Utility and Review Board
NTS	National Topographic Survey
NWPA	Navigable Waters Protection Act
O&M	operations and maintenance
OAA	Office of Aboriginal Affairs
OH&S	Occupational Health and Safety
PAH	Polycyclic Aromatic Hydrocarbons
PE	polyethylene
PLFN	Pictou Landing First Nation
PPE	Personal Protective Equipment
PRDA	Pictou Regional Development Commission
PCDPC	Pictou County Development Planning Commission
PRS	Pressure Reduction Station
psig	pounds per square inch gauge
RCMP	Royal Canadian Mounted Police
REV	Reversible
ROW	Right-of-Way
SAR	Species at Risk
SARA	Species at Risk Act
SCADA	Supervisory Control and Data Acquisition System
SNSMR	Service Nova Scotia and Municipal Relations
TBS	Town Border Station
TC	Transport Canada
VCR	Voluntary Challenge and Registry
VECs	Valued Environmental Components
WAM	Wet Area Mapping

Table of Contents

List of Figures

List of Tables

Appendices

Table of Contents

List of Figures

1.0 INTRODUCTION

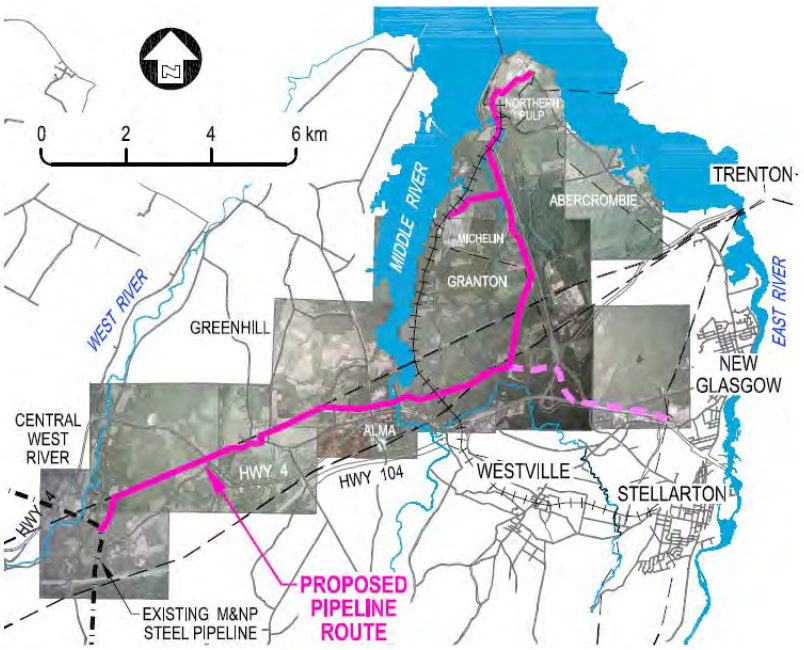
1.1 Overview

Heritage Gas Limited ("Heritage Gas") proposes to construct a natural gas distribution system connecting to the Maritimes and Northeast Pipeline ("M&NP") transmission pipeline to serve natural gas customers in Pictou County. M&NP is a 1,101-kilometre mainline transmission pipeline built in 1999 to transport natural gas from developments offshore Nova Scotia to markets in Atlantic Canada and the northeastern United States.

Initial expansion will consist of the construction of a steel pipeline to industrial customers such as Northern Pulp Nova Scotia Corporation ("Northern Pulp") and Michelin North America (Canada) Inc. ("Michelin"), both located near Abercrombie Point, Pictou County. Heritage Gas has reached a firm agreement with Northern Pulp for natural gas service in 2013. Discussions with Michelin are ongoing, and Michelin is currently conducting an internal evaluation of this opportunity, which is expected to be concluded by year-end 2013. Construction of the steel pipeline is planned to commence in the fall of 2013, with a targeted in service date of December 31, 2013 for Northern Pulp. The proposed route to Northern Pulp is approximately 19 km in length, with the extension to Michelin approximately 1.5 km in length. The construction of the steel pipeline to Michelin will occur after a firm agreement is reached and is currently proposed for 2014.

The location and pipeline alignment for the proposed Pictou County Natural Gas Pipeline (herein defined as the "Project") is shown on Figure 1-1. It includes service to Northern Pulp and Michelin. The Project is the subject of this Environmental Assessment ("EA").

Figure 1-1 Site Location and Proposed Route



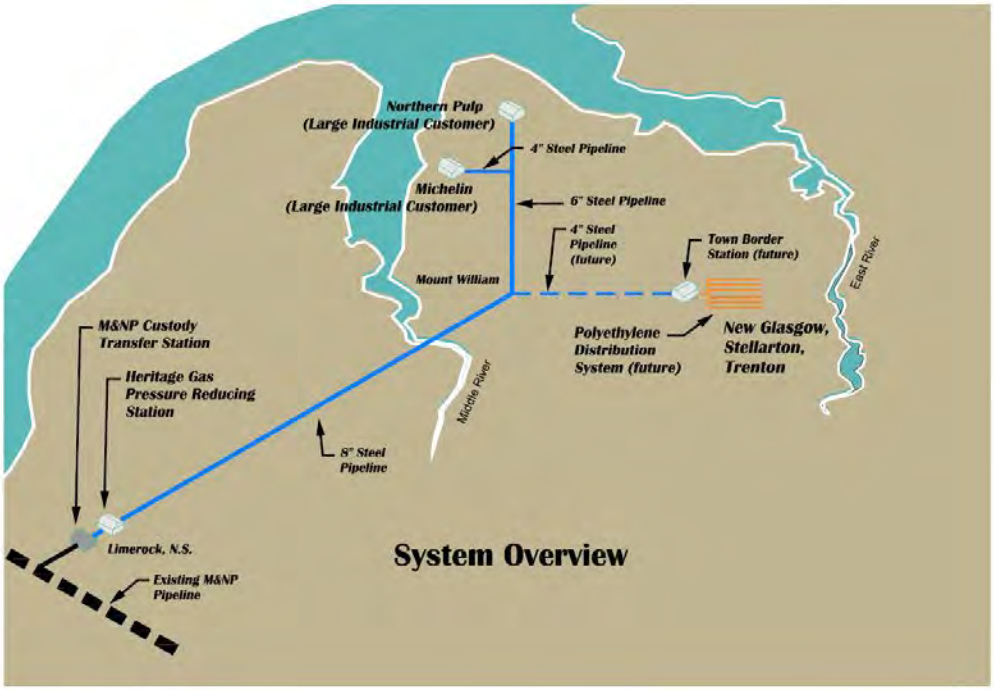
In addition, Heritage Gas is exploring the potential for a future extension to New Glasgow, Stellarton and Trenton as customer demand is confirmed in these areas. This is likely to be in 2014 and beyond. While route planning and evaluation has begun, environmental studies and consultation has not been completed to a sufficient degree to assess potential environmental effects for that possible future expansion. Hence this report focuses on the construction of the confirmed steel pipeline to serve industrial customers near Abercrombie Point, and the potential expansion to New Glasgow, Stellarton and Trenton is only presented for context. The currently suggested route option for the potential expansion is presented in Figure 1-1.

To convey natural gas from the existing M&NP transmission pipeline to customers, the natural gas system includes several above-ground pressure control facilities that are described, together with their specific function, in Section 2.0.

The scope of the Project to be assessed includes pipelines to Northern Pulp and Michelin as well as the above-ground facilities owned and operated by Heritage Gas. The Project is further described in Section 2.0 and the scope of the EA is presented in Section 3.0.

A corresponding schematic of the system overview is provided for information on Figure 1-2.

Figure 1-2 Natural Gas System Overview



The Project has been designed by Heritage Gas based on ecological, social, technical and economic considerations, as well as comments from landowners, regulators and other stakeholders. About 75 percent of the entire alignment will be constructed primarily paralleling existing corridors or within previously disturbed land (i.e., existing utility, roadway, or railway corridors, or agricultural land).

The remainder of the alignment is located within privately managed woodlots. Where possible, Heritage Gas has avoided crossing watercourses and wetlands. Where crossings are unavoidable, the pipeline will cross under wetlands and watercourses using trenchless technologies. This is a key factor in Heritage Gas' planning of the Project to minimize risk of adversely affecting the environment.

Environmental planning, including mapping of constraints, desktop review and field work, has been completed on the Project. As part of this analysis, four alternative routes were evaluated in detail. The evaluation included the engagement of regulatory agencies, stakeholders, and First Nations, discussions with landowners, and engineering and constructability analysis. The proposed route has been optimized considering key ecological, social, cultural, economic and technical factors.

More detail on location, pipeline engineering, project need, planning and design, and proposed Project activities together with the proposed schedule can be found in Section 2.0.

1.2 Proponent

In 2002, as part of its Franchise Application, Heritage Gas committed to build out its natural gas distribution system on the basis of sound economic principles. The planned system was to be expanded to provide service to customers in the franchise area and to reach new areas when the economics permitted. Development would only occur on the basis of confirmed customer commitments or a high probability that sufficient customer loads would be recruited and served.

Heritage Gas has operated a gas distribution system within its franchise area since 2003. During that time, Heritage Gas has constructed hundreds of kilometres of pipelines and expanded service within its franchise area, for which it has obtained numerous approvals from a wide variety of agencies including most Provincial departments listed in this EA document. Heritage Gas currently distributes natural gas within Halifax, Dartmouth, Bedford, Halifax Airport, Amherst and Oxford, serving approximately 4,500 customers representing over 20,000 homes and businesses.

Heritage Gas is now proposing to expand natural gas distribution service to Pictou County. The initial expansion is to serve industrial customers in Pictou County (Northern Pulp and Michelin). Following this initial expansion, Heritage Gas expects to provide natural gas service to other commercial and residential customers in Pictou County. The expansion to Pictou County was approved by the Heritage Gas Board of Directors on March 21, 2013. It was jointly announced by the Province and Heritage Gas on April 5, 2013.

The objective of the Project is to expand the pipeline infrastructure allowing Heritage Gas to continue to grow within its franchise area. This expansion will provide residents of Pictou County with access to a price competitive and environmentally friendly energy choice. The proposed expansion is economic based on revenue and cost projections from serving this customer base.

The Project is considered by Heritage Gas a typical undertaking with well-known impacts, standard mitigation measures, and proven construction methods. Heritage Gas constructed a very similar project in 2005 in Cumberland County (Amherst Expansion).

Heritage Gas has utilized trenchless technologies, specifically horizontal direction drill ("HDD") routinely in both cross-country and urban pipelines. Heritage Gas' experience with this successful construction method includes:

(1) the installation of the Halifax Harbour Crossing, which saw the installation of a 900 metres long, 12 inch diameter steel pipeline by drilling in bedrock 70 metres beneath the Halifax Harbour in 2007.

(2) the crossing of River Philip completed in Cumberland County in 2012.
The latter is an example of a project similar to the scale of the proposed Pictou County project, as it was underneath a sensitive watercourse.

Heritage Gas' corporate values include environmental responsibility and management of environmental issues. These values are articulated and applied in Heritage Gas' Environmental Policy (http://www.heritagegas.com/heritage-gas-environmental-policy.html). Environmental protection during pre-construction, construction and operations activities is governed by the Environmental Protection Plan ("EPP"). The EPP details environmental protection procedures for effective environmental stewardship during design, construction and operation phases. The EPP provides practical guidance for Heritage Gas staff, consultants, contractors and subcontractors. In addition to the provisions of the EPP and included in detailed construction drawings as required, Heritage Gas prepares Environmental Construction Plans ("ECP") to address site specific environmental control measures.

When planning linear pipeline projects and selecting and evaluating alternate routes, Heritage Gas carefully considers a number of criteria to minimize impact on both the natural, cultural and built environment. Examples of such guidance criteria include, but are not limited to:

- Avoidance of areas of environmental sensitivity (e.g., designated wetlands, significant wildlife habitats, etc.);
- Routing the pipeline in, or adjacent to existing already disturbed corridors (i.e., existing utility, roadway, or railway corridors, or agricultural land); and
- To the fullest extent, locating the pipeline away from the built environment to minimize impact on existing landowners and land uses (for example, locating the pipeline along the back boundary of a property and avoiding diagonal intersection of land parcels wherever possible).

Where routing selection cannot avoid socio-economic or ecological sensitivities, adverse effects are minimized via incorporating mitigative measures in the detailed Project design. Heritage Gas has committed to the following key mitigative measures:

- Utilize trenchless technologies to minimize impact, especially at watercourse crossings, wetland crossings, and locations with high potential for rare plants;
- Discourage unwanted use of a linear corridor by maintaining undisrupted buffer zones that act as barriers; and ;
- Apply buffer zones to protect rare plants found during early and late rare plant surveys in consultation with DNR.

1.3 Regulatory Framework

1.3.1 Federal

Federal authorizations are not likely to be required on the Project. Federal authorizations could be triggered by crossing federal lands or impacts to fish habitat or navigation. It is not expected that there will be any federal lands crossed, nor any impacts to fish habitat or navigation from the Project. This is based on the following:

- Due to use of HDD under the watercourses instead of crossing the watercourse in-stream, no approvals are expected to be required from Department of Fisheries and Oceans ("DFO").
- As part of equipment access, a number of temporary bridges are likely to be necessary. It is expected that, in terms of navigational impacts, the Transport Canada definitions of "minor water" as per the Minor Works Waters Order under the Navigable Water Protection Act will apply in the locations where temporary bridges are required; hence, subject to final confirmation, the work is expected to be exempt because it is crossing over non-navigable water.
- In discussions with NSE during the Project's planning phase, it appears that one culvert will be requested to be installed by NSE to facilitate drainage at one location of the alignment; the surface water at this specific location is understood to be non-fish bearing based on personal communication between NSE and DFO.

While no authorizations are expected to be required from the Federal government, Heritage Gas commits to obtaining all requisite approvals prior to undertaking work on the Project, should this change. For more information on consultation with Federal authorities, refer to Section 5.0.

1.3.2 Provincial

On June 17, 2013, the Minister of Environment determined that an EA is required because the Project has the potential to cause significant adverse effects. While the Project was not triggered specifically under Schedule A of the Environmental Assessment Regulations as the maximum operating pressure was below 3450 kPa, the Minister has exercised discretion under subsection 11(3) of the Regulations to designate the Project as a Class 1 undertaking as it is an extension of the M&NP transmission pipeline constructed in 1999. Because of the existing environmental planning and consultation that has occurred as part of Heritage Gas' due diligence to gather appropriate field data and to minimize environmental effects in the Project planning phase, Heritage Gas is in a position to respond to the Minister's decision promptly and to register the Project in the Provincial EA process.

Other approvals or permits from the Province are potentially required for the Project. These are:

- Alteration of a watercourse for temporary bridges and one NSE-requested culvert, from NSE; and
- Work within a highway right-of-way (i.e., soils breaking permit) from Nova Scotia Department of Transportation and Infrastructure Renewal ("NSTIR").

Heritage Gas plans to use HDD under all watercourses and wetlands. In some locations, access is proposed to facilitate construction logistics.

- Where access is required over watercourses to facilitate construction, temporary bridges would be proposed; an application would be made to NSE for a blanket approval for installation of temporary bridges.

- Where access is required over wetlands to facilitate construction, wetland disturbance will be minimized. Under the 2011 Wetland Conservation Policy, this type of work will not require an approval where works occurs in exempt habitat is under 10m wide linear corridor and is under 600 square metres in surface area. These proposed plans have been and will continue to be under discussion with staff at the Pictou County NSE office.

In addition, all the work installed by Heritage Gas receives a Permit to Construct and a Licence to Operate issued by the Nova Scotia Utility and Review Board ("NSUARB") pursuant to Pipeline Regulations. NSUARB is a quasi-judicial body that is at arm's length from the Province.

No other permits or approvals are expected to be required from the Province. However, should this change, Heritage Gas commits to obtaining all requisite approvals prior to commencing work. For more information on consultation with Provincial authorities, refer to Section 5.0.

1.3.3 Municipal

Municipal permits may be required as part of the Project, in particular building permits for above-ground facilities such as the High Pressure Reducing Station.

Heritage Gas has engaged with the Municipality of Pictou County planning and development officials on several occasions. Refer to Section 5.0 for a summary of consultation with the Municipality.

1.4 Development and Structure of Document

This report documents the assessment of the environmental effects of the proposed construction, operation and decommissioning of the Project. The EA has been completed based on potential for interaction of the proposed Project with the environmental and socio-economic setting. This report has been prepared in accordance with the Proponent's Guide to Environmental Assessment (Nova Scotia Environment, 2001, revised 2009).

The document was prepared by Verterra Group Environmental Strategies Ltd. ("Verterra") in association with Dillon Consulting Limited ("Dillon") and Cultural Resource Management Group ("CRM"). As the principal of Verterra, Janis Rod has completed numerous federal and provincial EAs within various industries, including the renewable energy industry. Her professional experience on scoping, authoring and reviewing EA reports is supported by the expertise of staff of Dillon who compiled primary and secondary data sources, completed field work and authored Section 4.0 of this report which outlines the environmental setting, as well as supported in the analysis of potential environmental effects. Peer reviewers from Dillon reviewed and contributed comments on the document. Staff of CRM also contributed to the EA report via expertise related to archaeology and the cultural environment. In

addition, the consulting team was well supported by staff of Heritage Gas who assisted in development of the EA report and its review.

Following this introduction of the EA report, the Project is described in Section 2.0 in terms of location, pipeline routing and engineering. In addition, activities in major phases of the Project are described. The potential for accidents and malfunctions are also described. Section 3.0 presents the scoping and methodology used in the EA. The environmental setting is presented in Section 4.0, including biophysical and socio-economic aspects. Section 5.0 describes the consultation program completed to date and ongoing plans to consult within the Pictou County community, the Mi'kmaq, and regulatory agencies. The analysis of the interaction of the Project and the environmental setting is presented in Section 6.0 based on valued environmental components ("VECs") and socio-economic aspects. Section 7.0 presents the commitments of Heritage Gas to follow up and monitoring of the Project while the closure, including signature of the Proponent, is provided in Section 8.0. Following the bibliography, the appendices contain supporting information as referenced in this document including correspondence and reports completed for the Project.

Table of Contents

List of Figures

List of Tables

2.0 PROJECT DESCRIPTION

2.1 Site Location and Layout

Heritage Gas proposes to construct and operate a natural gas distribution pipeline in Pictou County from the existing M&NP transmission pipeline in Limerock to industrial customers near Abercrombie Point as illustrated in Figure 2-1. The undertaking is comprised of approximately 20.5 km of high pressure ("HP") steel pipeline ranging in size from 219.1 millimetre (nominal 8 inch, or NPS 8), to 114.3 millimetre (nominal 4 inch, or NPS 4) as follows:

- From the M&NP pipeline to Mount William Road: 11.2 km of 219.1 mm diameter (NPS 8)
- From Mount William Road to Northern Pulp: 7.8 km of 168.3 mm diameter (NPS 6)
- Pipeline to Michelin: 1.5 km of 114.3 mm diameter (NPS 4).

Natural gas is conveyed from the M&NP transmission pipeline to customers through several above-ground facilities listed below with their specific function:

(1) Custody Transfer Station ("CTS"): owned and operated by M&NP – includes tap into the M&NP transmission pipeline, and provides natural gas filtering and metering. This facility is under National Energy Board jurisdiction and is owned and operated by M&NP (therefore not within the scope of the Project). The CTS operates at a maximum operating pressure ("MOP") of 9940 kPa (1440 psig).

(2) High Pressure Reducing Station ("HPRS"): owned and operated by Heritage Gas and located adjacent to the M&NP CTS. This facility contains natural gas pre-heating, metering, odourant addition, and pressure regulation to reduce the natural gas pressure to pipeline MOP as defined herein.

"Example of Heritage Gas High Pressure Reducing Station"

(3) Pressure Reduction Station ("PRS"): required at each of the large industrial customers – owned and operated by Heritage Gas. These facilities are site specific and may contain natural gas pre-heating, metering (to measure usage), pressure regulation equipment to reduce natural gas pressure down to a level usable by the customer (typically in the range of 275 to 415 kPa, i.e. 40 to 60 psig for large industrial customers).

(4) Isolation Valves: required to isolate portions of the system in case of emergency or if maintenance or repairs are required, and are located to facilitate future expansion;

(5) Town Border Station ("TBS"): potential future facility that will only be required if and when the natural gas system expands to the urban areas of Pictou County in 2014 and beyond. Contains pressure reduction equipment to cut natural gas pressure down to a MOP of 690 kPa (100 psig) for distribution into the polyethylene (PE) natural gas distribution system. This station is not included in the Project scope for the purposes of this EA.

The Project scope subject to this EA is clearly defined in Section 3. The Project footprint includes the right-of-way ("RoW") to construct the pipeline, ancillary features i.e. access roads and HDD set up areas, and the sites for above ground facilities i.e. one HPRS and two PRSs. Heritage Gas has provided NSE and NSDNR with the digital Project footprint delineation.

Within the Project footprint, approximately 27 ha will be cleared. Existing disturbed corridors were used where possible for the pipeline alignment. Of this total area to be cleared, it is estimate that less than 1% of the project footprint consists of ancillary features and above ground facilities.

2.2 Pipeline Engineering

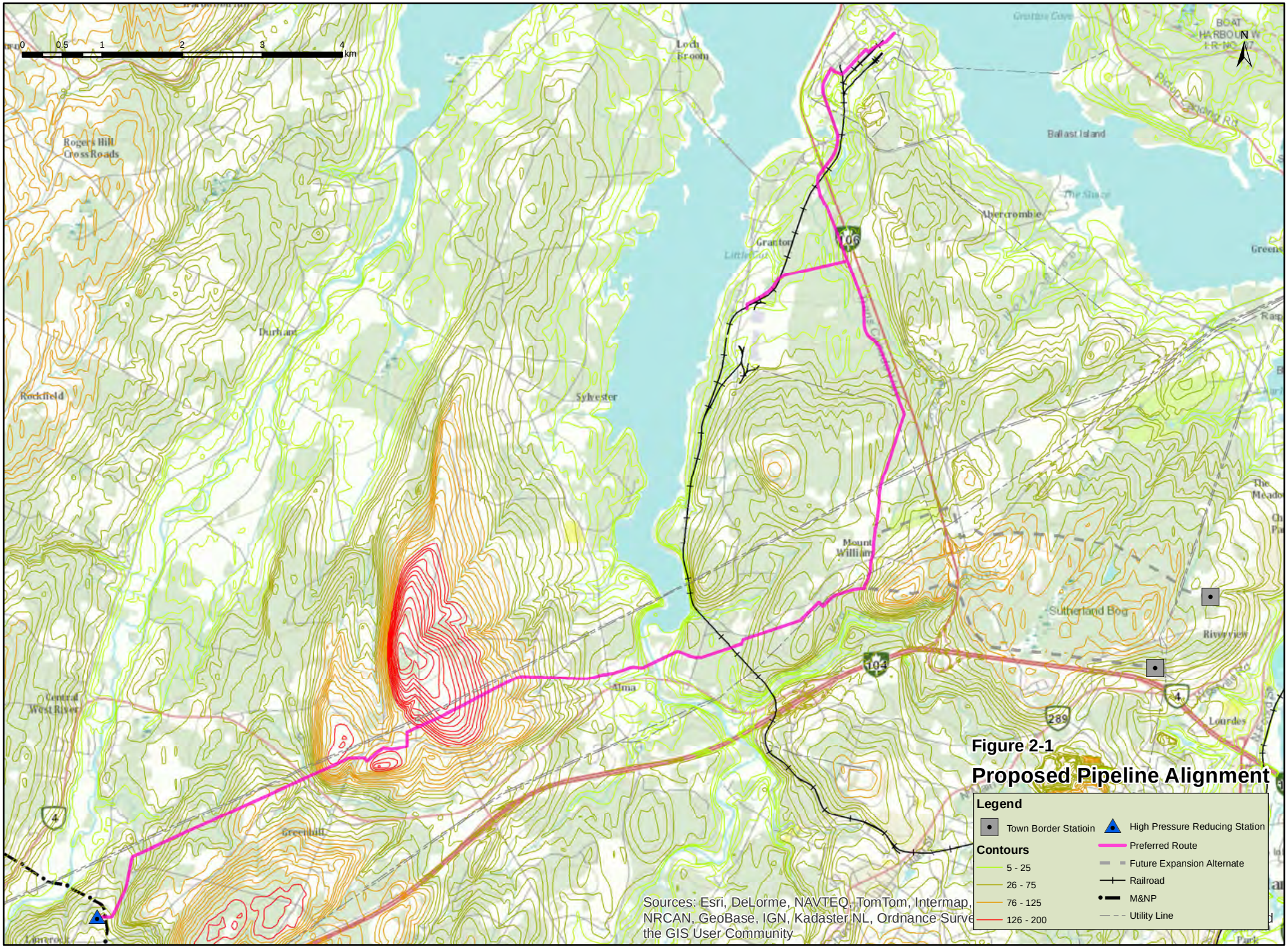
The Project consists of:

- Underground HP steel pipeline at a total length of 20.5 km;
- Above ground HPRS at transfer point of natural gas from the existing M&NP in Limerock;
- Two PRSs at the two proposed large industrial customers near Abercrombie Point;
- Isolation valves;
- Cathodic protection rectifier beds;
- Environmental protection and control measures; and,
- Ancillary aspects including areas used during construction of the HP steel pipeline, temporary access and workspaces.

Odourant is added to the natural gas at the HPRS to make leak detection possible by smell. Other system control measures include: valves used to isolate portions of the system for emergency shut off and preventive maintenance, over-pressure relief valves, cathodic protection of the steel pipeline to prevent corrosion, and a supervisory control and data acquisition ("SCADA") system.

The Project will be constructed to meet or exceed the standards required in CSA Z662 Oil and Gas Pipeline Systems (latest edition) and all associated standards and practices. This is a stipulation of the Nova Scotian regulatory framework for oil and gas pipelines which includes:

- Pipeline Act – An Act Respecting the Transmission of Oil and Gas
- Pipeline Regulations made under the Pipeline Act
- Gas Distribution Act – An Act Respecting the Delivery and Sale of Natural Gas in the Province; and
- Gas Distribution Regulations made under the Gas Distribution Act.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Rogers Hill Cross Roads
Durham
Rockfield
Sylvester
Granton
Abercrombie
Ballast Island
Mount William
Sutherland Bog
Riverview
Lourdes
Alma
Central West River
Greenhill
Lismore
106
104
289
4
Figure 2-1
Proposed Pipeline Alignment
Legend
Town Border Statioin
High Pressure Reducing Station
Contours
5 - 25
26 - 75
76 - 125
126 - 200
Preferred Route
Future Expansion Alternate
Railroad
M&NP
Utility Line
Sources: Esri, DeLorme, NAVTEQ, TomTom, Intermap,
NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Surve
the GIS User Community

The Project will consist of welded steel pipe to convey natural gas from the HPRS to the PRSs at the large industrial customers near Abercrombie Point. In light of newly received information, Heritage Gas has reviewed operating pressure requirements and subject to obtaining appropriate permits from the NSUARB, will specify a MOP of 4965 kPa (720 psig) for the proposed pipeline. The MOP of the pipeline does not have any effect on the scope of the Project or predicted environmental effects as described in the EA.

Heritage Gas has designed the pipeline with the following parameters:

- hydraulic modeling with the capacity to serve all its projected customers in Pictou County, both present and future,
- set the test pressure at 1.4 times the MOP; and
- selection of pipeline materials that meet the CSA Z662 Standard for a pipeline with a MOP of 720 psig.

The pipeline will be installed underground for the entire length. The depth of the pipe burial will meet or exceed the minimum standards of the CSA Z662. Locations where the standard will be exceeded will generally be in response to the requirements of the property owner in which the pipe is installed.

Table 2-1 provides a summary of the minimum cover requirements in various locations. The table is nominally based on CSA Z662, however, it also presents Heritage Gas cover requirements particular to the Project in Pictou County.

Table 2-1 Minimum Cover Requirements for Buried Pipelines (cm)[1]

Location	Soil Conditions	Rock Conditions[2]
General	60	60
Within pipeline easement	90	75
Crossing travelled surface (road)[3]	200	200
Below roadway ditch[3]	120	To be determined
Railway[4]		
Uncased Crossing (≤ NPS 6)	305	305
Uncased Crossing (> NPS 6)	762	762
Uncased Parallel (within 7m of track)	183	183
Uncased Parallel (outside 7m of track)	305	305
Watercourse Crossing	150[5, 7]	60
Wetland Crossing	100[6]	100
Drainage and Irrigation Ditch Invert	75	60
Local Access Road	150	90
Agricultural Land	120	n/a

1. Measured to top of carrier or casing pipe
2. Rock excavation requiring stripping or by comparable means of breaking (no blasting permitted for the Project)
3. NSTIR requirement
4. Within 7 m of centreline of the outside track, measured at right angles to the centreline of the track (CBNS Rail)
5. Cover not less than 60 cm may be used where analysis indicates the potential for erosion is minimal.
6. Depth of cover below bottom of wetland.
7. Watercourse crossings installed using HDD typically have >500 cm cover.

The steel pipeline will meet the specifications of CSA Z245.1 Steel Pipe (current edition) with additional specifications as determined by Heritage Gas. The steel grade will be 290 or greater. The pipe wall thickness for each pipe size will be selected in combination with material yield strength of the steel based on maintaining the magnitude of hoop stress experienced at MOP to below 30% of Specified Minimum

Yield Stress ("SMYS"). A cathodic protection system, coupled with "yellow jacket" polyethylene coating on the pipeline, will ensure system integrity and protection from corrosion. Where directional drilling is being utilized, the pipeline will be coated with dual powder abrasion coating.

Isolation valves will be located at two locations along the pipeline alignment. An above ground valve site has been identified at the transition point from the 219.1 mm (NPS 8) to the 168.3 mm section at approximately 11.2 kms. This valve site will provide isolation capabilities for the pipeline as well as an inline inspection tool ("smart pig") receiver. A second above ground valve site will be located at approximately 15.2 kms along the pipeline alignment to accommodate the extension to Michelin subsequent to the 2013 construction without requiring a hot tap of the pipeline.

The pipe diameter determination and section length of the three sizes: 114.3mm (NPS 4); 168.3mm (NPS 6); and 219.1mm (NPS 8) was based on hydraulic model analysis and projections of future demand. Heritage Gas staff use the software SynerGEE Gas provided by GL Noble Denton to model the pipe network for peak usage conditions, typically peak hourly winter data when all potential customers are on the system, and including the two industrial customers initially served by the Project. Pressure limitations are dictated by the MOP of pipelines.

2.3 Project Need

Over the past several years Heritage Gas has held ongoing discussions with many of the large industrial companies in Pictou County, with particular emphasis on NSPI, Michelin and Northern Pulp with the aim of securing these customers as anchors to support the economic justification of a natural gas pipeline to serve Pictou County.

Following extensive consultation with stakeholders as well as potential customers (refer to Section 5.0), Heritage Gas has renewed direct conversations with Northern Pulp and Michelin, both together and separately. In April 2013, Heritage Gas reached a firm agreement with Northern Pulp for natural gas service. Discussions are continuing with Michelin. Michelin is currently conducting an internal evaluation of this opportunity, which is expected to be concluded by year-end.

On April 5, 2013, the Province and Heritage Gas held a joint Press Release to announce the plan to expand the natural gas system to Pictou County. The full Press Release is attached in Appendix A. The following is an excerpt from this announcement, a quote from the Minister of Energy:

> "Our businesses, families, and others in the community understand the benefits of natural gas, and the province is pleased to work with Heritage Gas to deliver it," said Energy Minister Charlie Parker. "It will save millions of dollars in energy costs for large industrial employers, with savings around the corner for small businesses, hospitals, schools and family homes."

The estimated total investment for the proposed project is $17.8 million. This capital investment will be partially offset by a Customer Contribution in Aid of Construction ("CIAC") in the amount of $2.5 million, which is fully reimbursable as soon as other large customers connect to the pipeline. The CIAC amount has been provided to Heritage Gas by the Province of Nova Scotia. Other than the reimbursable CIAC, there is no public funding. The total cost of the investment includes capacity to serve future potential expansion in Pictou County.

This natural gas infrastructure development will have significant positive benefit for Pictou County. Converting Northern Pulp to natural gas will reduce greenhouse gas ("GHG") emissions and improve energy efficiency. Heritage Gas estimates that the total GHG emission reduction to be achieved by Northern Pulp is estimated to be over 13,000 tonnes per year. Conversion to natural gas will eliminate reliance on Heavy Fuel Oil (i.e., Bunker C) as a fuel source. It will improve the long-term viability of Northern Pulp's facility, which is highly beneficial for its skilled workforce of 250 direct employees and for the residents of Pictou County.

There is a strong global market for the Mill's pulp product (Northern Bleached Softwood Kraft, or NBSK). This product is recognized in the market for its high quality. The natural gas conversion will help the Mill's production become more cost-competitive.

The Project is expected to have similar positive environmental and economic benefits to the Michelin facility in Granton, assuming it will also connect to the natural gas distribution system. The Project also makes possible the future expansion to the towns of Stellarton and New Glasgow. Overall, this project is of vital importance to the future economic development of Pictou County, to create and sustain jobs in rural Nova Scotia, and reduce energy costs to homes and businesses.

2.4 Management, Planning and Design

2.4.1 Management

Heritage Gas has assigned a broad, diverse team of project managers, technical staff and consultants to complete the management required for all Project activities. The team will include engineering design, environment, procurement, lands, sales and marketing, and construction and operational staff. The team will assemble experienced personnel including Heritage Gas employees, consultants and contractors as required to complete the work.

Key responsibilities of the management system for each of the Project phases are described below. Outside of the Project, planning and sales / marketing activities associated with potential expansion are ongoing as part of Heritage Gas' core business activities.

Pre-Construction Management

A number of management activities are conducted prior to construction of the pipeline to facilitate timely project completion. These activities include:

- system planning and design, focusing on the environmental and engineering aspects of route selection and facility site selection;
- application of Environmental Protection Plan (EPP) and identification of any Project specific conditions;
- pre-construction activities, including surveying and soils and environmental investigations;
- regulatory permits and land access, to be secured in a timely manner;
- materials procurement, including documentation pertaining to quality control of pipe material and components; and,
- contracted resources, to be tendered for prior to construction.

The Heritage Gas EPP was originally compiled in 2004 and provided to NSE for information. The document has been revised including the most recent 2012 edition.

Construction Management

The construction stage of the project will include contract administration, construction, clean up, and pre-commissioning. Key construction management activities include:

- control of construction schedule and budget;
- coordination of construction logistics;
- coordination of contractors and contract administration;
- communications with the public and stakeholders during construction;
- application of company programs and procedures relating to construction activities;
- execution of the work in accordance with project standards and specifications;
- implementation of the safety, quality control, quality assurance and environmental management programs, including supervision of all independent testing and inspection requirements;
- certification, pre-commissioning and hand-off to operation; and,
- retention of construction records, including as-built information is collected.

Operation and Maintenance Management

At the end of construction, the system is pre-commissioned and handed-off to the Heritage Gas operation team. The operation and maintenance stage of the project will include operation, routine maintenance and surveys, and safety programs. Key operation management activities include:

- operating and monitoring the gas distribution system in accordance with applicable regulations, including Pipeline Regulations (Nova Scotia);
- maintenance of above and below ground facilities, including cathodic protection;
- monitoring and adjusting odourant levels in the system;
- locating underground pipelines as part of the “Call Before You Dig” program;
- emergency response; and,
- public awareness and education.

Decommissioning

Should circumstances change such that it is prudent for components of the Project to be decommissioned, work will be managed by the construction management team.

2.4.2 Assessment of Alternatives

Engineering and Environmental planning, including mapping of constraints, desktop review and field work, have been completed on this Project related to developing and comparing alternative routes. As part of this analysis, four routes were evaluated in detail including feedback from stakeholder consultation, discussions with landowners, and engineering and constructability

analysis. The proposed routes have been optimized considering key ecological, social, cultural, economic and technical factors.

Given the need for expansion of natural gas into Pictou County, the alternatives to the project and alternative means of carrying out the Project must be considered. The first considers the potential for alternative means of conveying natural gas for distribution to residential, commercial, industrial and institutional customers. The second considers alternative means or methods to carry out the project, i.e., modifications on alignment of pipeline and siting of above-ground facilities.

Alternatives to the Project

The Project proposes to provide a more cost-effective and environmentally cleaner fuel to two large industrial customers with potential expansion in future. The outcome of the proposed project reduces reliance on more expensive and carbon intensive fuels, such as Bunker C, and will result in lower GHG and particulate emissions. A pipeline is the most economical and environmentally sound means to convey natural gas from the proximate M&NP transmission pipeline to residential, commercial, industrial and institutional customers in Pictou County.

One alternative to a piped gas distribution system is a compressed natural gas ("CNG") system. In some instances CNG may be the only economically feasible alternative for customers, for example in service regions that are distant from transmission pipelines; yet wherever constructing a pipeline is feasible, it will result in lower costs to customers and will have fewer environmental impacts (for example, GHG emissions are increased through transportation of CNG by road). A pipeline system is a safe, versatile and more reliable when compared to other alternatives; it can be designed to deliver energy at a high flow-rate, which is a requirement of Northern Pulp to operate some of its equipment.

Other alternatives, such as energy conservation and efficiency measures, may influence gas demand, but will not eliminate the underlying demand for natural gas with these customers. Renewable energy sources, such as solar or wind, will not deliver energy at the rate required by these large industrial customers, particularly on a peak day.

Therefore, constructing a pipeline from the existing M&NP transmission pipeline is the most beneficial in terms of broader economic development potential.

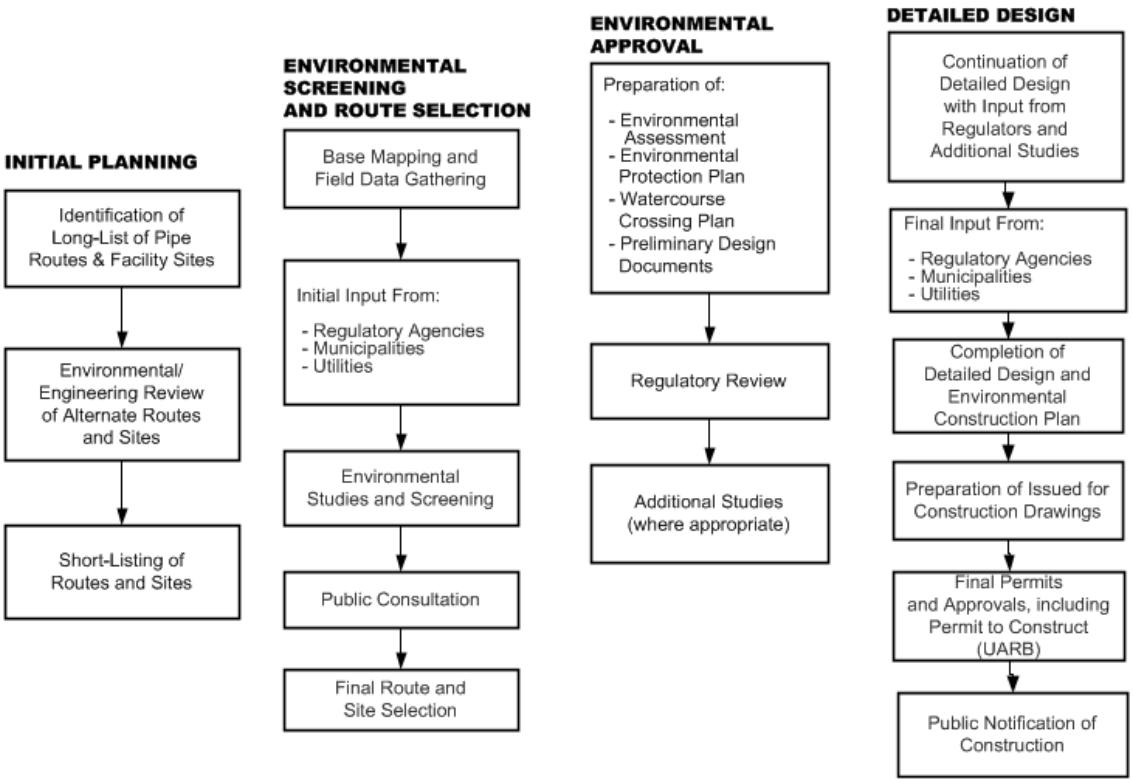
Alternative Means of Carrying Out the Project

The alternative means of carrying out the project relates to evaluating alternative alignments for the pipeline and the selection of the preferred alignment. Routing and siting involve the collection and analysis of a wide variety of data, addressing social, technical, economic and environmental factors. The process of identifying the preferred alignment is described in Section 2.4.4.

2.4.3 Route Selection and Design Approaches

The sequence of activities required for planning of alternate routes and facilities siting and selection, interfacing with stakeholders, and the design and approvals process is described in the flow diagram presented in **Figure 2-2.**

Figure 2-2 Typical Design Process Flowchart



This diagram provides an overall view of the typical steps in the planning, environmental screening and route selection, environmental approval and detailed design to lead to approvals to allow construction to commence. This is an iterative process and is not a linear progression; it allows incorporation of environmental planning aspects into the detailed design stages to ensure that environmental management is integrated into all phases of the planning process.

The initial routes were selected to connect the M&NP transmission pipeline to Northern Pulp taking into account Michelin as a potential customer, as well as the future take-off for potential expansion to other areas of Pictou County in 2014 and beyond.

It is noted that the M&NP transmission pipeline bisects Pictou County on a diagonal from southeast to northwest. Heritage Gas initially investigated the potential to connect to M&NP at two locations, one being the location eventually selected, at Limerock, and the other being due

south of Stellarton in the vicinity of the Stellarton-Trafalgar Road near Lorne Station. On a straight line, the distance from Lorne Station to Abercrombie Point is approximately 25 kilometres, whereas from Limerock to Abercrombie is approximately 15 kilometres. In addition to the longer distance, causing comparatively greater disruption, it is known that a pipeline alignment from the south would have crossed the area between Stellarton and Westville, which would have a greater risk of encountering subsidence issues associated with the extensive old mine workings present in the area. Therefore, the M&NP connection point selected allows for a safer, more economical development.

The initial routing alternatives were evaluated based on desktop geographic assessments at 1:50,000 scale and limited field reconnaissance. Following this initial route alternatives selection, the alternative pipeline alignments were identified and evaluated based on engineering and environmental factors as indicated in Table 2-2. The following steps were also completed:

- Completion of an environmental screening report (with a view to identifying major environmental issues for input into the initial alignments considered) in fall 2012;
- Collection of project-specific aerial photography survey in November 2012;
- Field data collection through the Fall of 2012 and Spring of 2013 (flora and fauna, species at risk and of concern, and cultural resources);
- Detailed site reconnaissance in the Fall of 2012 through to Spring of 2013;
- Stakeholder and landowner consultation in the Fall of 2012 through to Spring of 2013;
- Several helicopter overflight reconnaissance in the Fall of 2012;
- Geotechnical investigations including boreholes and test pits and wetland probing from January to June 2013; and
- Topographic surveying to gather location and elevation data required for the design of the system from January to May 2013.

Pre-construction activities, such as surveying and geotechnical, are completed in accordance with the EPP (e.g., EP-09-1030 Pre-Construction Activities).

Routing evaluations were completed on an iterative basis, taking into account the information obtained during the execution of the above-described steps, and were based on the factors listed in **Table 2-2**.

Table 2-2 Factors Influencing Preferred and Alternate Alignment Evaluation

Factors	Rationale
Ease of access and proximity to M&NP mainline.	The location of the connecting point to the M&NP pipeline must have suitable road access and power supply. Potential locations were discussed between M&NP and Heritage Gas. The location selected is the existing M&NP valve station site at West River East Side Road in Limerock.
Impact on properties and land use	As much as possible, impact on properties was minimized. Measures considered include: placement of pipeline route along edge of properties; avoidance of incompatible land uses.
Pipeline length	The total length of pipe was considered from both cost and environmental perspectives. Cost considerations were taken into account, which is not always associated with the shortest route.

Factors	Rationale
	Shorter lengths reduce the amount of land disturbed during construction.
Preference for locating pipeline in existing corridors or other already disturbed areas	As much as possible, existing corridors were used to reduce ecological and socio-economic effects. Paralleling existing utilities (such as power utility, railway or roadway corridors, was a priority in the alternate route selection.
Avoidance of known environmentally sensitive areas and factors such as wetlands and sensitive water habitats	Where possible, significant environmental factors, such as wetlands, were avoided to the maximum extent possible. The number of watercourse crossings was minimized. In the design, Heritage Gas made a decision to avoid all direct alteration during pipeline installation by drilling under watercourses and wetlands.
Interaction with existing infrastructure	There is minimal interaction with municipal infrastructure for all routes considered. All routes cross a similar number of highways and railways.
Timing, Availability and Cost of Land Access	This factor included estimates of time needed to contact private land owners and negotiate easements.
Constructability and Capital Costs	All of the routes were evaluated based on their constructability. All other factors being equal, routes with the lowest overall capital costs were preferred.

The underlying approach taken by Heritage Gas in selecting an alignment for the pipeline was to minimize the impact on the environment and on landowners through avoidance. The preferred and alternate alignments were refined based on consultation with the public, regulatory authorities and stakeholders and study team review. Comments from all levels of government, community groups, the general public and other stakeholders were considered during alignment selection. The detailed evaluation of alternatives is presented in Section 2.4.4 below.

When further evaluations are conducted, a final review of the alignment, based on the factors in Table 2-3, either confirms the suitability of the selection, or leads to the modification of the selection as follows:

- a small section of the alignment is re-evaluated and adjusted to suit the physical characteristics of the site specific conditions; or,
- an alignment preference is identified by landowners, regulators and/or stakeholders.

The final stage in the process is the detailed design of the preferred alignment. At this stage, detailed survey information is collected, and the alignment is fully defined. The detailed design, as well as consultations that are a part of the approvals process, may result in minor refinements to the alignment of particular pipeline sections.

The environmental and engineering factors influencing detailed design are listed in **Table 2-3**.

Table 2-3 Factors Influencing Alignment Evaluation

Factors	Rationale
Soils – Erodible Soils	Areas of highly erodible soils require additional erosion control. Route minimizes water crossings.
Constructability	Options for alignment and construction methods that limit disturbance are preferred.

Factors	Rationale
Easement Access	Ability to readily access work site. Requires evenly spaced access roads, maximizing use of existing roads.
Rare Plants	Route adjusted to avoid.
Critical Habitats	Route adjusted to avoid.
Acid Bedrock	Not applicable.
Archaeology	An archaeology model has been developed to identify areas of high, medium and low probability of occurrence of cultural heritage resources.
Fish and Aquatic Habitat	Avoidance of sensitive fish and aquatic habitat where possible.
Wetlands	Location of wetlands will influence the location of the pipeline in the easement. Designated Wetlands or Special Significance are avoided.

2.4.4 Route Alternatives Considered

In any pipeline alignment selection process a multiplicity of routing options may be considered. Factors influencing alternative route selection and evaluation are described above. For this Project, four alternate routes were considered, which are presented graphically in **Figures 2-3 and 2-4.**

One determinant common to all alternate routes is the preference for following existing utility, roadway or railway corridors. The major power utility corridor that runs from the Trenton Generating Station southwest to Truro was identified as a significant fitting corridor for the proposed pipeline. As a result, all routes considered follow this corridor for approximately a third of the alignment distance from West River East Side Road to Douglas Road.

"Existing NSP alignment followed by pipeline route"

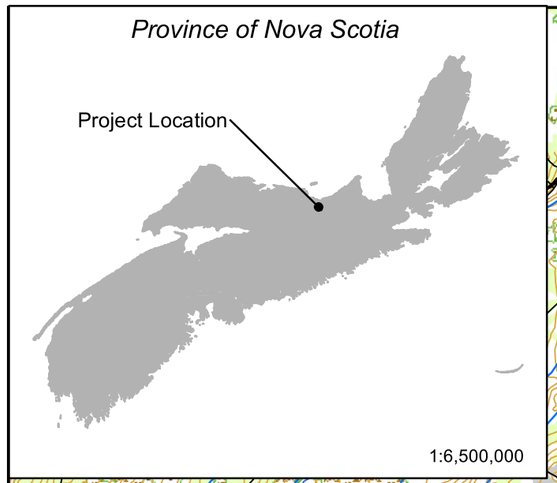


Figure 2-3
Constraints Mapping
Pictou County Natural Gas Pipeline

Legend

- Contour Interval (5m)
- Railroad
- Road
- Collector
- Expressway / Highway
- Preferred Route
- Alternate Route 1
- Alternate Route 2
- Alternate Route 3
- Future Expansion Route
- M&NP
- Utility
- Watercourses
- Waterbody
- NSDNR Wetlands
- Tree Plantation
- Cut Over/Clear Cut
- Agriculture
- Built Up Area
- Gravel Pit
- Mine Site, Landfill or other Brownfield
- First Nations Lands (Pictou Landing)
- Abercrombie Wildlife Management Area
- Park Area

Significant Wildlife Habitats

- Deer Wintering Habitat
- Migratory Bird Habitat
- Other Habitat*
- Species at Risk Habitat

* Significant Habitats (NSDNR)

Site ID	Common Name
PI140	Wood Turtle
PI185	Greater Scaup
PI191	Bald Eagle
PI193	Bald Eagle
PI194	Bald Eagle
PI197	Bald Eagle
PI204	Bald Eagle

Heritage Gas

DILLON CONSULTING

0 0.5 1 km

SCALE 1:50,000 STATUS: DRAFT DATE: 06/27/13

Data Sources: NSDNR, GeoNova, Heritage Gas, NRC, 2012-2013 field surveys

Projection: NAD_1983_CSRS_UTN_20N

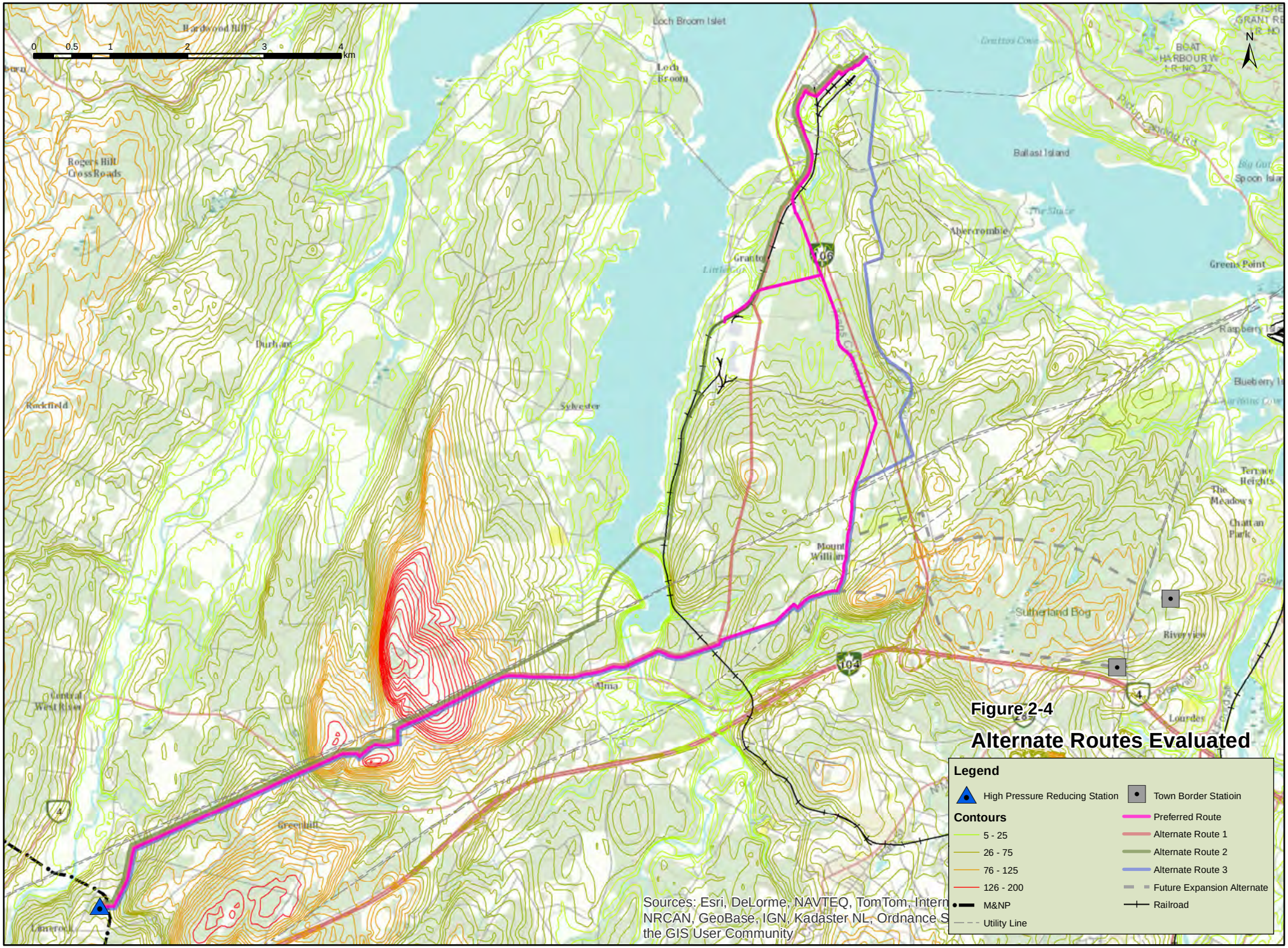


Figure 2-4

Alternate Routes Evaluated

Another critical determinant for alternate route selection is the crossing location at major watercourses, which in this case is primarily Middle River. The power corridor referred to above crosses Middle River at a location that is wide and has extremely steep banks; it was deemed impassable by a pipeline, even with the use of HDD. Therefore, only two Middle River crossing locations were deemed suitable:

(i) North of the power corridor (green route);

(ii) South of the power corridor, immediately north of Highway 4 (red, magenta and blue routes).

From Middle River on, again consideration of existing corridors determined the selection of alternatives, with primary consideration being given to: the Cape Breton & Central Nova Scotia Railway (green route to Michelin and Northern Pulp); the abandoned Intercolonial railway and Highway 6 (magenta route to Northern Pulp); and the landfill road connecting the Trenton Connector to Abercrombie Road (blue route). In addition, the red route was selected as the most direct cross-country route to Michelin.

Avoidance of key ecological or known cultural impacts is the next factor of critical importance. Avoidance of wet areas (i.e., high density of wetlands or watercourse) is a major factor considered. Designated Wetlands of Special Significance are avoided.

When all potential routes are identified, they are assessed against a number of criteria including ecological, cultural, social, and constructability factors as listed in Table 2-2 above. With regard to constructability, the number of major crossings (i.e., watercourse, highway, or railway) is an important consideration as it has the potential to impact existing uses, duration of construction, and costs.

One key element in both route selection and evaluation is the willingness of landowners to enter into easement agreements with Heritage Gas. Initial contacts identify landowners who may pose a challenge (for example, by insisting on complex or onerous access conditions or because they are “absentee” landowners who cannot be reached). Heritage Gas also attempts to avoid parcels that are protected (examples of such are the Greenhill Provincial Park and the Abercombie Wildlife Management Area). Compatibility with existing land uses is also a factor of considerable importance. Therefore, to the extent that it is possible, the alternate route selection reflects the potential alignments that are deemed most feasible considering landowner / land use factors.

Finally, one last determining factor considered is the progress of discussions with potential customers. While initially both Northern Pulp and Michelin were deemed to have equal potential of entering into a service agreement with Heritage Gas, at the Project definition progressed it became evident that Northern Pulp’s internal approval process would be faster and that they would become the first natural gas customer in Pictou County. Accordingly, preference was given to those routes that were the most relevant to bring natural gas to Northern Pulp. Ease of future expansions into New Glasgow, Stellarton and Trenton was also considered.

Taking into account all of the above factors, the four routing alternatives were evaluated and ranked as presented in **Table 2-4** below. The top two ranked routing options were retained as

the subject of a detailed evaluation of environmental and cultural factors as presented in Section 4.0 of the EA.

Table 2-4 Comparison of Routing Alternatives

	Use of Existing Corridors	Crossing Location Middle River	Ecological Cultural Impact	Impact on Protected Areas	Interaction with Landowners / Land Use	Construct-ability and Cost	Ease of Future Expansion	Total Rating	Ranking
Green Route	4	2	3	5	3	3	3	23	4
Red Route	3	4	3	5	3	5	4	27	2
Magenta Route	5	4	4	5	4	4	5	31	1
Blue Route	4	4	3	2	3	3	5	24	3

Where ratings are given in accordance with the following scale:

- 5: Very Good
- 4: Good
- 3: Fair
- 2: Poor
- 1: Unacceptable

2.4.5 Siting of Facilities

Three types of facilities will be sited as components of the project:

1) High pressure reducing station (HPRS);
2) Pressure reducing station (PRS); and
3) Isolation valves.

The HPRS was selected to be at the existing isolation valve station on the M&NP pipeline. In discussion with M&NP, the intersection of the M&NP pipeline with the West River East Side Road in Limerock was deemed to be the preferred location. Benefits of this location are:

- Closest to potential customers;
- Synergy and re-use of portions of the existing facilities;
- Lesser impact on environment / land use because the area is already disrupted by existing above-ground facilities; and;
- Existing land parcel owned by M&NP suitable for hosting the proposed CTS and HPRS facilities.

A summary of the approach utilized for the selection of preferred sites for the HPRS is presented below.

The following preferred characteristics were applied in selecting the preferred HPRS:

- Located close to the M&NP transmission pipeline and proposed CTS;
- Accessible from a public road;
- Suitable site for construction purposes (e.g., topography, avoidance of wetlands and watercourses);

- Availability/proximity to electrical power supply;
- Minimum property size of 50 m x 100 m (1.2 ha);
- Separation from distance from nearby dwellings;
- Located within the boundaries of a single existing property;
- Compatibility with adjacent land uses (e.g., forestry, agriculture); and,
- Compatible with zoning regulations.

The potential locations for the PRS at the signed customer location were identified in discussions with Northern Pulp. These locations were then field-truthed and a preferred candidate location was identified. The PRS locations are typically within existing developed industrial land of the customer. A similar process has been initiated with Michelin.

Two isolation valve locations are currently being proposed: the first one is located near the end of the 219.1 mm diameter section of the pipeline (i.e., synergestic with the location of the take-off point for the potential future expansion to New Glasgow, Stellarton and Trenton); and the second one located near the take-off to the Michelin pipeline, that will enable the isolation of either the Northern Pulp or the Michelin service.

2.5 Construction

2.5.1 Overview

This section summarizes typical pipeline construction activities and general environmental protection measures. Detailed environmental protection measures for each activity are detailed in the Heritage Gas EPP. Site specific measures will be detailed on environmental construction plans to be prepared for the project as part of the detailed design.

Heritage Gas is committed to protecting the environment throughout all phases of its operations. Environmental protection is considered to be both a corporate and personal responsibility for Heritage Gas and all of its employees. Accordingly, environmental protection has been incorporated into the construction phase where there is the most opportunity of the Project to interact with the environment.

This section outlines the construction management approaches, highlights key equipment used, presents construction sequence, and details the activities. As control of erosion, sediment and construction drainage is an integral aspect to protecting the environment in most construction activities, this aspect is examined in more detail. Finally the proposed schedule is presented with focus on construction but in context of initial planning and field work.

"Typical Heritage Gas pipeline under construction"

2.5.2 Construction Management

Key activities in the management of construction are summarized in point form below.

Project Controls

- the construction of pipelines and components is managed to meet the budget, schedule and environmental management objectives set by Heritage Gas.

Management and Coordination

- construction logistics are managed with particular regard to construction staging, materials delivery, materials control, temporary facilities, emergency response during construction, and related factors;
- contractors are coordinated and administered to meet their individual targets and objectives; and
- programs and procedures including environmental protection, construction safety and emergency response are applied to meet overall company goals, objectives and regulatory requirements.

Communications

- the public and affected property owners are kept informed of construction activities in a timely manner; and,
- regulators and other stakeholders are kept informed of issues arising during construction.

Materials Quality Control

- materials are received, and accepted from suppliers;
- measures for material inventory control and storage are implemented; and

- delivery of material to contractors is coordinated and controlled.

Installation Quality Control

- standards and specifications are applied during construction;
- design changes are reviewed and receive appropriate approval and sign-off; and,
- quality control procedures are implemented to verify that construction proceeds in accordance with Heritage Gas' specified requirements.

Quality Assurance/Inspection

- inspection, including verification of welding, pipe coating and pressure testing, is conducted as part of the overall quality assurance program for the project;
- the constructed project meets specified Heritage Gas and CSA Z662 requirements;
- the constructed project meets the terms and conditions of the NSUARB Permit to Construct; and
- appropriate quality record documentation is maintained to demonstrate the above.

Environmental Protection Compliance

- the environmental protection program, which includes monitoring plans, environmental protection plans, environmental construction plans, emergency response plans, contingency plans, and auditing and reporting mechanisms, are applied in accordance with Heritage Gas' procedures and specified requirements;
- the EPP addresses detailed aspects of construction such as sediment and erosion control, cultural resource management, handling of contaminated soils, crossing watercourses, and construction monitoring;
- environmental compliance is confirmed and measured against regulatory requirements, Terms and Conditions of Approvals, and the EPP during the construction phase; and
- procedures are put in place for conducting corrective actions in the event that non-compliance is discovered during construction.

Documentation and Records

- relevant data from the quality assurance program is maintained to demonstrate compliance with standard specifications; examples of information contained under the program are: pipe material testing; material certificates; shop and field testing results; and verification of operating pressures;
- documentation and records necessary to demonstrate conformance with the field joining program are maintained and include: welders certificates; inspectors certificates; signed-off welding procedures; non-destructive testing results (X-rays, Magnetic Particle Imaging (MPI) or other methods); destructive testing results (if any); and, description of remedial measures and repairs;
- documentation and records demonstrating conformance with the field testing program are maintained, including descriptions of the following: proof of permits and approvals; calibration of testing equipment; and pressure testing results (description of test medium, pressure and duration); and,
- the construction team maintains a library of project records that may include such items as project photographs and video-recordings, copies of permits, inventory control records,

safety records, design changes, contemplated change orders, and other records pertaining to construction activities.

Occupational Health & Safety and Emergency Response

- Heritage Gas has corporate manuals on Emergency Response and occupational health and safety, which will be reviewed for use in Pictou County and site specific aspects, e.g., contact information provided separately; and
- From an environmental perspective, spill response protocols are described for major and minor incidents; this is well integrated with the EPP.

Pre-commissioning and Hand-off

- the system is pre-commissioned and handed-off to the operation team of Heritage Gas; and,
- as-built information is collected to meet the requirements of the record retention program and included in the Heritage Gas geographical information system (GIS).

2.5.3 Construction Equipment

Although decisions on specific types of equipment have not been made, some equipment used for construction of natural gas pipelines are described below.

Clearing Equipment

Clearing equipment that will be used includes: skidders, forwarders, feller bunchers, harvesters, log trucks, forestry mowers, chain saws and chippers.

Excavation

Excavators range from 5 to 40 tonne machines. These machines will be outfitted with root rakes or buckets for grade and ditch excavation.

Excavated soil is typically stored next to the trench and reinstated as backfill in the trench line. Unsuitable or excess soil will be loaded into trucks for disposal off-site.

Excavators used on the Project will be diesel driven, with noise characteristics similar to equipment used in excavation of water and sewer lines, or house foundation excavation. Trench widths will be approximately 400-600 mm. Other bucket widths can be used if required.

Side Booms

Also referred to as “pipe layers”, these units are constructed on a special purpose crawler frame and have a boom and cable sling projecting off the side. The equipment is used for moving and/or placing of the pipe into the trench.

The side booms are diesel driven and can be expected to generate noise levels similar to conventional construction equipment.

Rubber Tired Backhoes

Backhoes function as a small capacity excavator, or a small capacity front end loader. The backhoe will be used primarily for site clean-up and trench backfilling. Backhoes are diesel powered but generate less noise than the other equipment described.

Horizontal Directional Drills (HDD)

As the size and depth of drill shots will vary, different drill sizes will be used. The maximum drill length for this project is expected to be approximately 600m and some areas will be drilling through rock based on the depth and geology. The drill head used will be interchanged depending on the subsurface conditions. Use of drilling fluid (primarily a bentonite and water slurry) is to lubricate and cool the drill head as well as stabilize the borehole itself.

Vacuum Truck (Hydrovac)

A vacuum truck will be available as necessary to clean up and collect the drilling fluids for the following duties:

- As part of standard drilling operations, collect the drilling fluids to return for recycling and take them to a pre-approved disposal site;
- Emergency response at crossings with sensitivity in the event of an unplanned release, e.g., surface discharge or release from the containment berm; and
- For confirming locations of underground infrastructure with minimal disruption (i.e., "daylighting").

2.5.4 Construction Sequence

A number of crews will be assigned to the Project:

- Clearing crew, normally under a separate contract ahead of the pipeline construction activities;
- Main pipeline spread with primary responsibility for installation of the pipeline, including:
  - right-of-way crew(s) who are responsible for environmental protection measures, grading, clean-up and stabilization
  - ditching crew(s) who are responsible for trenching
  - welding and X-ray inspection crew(s)
  - lowering-in and backfilling crew(s);
- One or more 'trenchless' crew(s) for completing crossings using HDD; and
- Tie-in crew(s) for connections at crossings and above-ground facilities.

While the pipeline is a linear project, this Project contains a number of obstacles which will be drilled, such as all watercourses and wetlands, and across transportation corridors. Accordingly, the flow of work will be driven by the sequence of installation of crossings of these obstacles, and may not necessarily be linear. Logistics of the work will also consider environmental protection to ensure that open areas are minimized and restored as soon as practical and that weather is considered in the ongoing planning.

At the completion of all construction and tie-ins, final inspection, pressure testing, and activation will be completed in accordance with conditions of NSUARB.

2.5.5 Construction Activities

The following summarizes construction activities associated with the Project with the brief descriptions of mitigative measures that will be implemented to protect the environment. All work will be completed in accordance with the EPP; in the text below, specific sections of the EPP are referenced. As part of final design, a site-specific ECP will highlight specific applications of mitigative measures, in particular where requirements exceed those of the EPP.

Heritage Gas will continue to work with NSE as the final design of the Project evolves to ensure that the proposed methods and exact locations of work, including crossings, meet the intent of Heritage Gas to avoid altering wetlands and watercourses or affecting fish habitat or priority species habitat during the implementation of the proposed Project.

Clearing

The easement will be cleared of brush and timber to a maximum cleared width of 20 m. In some locations, the easement will be narrower for environmental or land reasons. As much of the alignment uses existing corridors, the area to be cleared has been minimized (approximately 27ha in total). Access roads use existing roads where possible to minimize required clearing area. HDD set up area do not exceed 50m x 50m in size, these are often smaller and use existing disturbed areas. Area to be cleared for ancillary feature and above ground facilities is estimated to be less than 1% of the total area to be cleared. The easement is cleared mechanically with the exception of a minimum 10 m buffer zone on either side of watercourse crossings. Within this buffer zone, vegetation will be cleared by hand or machine at the minimum width to allow for the travel way to be constructed. This work will be completed just prior to the placement of temporary bridges.

Application of site-specific sediment and erosion control measures is required whenever a 30m buffer is not maintained to watercourses and wetlands; this requirement will be identified in the ECP with site-specific recommendations. Sediment and erosion control measures proposed by the Contractor are subject to approval of Heritage Gas.

Merchantable timber will be salvaged and the remaining debris disposed of in accordance with landowner agreements and the EPP. In addition, Heritage Gas will retain timber suitable for construction of a corduroy base where additional stability is required for movement of construction equipment. Slash that is not suitable for corduroy will be mulched on site and salvaged with top soil/duff; no burning will be permitted.

The EPP addresses this work, including but not limited to:

- EP-09-3020 Clearing and Grubbing, and
- EP-09-3100 Working in and Around a Watercourse or Wetland.

Grading

Environmental control measures such as sediment fencing, ditching diversion, or other site-specific erosion and sediment control measures will be installed by the crews prior to commencement of grading activities. Where required, graded areas will be grubbed and topsoil stripped and stockpiled for reuse. Stumps will be buried at pre-selected locations spaced evenly

along the alignment and away from watercourses. Selection of these locations will be done during detailed design in compliance with leaf and yard waste disposal as defined in the Nova Scotia Solid Waste-Resource Management Regulations.

Temporary access road structures over select watercourses are proposed for equipment access. The specific design will consider watercourse physical character, environmental sensitivity, geotechnical issues and technical aspects associated with vehicle use. Vehicle crossings, where required, are expected to be temporary bridges or culverts. Temporary bridges are generally used for sensitive watercourses. Currently, seven temporary bridges and one culvert are proposed to facilitate vehicle crossings. The work will be designed and completed in accordance with Nova Scotia Watercourse Alteration Specifications (2006). Sediment and erosion control will be installed prior to topsoil stripping within 30 m of the watercourse as appropriate depending on the topography, weather, and sensitivity of the specific location.

The EPP addresses this work, including but not limited to:

- EP-09-3010 Management of Erosion, Sediment and Construction Drainage;
- EP-09-3020 Clearing and Grubbing; and
- EP-09-3100 Working in and Around a Watercourse or Wetland.

Stringing and Welding

The pipe will be laid out along the pipeline route. The pipe will be set on skids or pipe cones, bent to conform to the surface topography and welded into longer sections. Welded joints will be inspected visually and by non-destructive testing (i.e., via x-ray). Weld joints are coated and the entire length of pipeline coating will be inspected for coating faults. Any coating faults will be repaired prior to the pipe being lowered into the trench excavation.

The EPP addresses this work, including but not limited to:

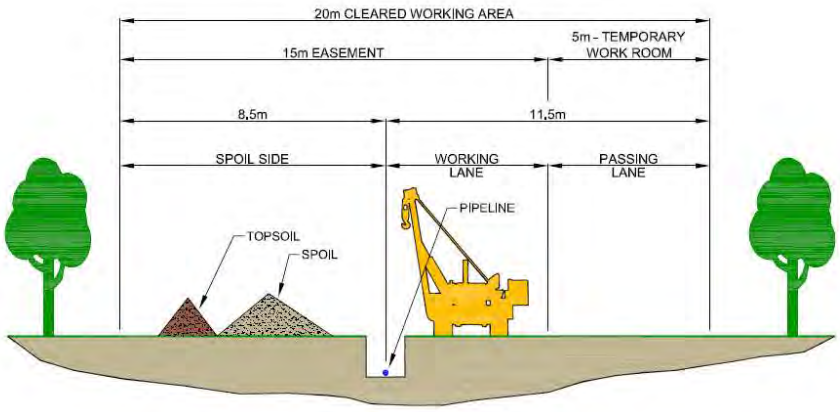
- EP-09-3060 Laydown Areas.

Trench Excavation

Using an excavator, a trench will be excavated to provide adequate ground cover depth as specified by Heritage Gas, but not less than the cover specified under CSA Z662 (Refer to Table 2-1). Trench widths will be approximately 400-600 mm. If bedrock is encountered, use of a rock breaker may be required. It is not anticipated that any rock blasting will be completed as part of the Project.

A typical cross-section of the easement is provided in **Figure 2-5**.

Figure 2-5 Typical Easement Cross-section



When water accumulates in the open trench, the trenches will be dewatered to a filter bag that is located, where possible, in a vegetated area removed from watercourses to prevent sediment laden runoff from entering watercourses as detailed in the EPP. Sediment and erosion control will be in place as appropriate as per the EPP given proposed work and site specific conditions.

Cultural heritage resource is the collective term given to artifacts, buildings, features and landscapes that reflect past human activities. Archaeologically identified resources can take the form of First Nations campsites, fishing stations, burial sites, as well as the remains of historic farmsteads, residential or commercial buildings, and urban infrastructure. Existing historic buildings and landscapes, including cemeteries, are also considered cultural heritage resources. In addition to these observable resources, locations of spiritual and/or cultural significance to First Nations, are also recognized as part of the collective heritage. An archaeological assessment was completed for this Project (Appendix B); this is further explained in Section 4.0. As per the EPP, the Contractor will be instructed and aware to notify Heritage Gas who will engage our archaeologist who has a permit with the Special Places Program to respond should suspected artifacts be found during construction.

Heritage Gas will manage work such that only limited topsoil mixing results during grading, trenching, backfilling and cleanup operations. The risk of mixing developed soil profiles is possible in areas where agricultural and forestry soils will be encountered. The proposed pipeline construction and reclamation practices incorporate a range of standard mitigation measures to retain soil productivity and capability. The conservation of topsoil is important for the successful restoration of certain soils that may be disturbed by construction; for example, where agricultural land is used for pipeline easement, topsoil will be salvaged and stored separately from subsoil. In forested areas, topsoil and duff material will be salvaged and redistributed

during clean-up; however, discussions with landowners will be conducted to determine and specific topsoil stripping requirements.

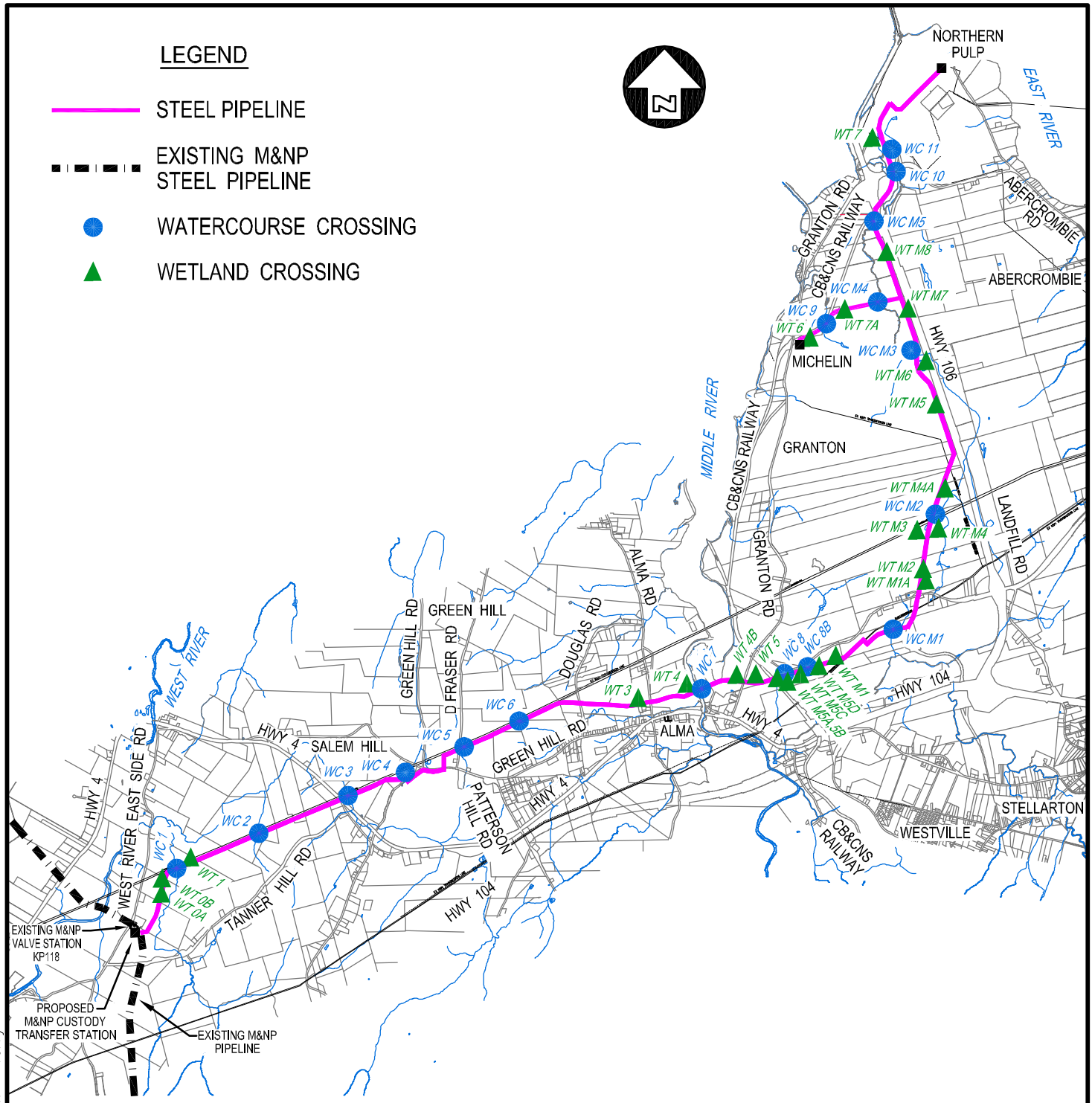
Soil contamination resulting from former land uses may also exist at specific locations along the alignment, particularly adjacent to developed areas. Where contamination is suspected, test pits will be excavated to establish the nature and extent of the impacted soils. Along the proposed alignment, the potential for contaminated soils is considered high along the abandoned rail line. Results of analysis for soil sampled from test pits showed some presence of heavy end petroleum and polycyclic aromatic hydrocarbons (PAHs); however, all were in commercial guidelines (refer to geotechnical report in Appendix C). No excess soil from this location will be removed from the site and levels of contamination are within guidelines. As per the EPP, a process is in place in any location where visual or olfactory signs of soil contamination exist.

The EPP addresses this work, including but not limited to:

- EP-09-2060 Discovery of Cultural Heritage Resources
- EP-09-2070 Discovery of Suspect Soils
- EP-09-3010 Management of Erosion, Sediment and Construction Drainage,
- EP-09-3030 Trenching, Soil Storage and Topsoil Management,
- EP-09-3060 Laydown Areas, and
- EP-09-3100 Working in and Around a Watercourse or Wetland.

Watercourse and Wetland Crossings

As part of construction of the Project, the pipeline is proposed to cross 17 watercourses and 22 wetlands. These are shown on Figure 2-6. Heritage Gas has committed to cross watercourses by using horizontal directional drilling (HDD) in all cases except for one. In this case, the use of a dry crossing to install a culvert as part of pipeline installation was recommended by NSE; this location is upstream of a watercourse where a manmade pond is draining over a depression in an abandoned rail. This use of HDD will avoid direct alteration of watercourses and wetlands during pipeline installation. **Figure 2-6** shows crossing under Wetlands and Watercourses.



CROSSING UNDER WETLANDS & WATERCOURSES

FIGURE 2-6

DESIGN:	DRAWN:	SCALE:
T.L.M.	T.L.M.	1:70,000

0 700 1400m

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The detailed design of each drill for all the watercourse and wetland crossings will consider the size of the watercourse, potential sensitivities and resource/land uses, as well as on the physical characteristics of the area including: environmental sensitivity, bedrock, soil, local topography, geotechnical characteristics, working space, and crossing approaches. In all cases, the drill entry and exit location, drill pathway, including depth, and set up, including sump for drilling fluid and vacuum truck stand by, will be determined in consideration of environmental concerns. Where specific environmental protection measures are proposed in select sites, this will be included in the construction drawings and the ECP, as appropriate.

Horizontal Directional Drilling (HDD)

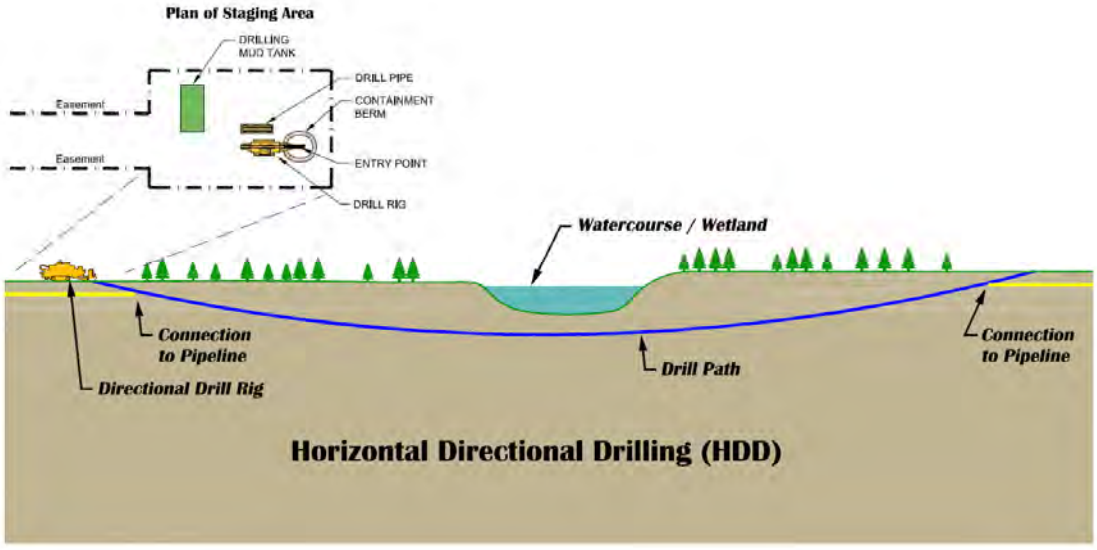
With HDD, a drilling rig is used to directionally drill a path beneath a watercourse from a location on one bank to a location on the opposite bank. It can be used for any size watercourse, and for this Project, it is proposed for all watercourse and wetland crossings, including Middle River.

The two-stage process involves the drilling of a small diameter pilot hole along a designated directional path, followed by the enlarging of the pilot hole by reaming to a diameter suitable to accommodate the proposed pipeline. A pre-welded section pipe string is then pulled through the drilled hole. Drilling fluid is used in this process; it is primarily a mixture of water and bentonite, i.e., clay. The drilling contractor will manage and monitor drilling fluid as the work progresses.

The technical feasibility of a HDD installation is determined by the distance to be drilled, the diameter of the pipeline, and the subsurface conditions. Geotechnical information is required to determine whether HDD is feasible. Inconsistent bedrock and overburden conditions present impediments to the use of HDD technology.

A typical illustration of this crossing method is illustrated on **Figure 2-7**. The work space requirements are generally larger than those associated with dry crossings due to the requirement to site additional temporary workspace for spoil stockpiling, de-watering activities, and erosion and sediment control measures. The work space can be as large as 10m wide and 15m long on each side of, and set back from the watercourse as per the EPP. However, these dimensions are dependent upon the site topography. Typically, a HDD crossing of the largest size contemplated on this Project can be completed within 2 to 4 weeks including equipment set up and take down, e.g., Middle River. The more typical proposed drills are smaller in length and shallower, e.g., small tributary crossing, etc. These are expected to take 1 -4 days including set-up and take down.

Figure 2-7 Typical HDD Set Up



HDD has many environmental advantages. Since the entry and exit points are set back from the watercourse and wetlands to be crossed, the stream bed and generally the stream banks and approach slopes remain undisturbed. This reduces the potential for instream sediment generation and, at the same time, maintains stream flow and fish passage. An additional advantage of the maintenance of a buffer on each side of the watercourse, is that it will provide a natural barrier to unauthorized vehicles and minimize the release of erodible sediments into watercourses from both construction and off highway vehicles.

This method requires suitable substrate to be successful. Large boulders, unconsolidated material and inconsistent grain size/texture decrease the success of this method. However consistent particle size is less critical for boring than for HDD. Impermeable stream bottom and underlying material is preferred. Heritage Gas' knowledge of the geotechnical conditions along the pipeline route indicates that HDD will be technically feasible; this is based on geotechnical programs (Appendix C).

The geotechnical information will be used by the drilling Contractor to assist in minimizing risk of release of drilling fluids (i.e., a "frac out"). Heritage Gas requires a minimum of 1.5m depth of cover over the drill path under the known bottom of the watercourse or wetland; the drill path will often be deeper. As part of the geotechnical investigation, depths of wetlands were probed.

The HDD crossings proposed will be completed in accordance with the EPP, site specific ECPs to be completed with the final design, and the DFO Operational Statement for Directional Drilling.

The EPP addresses this work, including but not limited to:

- EP-09-3010 Management of Erosion, Sediment and Construction Drainage,
- EP-09-3090 Construction of Water Crossings, and
- EP-09-3100 Working in and Around a Watercourse or Wetland.

Equipment Access

At present, seven temporary bridges are proposed and one culvert installed for equipment access over watercourses and, in the case of the culvert installation, to facilitate drainage. The specific methods of each watercourse crossing (via temporary bridges and a culvert) will be confirmed during the detailed design of the pipeline and will be specified in its applications for approval for the watercourse alteration. The Nova Scotia Watercourse Alteration Specifications (2006) will be followed.

Any instream work (i.e., the proposed culvert installation) and the installation of temporary bridge structures will be undertaken within the June 1 to September 30 construction window, when aquatic life is least sensitive to potential construction effects. Given the anticipated start of construction in early September pending EA approval, it is expected that the temporary bridges and culvert will be installed by mid-September which is preferable to late September. In the unlikely event, that Heritage Gas requires construction outside this period, Heritage Gas will develop a specific crossing work plan for approval from NSE and DFO.

Heritage Gas is currently proposing a linear development across wetlands with lower sensitivity to facilitate equipment access. This is currently proposed in twelve locations. The work is in accordance with the Nova Scotia Wetland Conservation Policy. Any work will be completed to minimize area and location selected that is less sensitive. This work is only proposed in shrub or wooded swamps that are not classified as "Wetlands of Special Significance" and at a width of the linear corridor that is under 10m wide and under 600 m^2 in area. The linear developments will be constructed using swamp mats or as corduroy roads. Care will be taken to minimize permanent disturbance and temporary effects, e.g., rutting. Removal of access roads will be determined with NSE on a case by case basis.

These proposed plans have been and will continue to be under discussion with staff at the local NSE office. The work will be in accordance with the EPP. Site specific measures for watercourse crossing for equipment access will be outlined during detailed design and submitted with the Application for Approval. While no NSE approval is expected to be required for wetland crossings as it is the intent to be within the exemptions in the Nova Scotia Wetland Conservation Policy to minimize environmental effect, the specific approaches to design, installation and restoration of the linear access road will also continue to be discussed with NSE as appropriate.

The EPP addresses this work, including but not limited to:

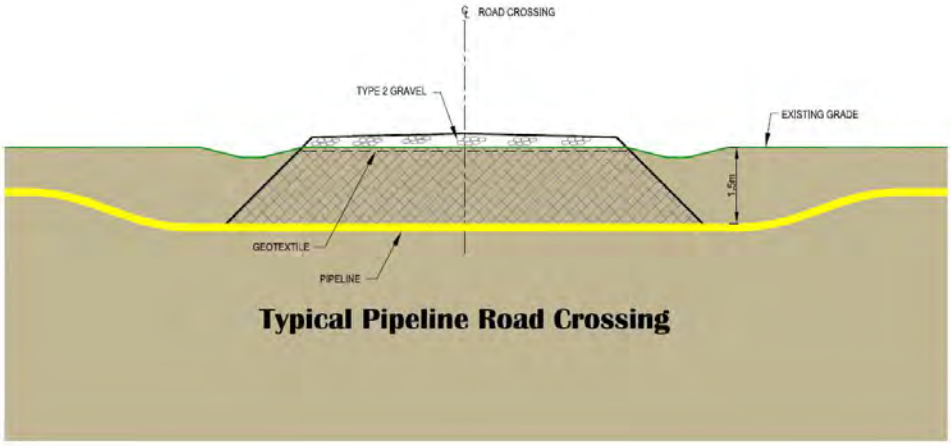
- EP-09-3010 Management of Erosion, Sediment and Construction Drainage,
- EP-09-3090 Construction of Water Crossings, and
- EP-09-3100 Working in and Around a Watercourse or Wetland.

Installation and Backfill

The pipe will be lowered into the trench and to the fullest extent possible backfilled with excavated soil. Where the backfill material is unsuitable, sand padding will be used around the pipeline. The trench will be compacted to restore the easement to the previous grade and to minimize ponding over the trench. In agricultural lands, topsoil and subsoil will be placed separately to minimize mixing and potential loss of productivity.

The pipeline route crosses several roadways. **Figure 2-8** shows the typical installation of the pipeline within the context of a road crossing.

Figure 2-8 Typical Pipeline Road Crossing



The EPP addresses this work, including but not limited to:

- EP-09-3010 Management of Erosion, Sediment and Construction Drainage, and
- EP-09-3030 Trenching, Spoil Storage and Topsoil Management.

Cleanup and Stabilization

Following construction, disturbed areas will be restored and stabilized in accordance with Heritage Gas practice and landowner agreements. Previously graded areas will be recontoured to match pre-construction conditions, where practicable. Permanent diversion berms and drainage channels will be left in place where required to control run-off and minimize erosion as appropriate. Temporary bridges, rock used to stabilize approaches will be placed on disturbed areas adjacent to the watercourse or placed on the banks to provide scour protection. Topsoil, where previously segregated, will be graded out onto the easement and the easement will be seeded. Sediment fencing will remain in areas adjacent to watercourses and wetlands until the easement vegetation has been re-established

Construction related materials such as survey staking, temporary crossings, and pallets will be removed from the easement. Throughout construction, a minor amount of liquid and solid wastes is generated. Liquid waste produced includes oils, solvents, grease, fuels and sewage. Liquid wastes such as fuel, oil and solvents will be recycled or reused wherever possible and the remaining materials disposed of at an approved facility. Waste storage will be minimized by prompt removal of waste following equipment servicing. However, if liquid waste storage is required, the storage areas will be located following the requirements for fuel and lubrication storage. Portable toilet rentals will be used for construction sites; these will be serviced by the company and disposal in accordance with regulations. Solid waste produced will include materials

such as strapping, temporary fencing, bridge material, signs, containers and welding rods. Construction specifications will include requirements for litter control and management of construction wastes. Non-hazardous solid waste will be collected and disposed of at an approved facility by a licensed contractor.

The EPP addresses this work, including but not limited to:

- EP-09-2080 Waste Management;
- EP-09-3010 Management of Erosion, Sediment and Construction Drainage, and
- EP-09-3040 Site Restoration and Stabilization.

Internal Inspection and Pressure Testing

Internal inspection consists of the use of sponge or brush pigs to clean and dry the pipeline, followed by, where specified, inline inspection or "smart" pigs to confirm pipeline and weld integrity. Pigs are pushed through the pipeline using inert gas. Gauge pigs may also be used to confirm pipe diameter and detect diameter variations. For this Project, the use of smart pigs may not be required. Pressure testing of the pipeline will be required following completion of the construction and internal inspection to confirm the integrity of the pipeline under pressure prior to commissioning. The pipeline will be filled to test pressure with nitrogen and pressurized to complete the test.

Construction of the Above-Ground Facilities

The High Pressure Regulating Station (HPRS) will be constructed adjacent to the M&NP existing facility to regulate the pressure where natural gas is transferred from the M&NP's CTS outlet to Heritage Gas' high pressure steel pipeline. Therefore, siting is within compatible land use.

The site will be cleared and levelled in accordance with the EPP. Fabrication of the above-ground facilities will partially occur off-site and some equipment will be delivered to the station site pre-assembled. The assembly of the above-ground facilities will be completed and connected to the underground piping onsite.

Facilities within the regulator station may include: pressure regulating; heating; over pressure protection relief; telemetry (pressure and temperature measurements); power and telecommunications supply (optional); odourant addition (permanent); filtering (permanent); and, isolation valving.

Standard mitigation for the construction of the Pressure Reduction Station (PRS) at each customer site will be the same as the HPRS.

The EPP addresses this work, including but not limited to:

- EP-09-3010 Management of Erosion, Sediment and Construction Drainage,
- EP-09-3020 Clearing and Grubbing, and
- EP-09-3040 Site Restoration and Stabilization.

System Commissioning and Activation

The commissioning and activation of the natural gas system will occur upon completion of construction activities and when compliance testing is satisfactory. It will be conducted by the Heritage Gas operation team. Pipelines and above ground facilities will have specific purging and activation plans developed.

The activation of the system will occur in isolated sections between valves. Natural gas will be introduced into the pipeline at a controlled rate and the system purged to remove air from the pipeline. Pressure gauges will be used on each section to monitor the pressure as the pipeline is filled. Natural gas monitors will be used at the purge points to identify when the required percentage of natural gas content has been reached. Natural gas will be flared to minimize methane release into the atmosphere.

Heritage Gas informs landowners in the vicinity of flare points such that they understand the process and are not alarmed by the potential release of odour and the noise from flaring. These impacts are temporary, normally a few hours, and controlled by Heritage Gas operation staff.

Environmental Inspections

During the work undertaken by Heritage Gas and its Contractors, site inspections will be undertaken. One component of site inspections is environmental monitoring and compliance with EPP, ECP, and legislation. Random site inspections will be undertaken by Heritage Gas' Environmental Coordinator and Project Manager. A full-time site personnel will have environmental protection as their responsibility; this individual will complete inspections regularly to ensure that mitigative controls are in place and other EPP/ECP measures are followed and maintained. Checklists will be developed for this purpose.

The EPP addresses this work, including but not limited to:

- EP-09-1040 Construction Activities.

2.5.6 Management of Sediment, Erosion and Construction Drainage

The soils in the Project area are characterized by fine-grained texture, and complex topography with occasional steep undulating and rolling slopes. (Refer to Section 4.0 for surficial soils mapping) These features, combined with frequent rainfall and runoff, result in these soils being susceptible to erosion. The major element that protects these soils against erosion is vegetation cover. When the pipe alignment is cleared of vegetation and the soil is exposed, it becomes particularly susceptible to erosion.

Given the route planning and design of the Project, many direct effects to environmental sensitivities are avoided (e.g., routing to avoid high potential areas for rare plants, use of HDD to avoid alteration of wetlands and watercourses). Yet given the sensitivity of downgradient receiving waters and the fine-grained texture of soils, proper management of sediment, erosion and construction drainage is fundamental to responsible construction of this Project.

Potential effects

The highest potential for soil erosion occurs where there is a combination of steep slopes (degree and length), low soil permeability, fine soil texture, and high rainfall rates. These areas, which are associated with sandy loam to clay loam soils with undulating to rolling topography, occur at various locations of the proposed alignment. Areas of high risk will be confirmed for the project part of detailed design activities before the commencement of construction season. Base mapping will be prepared from the aerial photography collected in 2012, and will be used to support this assessment. Site-specific mitigation measures will be addressed in the ECPs.

Runoff from the pipeline easement may enter watercourses and wetlands at intervals along the length of the pipeline construction area. Heritage Gas is committed to minimizing the impact of this runoff from activities on sensitive resources through appropriate drainage control measures in areas adjacent to wetlands and watercourses throughout the construction.

Proposed Mitigative Measures

During construction, Heritage Gas will provide sediment, erosion and construction drainage control to protect watercourses and wetlands. This protection will incorporate construction scheduling and installation of erosion and sediment control measures in accordance with Provincial guidelines, standard industry practice and the EPP.

Construction in the easement will involve clearing and grubbing of new areas. Clearing and grubbing will be kept to the minimum width possible for construction. Sediment control fencing will be installed along the edge of right-of-way until stabilization of the grubbed area. Erosion and sediment control techniques listed below will be incorporated to stabilize slopes and settle out sediment.

Buffer zones will be delineated and the use of construction equipment will be minimized within the buffer zone. Trenching will be discontinued at the buffer zone and a trench plug will be left to prevent sediment laden water from entering the watercourse. The plug will remain in place where HDD is used. Containment measures including sediment fence of berms will be used for spoil piles associated with watercourse crossings.

Trenches collect water from groundwater or surface runoff. Trenches will be dewatered during construction to minimize the potential for sediment laden water to reach a watercourse or wetland. Trench water will be pumped to a geotextile filter bag, or sediment trap prior to discharge. In some circumstances, vegetative buffer zones will be used to facilitate sediment control.

High water table or flooded conditions will require special measures for dewatering management. High water table or surface flooding can be seasonal, temporary or perennial. (Refer to mapping in Section 4.0) For seasonal conditions or temporary conditions following heavy precipitation, construction can be scheduled or delayed until water levels drop to a workable level. Where work cannot be delayed or perennial high water levels exist, special trench dewatering, erosion and sediment management practices will be designed and applied. In some locations, pipes may be lowered into a flooded trench. Design for these installations may include saddle weights to prevent pipe flotation.

Spoil piles will generally be placed in the easement. Since the trenches will be constructed and backfilled quickly, the time available for erosion of spoil piles will be limited. If spoils are stockpiled for an extended period of time, sediment fence will be installed on the downslope side. Spaces between spoil piles will be provided at predetermined intervals for drainage purposes.

Where HDD is used, the entry and exit points will be set back from the watercourse. The watercourse buffers will therefore be wider and kept intact at these locations. However, temporary access/bridge will be required to take the equipment over to the opposite side of the watercourse. The linear access will be kept as narrow as possible to minimize environmental effects.

Select Control Measures

The following is a brief summary of the erosion and sediment control measures to be used:

Buffer Zones

Buffer zones are areas that will not be grubbed until just prior to construction. Buffer zones will extend 10 m each side of the crest of the slope of a watercourse or wetland, wider where HDD is used.

Sediment Control Fence

Sediment control fencing is a sheet of geosynthetic fabric imbedded into the ground parallel to the contours. Sediment control fencing is used to filter sheet runoff. It will be used to delineate buffer zones as well as at the edges of the rights-of-way and near water courses. It can also be used around spoil piles, on toe of slopes and at intermediate locations to control siltation.

Diversion Ditches

A diversion ditch is normally constructed up slope of the work to divert clean water prior to it entering the work area. Stabilized diversion ditches will be used to minimize the amount of off-site water entering disturbed areas.

Geotextile Filter Bags

Sediment laden water is pumped into geotextile filter bags such that the water filters out and the sediment remains in the bag. These may be used where small volumes of sediment laden water require filtering.

Sediment Pond/Trap

A sediment pond or sediment trap is designed to contain flow for a period of time in order to facilitate the settling out of sediments.

Stabilization Methods

Stabilization methods will be used to minimize the potential for erosion. These include:

- hydroseed will be used for stabilization in all areas that have not been designated otherwise; tackified mulch may be applied when hydroseed is applied to slopes adjacent to watercourses outside the growing season;

- tackified straw mulch, polyethylene sheets or other geosynthetic materials may be used as a temporary stabilization method if there is an impending rainfall event or if a disturbed area cannot be permanently stabilized immediately;

- erosion control blankets are sheets of biodegradable material that are installed before or after hydroseeding; the blanket protects the seed from washing away with rain and provides soil splash protection while grasses become established; erosion control blankets may be necessary in areas with high slopes or where there are erodible soils; and,

- gravel including clear stone, surge rock or riprap may be used in ditches where the water velocities are high, in areas with high slopes and erodible soils, or to dissipate energy from stormwater discharges.

These erosion, sediment and construction drainage control measures are described in the EPP (EP-09-3010 and EP-09-9xxx Typical Environmental Detail Drawings) and, where appropriate, specified in the construction drawings and the ECP.

2.5.7 Proposed Schedule

The 17-month schedule from initial project planning to commissioning and activation is shown on **Figure 2-9**. Pending approval of the Project and release from the EA process under defined terms and conditions, construction is planned to commence with clearing shortly after the Minister's decision.

Due to project scheduling, it is likely the clearing will take place in early September and take until the end of September to complete pending outcome of the late season rare plant survey. The proposed temporary bridge crossings and the proposed culvert will be installed in September pending Part V approvals for this work.

Clearing is expected to take approximately six weeks while construction activities are expected to take three months. Commissioning and activation are expected in the first half of December.

Restoration of the pipeline easement will be ongoing following pipeline installation. Due to late season completion, it is likely that a portion of the easement will have temporary restoration areas that will be inspected and maintained until permanent restoration may be completed in the spring.

The pipeline section to Michelin is currently scheduled for 2014, but is dependent on a firm commitment from Michelin.

Work will be largely completed during daytime hours; however, night construction activity may occur as required, especially related to HDD and aboveground facility fabrication activities.

Figure 2-9 Proposed Construction Schedule

Heritage Gas - Pictou Pipeline Project Schedule		2012					2013												2014
		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Item	Activity																		
1	Preliminary Alignments & Land Access for Environmental Surveys																		
2	Landowner Negotiations																		
3	Environmental Surveys (Dillon incl habitat asst, wetland & watercourse crossing inventory)																		
4	Regulator Consultation related to Env Issues (NSE, DNR, OAA, DFO, TC, etc.)																		
5	First Nations Consultation																		
6	Archaeological Surveys (CRM)																		
7	Preferred Route Selection																		
8	Detailed Pipeline Design including Environmental Protection Measures																		
9	Consultation (stakeholders, open house, etc.)																		
10	Permit Applications - Non Environmental (NSUARB, NSTIR, M&NP, CBNS, etc.)																		
11	Review of Environmental Assessment (EA)																		
12	NSE Watercourse Approvals																		
13	Pipeline and Above Ground Facility Construction and Restoration																		
14	Activation																		
15	Final Restoration																		

Note: Some restoration / Right-of-Way clean up activities may occur in Spring 2014

2.6 Operation and Maintenance

2.6.1 Overview

The Heritage Gas operations staff will be responsible for:

- activation of the natural gas above ground facilities and coordination with Construction staff for activation of the distribution system;
- operating and monitoring the gas distribution system;
- ensuring the natural gas pipeline system is operated in accordance with applicable regulations, including Pipeline Regulations (Nova Scotia);
- maintenance of above and below ground facilities, including cathodic protection;
- monitoring and adjusting odourant levels in the system;
- locating underground pipelines as part of the Heritage Gas "Call Before You Dig" program,
- emergency response; and,
- awareness and education of local stakeholders, including natural gas customers, members of the public, and Emergency Responders.

During the operation phase, the EPP is implemented in accordance with its environmental protection mandate throughout the life of the gas distribution system. A range of standard operation and maintenance measures have been developed and documented in Heritage Gas' operating manuals. The manuals provide a cross reference to specific tools for environmental protection and system integrity during the operation phase. These tools will include patrolling, monitoring, reporting, corrective action and documentation, as well as emergency response.

2.6.2 Operations Documentation

The operations documentation listed below addresses the requirements of the Pipeline Regulations (Nova Scotia). This documentation has been previously prepared by Heritage Gas and approved by the UARB for use in other service regions. It will be reviewed and adjusted for suitability to the Pictou County Natural Gas Pipeline, and will form part of submissions to the UARB to obtain the License to Operate.

Record Retention

Types of information retained include material specifications, inspection results, test results, odourant levels, cathodic protection inspections, line repairs, pipeline emergencies, pipeline leaks and breaks, corrective actions and system maintenance activities. These requirements are stipulated within each of the manuals described herein.

Occupational Health & Safety Manual

This manual addresses health and safety during both the construction and operation stages of the project. This is discussed in more detail in Section 2.8.

Environmental Protection Plan

This manual addresses environmental protection during both the construction and operation stage of the project. Aspects such as vegetation control, waste management, spill response, incident investigation, and post-construction monitoring are outlined in the manual.

Operating & Maintenance Manual

This manual addresses the following aspects of pipeline and facility operations:

- measurement and metering;
- pressure control and over pressure protection;
- stations and valves operation and maintenance;
- leak detection
- odourization;
- ground disturbance and pipeline protection, including the "Call Before You Dig" program;
- corrosion control;
- lock-out and tag-out procedures;
- pipeline repair;
- working in gaseous environment; and,
- system commissioning and equipment calibration.

Standard Practice Instruction Manual

This manual outlines standard practice for facilities operations and system integrity. Aspects of facility operations that are included are measurement, pressure regulation, relief valves, and signage.

System integrity aspects covered by the manual include public awareness programs, pipeline hazard assessments, ground disturbance protocols, sectionalization, odourization, cathodic protection, and leak detection.

Emergency Response Manual

Heritage Gas has prepared an Emergency Response Manual for use in all service regions. This manual will be updated for implementation in the Pictou region. The manual provides information on Company organization structure and resources, and defines the roles of Heritage Gas personnel in emergency situations. It defines the types of emergencies that the Company is prepared for and the emergency response preparedness measures that are implemented. The response protocols are described for different types of potential incidents. Notification and communication procedures, both internal and with other emergency responders and EMO, are provided in the manual. Follow-up investigations and reporting requirements are described. Training requirements are also outlined.

2.6.3 Facilities Operations

Facilities within the Heritage Gas system will include:

- valve sites;
- pressure reducing stations;
- industrial customer measurement stations;
- odourization equipment;
- cathodic protection systems; and,
- SCADA system.

These facilities will be operated by Heritage Gas personnel.

The valve sites can be used to isolate or direct natural gas flow within the pipeline and to limit the loss of natural gas to the atmosphere from a break or during repair or other work on the pipeline while maintaining service to other parts of the system. Pressure reducing stations will maintain the pressure of the natural gas to meet design requirements. Industrial customer measurement stations control delivery pressure to large individual customers and provide natural gas usage measurement. Odourant addition is required to make gas leak detection possible by smell, a public and customer safety measure. Cathodic protection is required to protect steel pipeline from corrosion. The SCADA system provides remote monitoring capabilities.

Small volumes of liquid waste such as oils and grease may be generated during operation. Waste material will be disposed of in accordance with relevant regulatory requirements. Oils and grease are generally consumed slowly during normal operation, and therefore these quantities are very small.

All natural gas releases will be carried out in accordance with operating procedures. The impact of methane release may be mitigated through the use of flares while purging the pipeline.

Natural gas will be odourized for public and customer safety at the HPRS. Odourant is a blend of mercaptans which produce a very strong odour. These will be either vapourized or injected into the flow of natural gas.

Heritage Gas typically utilizes a vapourizer type odourizer. During the first year it is estimated that approximately 400 L of odourant will be introduced into the gas stream at this facility, which will require replenishment of supply not more than three times a year. Odourant is delivered in sealed tanks directly to the station site, and when the transfer of odourant from the tank to the odourizer is required, it is done in a completely sealed manner.

In some cases, temporary odourization will be provided downstream of the permanent odourization location for the initial operation of the proposed development, until pipeline walls are saturated with the odourant and the odourant level within the entire system has been stabilized at acceptable levels. Any temporary installations will be managed and monitored in the same manner as the permanent installation at the HPRS.

2.6.4 Telemetry

The system operations monitoring will be implemented using an automated SCADA (supervisory control and data acquisition) system. This system allows operations staff to remotely monitor pressure regulating stations, industrial customer metering stations and, in some cases, key valve stations. The SCADA system will incorporate communication, field instrumentation and alarms, and monitoring equipment to ensure for the safe operation of the gas distribution system. Facility components are designed to mechanically respond to changes in system conditions, and the SCADA system provides information to operations staff on how these components are operating.

2.6.5 Inspections of Pipelines and Facilities

An inspection program will be developed and implemented by Heritage Gas, based on specified standard procedures in Heritage Gas' Integrity Management programs. Inspections may be done using ATV's, aircraft surveillance, or walking of the pipeline. The inspection programs may include:

- leak surveys;
- in line inspections;
- aerial patrols;
- close interval cathodic protection surveys; and,
- valve inspections.

The pipeline locations will be marked with signs and post markings at public roads, railroad and water crossings and at separation distances along the easement so that signage is easily visible along the pipeline route. The signs will allow for rapid identification during inspection surveys.

Leak surveys will identify the location of any natural gas leak from the pipeline to enable repair. In line inspections will monitor the condition of the pipeline walls through the use of remote-controlled inspection devices. Aerial patrols may be used to identify unauthorized third party activities in the vicinity of the pipelines and detection of a leak by vegetation discolouration. Close interval cathodic protection surveys will monitor the performance of the cathodic protection system. Valve inspections will be completed on a routine basis to ensure valve operability.

2.6.6 Maintenance of Pipelines and Facilities

Standard procedures will dictate a schedule of maintenance on all components of the natural gas system. Maintenance will be required to ensure all facilities within the natural gas system are in good working order.

Maintenance may include:

- regulation and over-pressure protection inspections and overhauls;
- valve inspections and repairs;
- coating repairs;
- cathodic protection repairs and anode installation;
- pipeline repairs; and,
- above-ground facility building, piping and appurtenances maintenance.

In-stream work during operation would only occur as a result of a facility malfunction or pipeline rupture. The probability of occurrence is very low given the significant level of system monitoring and redundancy built into the design. In the unlikely event that in-stream work is required, it would be guided by the current requirements, procedures and guidelines to ensure environmental protection and would be completed in accordance with Heritage Gas' EPP and regulatory requirements in place at the time. This includes liaison with NSDNR, NSE, and DFO, as well as landowners and key stakeholders as appropriate. The work will meet current best practices associated with maintaining fish and fish habitat and water quality and protecting flora and fauna, especially species at risk or of concern.

2.6.7 Call Before You Dig Program

Heritage Gas has developed and operates a "Call Before You Dig" service in all regions of its system. This supports the requirement of Section 59 of the Pipeline Regulations (Nova Scotia), and Section 153 of the Occupational Safety General Regulations (Nova Scotia). This program will be extended to include the Pictou region. The toll free number will be widely publicized for the use of contractors and residents. Public education programs will deliver the message that prior to digging, residents or contractors must call the toll free number to request the location of the pipeline.

As part of this program, Heritage Gas provides field locates of underground natural gas pipelines free of charge. Locates will be completed by operations personnel, and are available on a 24/7 basis to provide locating services during emergency situations (e.g., water main breaks, power pole replacement).

2.6.8 Emergency Response

Heritage Gas operates a 24/7 emergency response system. A toll free number is publicized for the use of all Nova Scotia residents in case of a natural gas emergency. This system will be expanded to include the Pictou region. Operations personnel will respond to all emergencies involving the natural gas system. An Emergency Response Plan will be developed in consultation with local and provincial emergency response organizations to ensure rapid and effective response in the unlikely event of a serious incident.

Heritage Gas personnel work closely with local Emergency Response agencies during an emergency situation to provide assistance and guidance in responding to natural gas related incidents.

Upon notification of the possibility of a leak on a natural gas pipeline, operations personnel will be immediately dispatched to the site to identify the location of the leak. A leak investigation will be performed to pinpoint the location of the leak and identify required repair procedures.

Upon notification of a natural gas pipeline break, operations personnel will be dispatched to assess the damage, perform make-safe services, and to facilitate repair of the pipeline. When arriving on site, the operations personnel will isolate the natural gas source, if the line is damaged, to prevent further release of natural gas. This isolation may be accomplished using system valves or by squeezing the pipeline. The pipeline will be repaired and purged to restore natural gas supply.

Pressure regulating stations are equipped with over pressure protection systems. In some cases, these systems respond to an overpressure situation by releasing natural gas in a controlled manner. Such situations will be reported to operations personnel through the SCADA system, and responded to as emergencies. Heritage Gas personnel will be dispatched to the station site to identify and repair the problem at the station, and to discontinue the natural gas release.

2.7 Accidents and Malfunctions

While a low probability, there is a potential for accidents and malfunctions to occur during any phase of the Project. These are described below in terms of pre-construction, construction and decommissioning phases and the operational and maintenance phase of the Project.

During pre-construction, construction and decommissioning phases, it is expected that potential accidents and malfunctions would largely involve minor spills of hydraulic oil, fuel, lubricants and field-coating materials within the easement. These spills are normally readily contained and cleaned up following standard industry spill contingency measures and, when mitigated promptly, do not result in environmental effects. When spills occur close to or into a watercourse, there is potential for environmental effects on fish and fish habitat and water quality, both within the easement and downstream of the spill depending on the volume spilled.

To minimize the likelihood of a spill, Heritage Gas will implement environmental awareness training that will provide all staff with information on environmental protection measures to be employed on the project. This training will include handling and disposal of hazardous materials. As well, no fueling/maintenance zones (i.e. 50m) will be established around watercourses and other sensitive features to minimize potential of spills reaching watercourses. This is defined in the EPP and will be reiterated in the construction documents and specifications. In addition, contractors will be required to maintain appropriate spill response clean-up materials during construction. Procedures for prevention, contingency planning and response and reporting are also outlined in the EPP.

During HDD activities, there is a risk of release of drilling fluid. Signs of possible release include a reduction in drilling fluid pressure or reduced delivery rate of drilling fluids; these will be monitored by Contractor. As well, Heritage Gas will visually monitor watercourses for increased turbidity.

Risks in a HDD process that may lead to drilling fluid entering the watercourse or wetland include drilling fluid seeping subsurface through fractures in substrate, collapsed hole / washout of cavities, and seepage

of drilling fluid over land. The former two are considered a "frac out" as fluid enters watercourse subsurface while the third is overland.

The effect on watercourses and wetlands shall be limited by careful monitoring, access to appropriate equipment and materials, and well communicated response plans. An Environmental Contingency Plan will be prepared to include: materials on site; prevention and response; notification and reporting.

In addition to spills, there is a potential for fire associated with pipeline construction, either during the burning of slash or by an errant spark during construction. Uncontrolled fire will result in a loss of merchantable timber and may result in effects on environmentally sensitive areas outside the study area depending on conditions at the time and the extent propagation of the fire. Fire prevention and response is another key component Heritage Gas' environmental awareness. Appropriate firefighting equipment will be maintained by construction crews in high fire risk areas with particular attention to fire index.

During operations or decommissioning, accidents and malfunctions include potential for release of odourant. Odourant typically vapourizes rapidly when exposed to atmosphere, but under certain conditions may also remain present in liquid phase. The environmental impact may therefore be of two types, the release of odourant vapours and the spill of liquid odourant. Employees that are working in close proximity to the odourizing equipment must ensure that they are not exposed to high vapour concentrations or come in direct skin contact with the odourant.

Once vapourized and dispersed at low concentrations, odourant vapours are of no health and safety concerns to the public; however, public perception may be that a serious incident has occurred. This may lead to undue alarm and a large number of odour calls, since any release of odourant has the potential to be perceived directly by adjacent landowners within a wide radius, depending on dispersion patterns at the time of the incident.

In order to minimize potential releases, odourant will be purchased in sealed containers, typically within pressure vessels that will be filled at the manufacturer's plant. These pressure vessels are then transported to the site and connected to the odourizer to provide 'odourant-free' transfer. When empty, the pressure vessel is resealed and returned to the manufacturer. Odour masking agent or biological digesting agent is stored on site in order to enable releases to be brought quickly under control.

The risk of damage to the pipeline that has been installed with HDD is infinitesimal. Given the minimum required depth under a watercourse of 1.5m and the typical depth of 5m, scour is not an issue. However, should this extremely unlikely event occur, the length of pipe would be isolated, pulled out and re-drilled via HDD. All work would then occur as described elsewhere in this EA and in compliance with the Heritage Gas EPP and Project ECP.

Procedures to address prevention, contingency planning and response and reporting are outlined in the EPP (EP-09-6XXX Environmental Contingency and Emergency Response) and Emergency Response Manual as appropriate.

Leakage of pipeline or facilities, or damage through third-party hit or other causes may also result in short term unintentional releases. Regular O&M procedures, "Call Before You Dig" program, and emergency response plans of Heritage Gas as previously explained will minimize risk such events.

2.8 Decommissioning

The project life of a natural gas pipeline system may involve the decommissioning, closure or abandonment of facilities as redundancies develop or system requirements change. Facilities which are no longer required as part of the Heritage Gas system will be decommissioned or abandoned according to Pipeline Regulations (Nova Scotia) and the most current version of CSA Z662.

As removing underground pipe may result in environmental effects similar to those that occur during construction, below ground pipeline infrastructure will normally be abandoned in place. The pipeline will be purged of natural gas and physically separated from active pipeline facilities. The ends of the pipeline will be sealed and the pipeline filled with inert gas, such as nitrogen or air.

Above ground facilities, including valves, meters and regulating devices, will be removed upon decommissioning. Remaining underground portions of the facility will be capped and left buried as described above.

Salvageable material will be recycled or reused. Waste material such as welding rods and concrete will be disposed of in accordance with relevant regulatory requirements.

All purging will be carried out in accordance with established operating procedures. Methane release (i.e., a greenhouse gas) and noise levels will be mitigated through the use of flares to facilitate the purge of the pipeline.

2.9 Future Phases of the Project

As indicated in the introduction, Heritage Gas is prepared to expand its Pictou County pipeline system to the urban areas of New Glasgow, Stellarton and Trenton as soon as customer demand is evident in these areas. This potential for a future extension could occur as early as 2014; however, as yet no construction date has been fixed since no customer has formally requested natural gas service.

In addition to Michelin and Northern Pulp, approximately forty (40) potential commercial / industrial / institutional customers have been identified jointly by Heritage Gas and the PRDA, and form the basis of Heritage Gas' initial plans. Among these are the Aberdeen Regional Hospital, Sobey's (Head Office), Scotsburn Dairy, the NSCC Pictou Campus, the North Nova Education Centre, the Museum of Industry, and the Aberdeen Business Centre.

Natural gas is the cleanest burning of all fossil fuels with no SO2 emissions and the lowest NOx and CO2 emissions (45% less CO2 than coal, 30% less CO2 than fuel oil). Heritage Gas estimates that the total GHG emission reduction to be achieved by these initial 40 customers is estimated to be over 24,000 tonnes per year.

Additionally, within a distance of mm1 km of initial plan pipes, there are approximately 5,000 private dwellings and 800 commercial properties which have the potential to access natural gas service.

The April 5 Press Release outlines the benefits to all Pictou County customers, with the following quotes excerpted from it:

> "The chamber of commerce is truly excited and encouraged that natural gas will be coming to Pictou County," said Dave Freckelton, past-president, Pictou County Chamber of Commerce. "As we continue to plan for the economic future of this region, it is imperative we have energy sources that are cost effective and environmentally friendly. The announcement made today is a significant step in working towards an alternative for our members to consider."
>
> "The delivery of natural gas to Pictou County is good for business," said Pat Lee, CEO, Pictou County Health Authority. "Our business is health care and we are continually seeking efficiencies and ways to save money. Natural gas will give us substantial annual savings, money that can be redirected to patient care."

2.10 Other Development in Area

There are two large industrial activities in the local area, i.e., Michelin and Northern Pulp, on Abercrombie Point. As large users of Bunker C which is transported by road to the facilities, the conversion of these large-users as proposed for the Project will reduce direct emissions from combustion of natural gas as compared to Bunker C, as well as reduce traffic and associated emissions from tankers transporting fuel.

Forestry operations and agricultural land use occur in proximity to the Project. Other land uses include existing land disturbances, such as existing utility and transportation corridors. Heritage Gas is not aware of any significant corridors currently under development. Therefore, there are no third party developments expected to interact with the Project; however, possible cumulative effects are discussed in the EA where interactions may occur. This is discussed in Section 6 for each biophysical VEC and socio-economic aspect included in this EA.

Heritage Gas has been in contact with the following local agencies to determine that there are no other major undertakings being planned in the near future in proximity to the Project:

- NS Department of Economic & Rural Development & Tourism
- Pictou County Development Planning Commission (PCDPC)
- Pictou County Public Works Department

Table of Contents

List of Figures

List of Tables

3.0 SCOPE OF THE ASSESSMENT

3.1 Scope of the Project

The following Project components are included within the scope of the EA:

(1) The High Pressure Reducing Station ("HPRS"): owned and operated by Heritage Gas and located adjacent to and on the same site as the M&NP CTS. This facility contains natural gas pre-heating, metering, odourant addition, and pressure regulation to reduce natural gas pressure down to a MOP of 4965 kPa (720 psig).

(2) The welded steel pipeline: Designed to have a MOP of 4965 kPa (720 psig) to convey natural gas from the HPRS to the PRSs located at the large industrial customers near Abercrombie Point. This pipeline consists of the following:
   a. From the M&NP CTS to Mount William Road: approximately 11.2 km of 219.1 mm diameter;
   b. From Mount William Road to Northern Pulp: approximately 7.8 km of 168.3 mm diameter; and
   c. Pipeline to Michelin: approximately 1.5 km of 114.3 mm diameter.

(3) Pressure Reduction Stations ("PRS"): required at each of the large industrial customers – owned and operated by Heritage Gas. These facilities are site specific and may contains natural gas pre-heating, metering (to measure usage), pressure regulation equipment to reduce natural gas pressure down to a level usable by the customer (typically in the range of 275 to 415 kPa, i.e. 40 to 60 psig for large industrial customers).

The following Project components are excluded from the scope of the EA:

(1) Custody Transfer Station: owned and operated by M&NP – includes tap into the M&NP transmission pipeline, and provides natural gas filtering and metering. This facility is under the National Energy Board jurisdiction and is outside the scope of this EA.

(2) Preparatory work undertaken by Heritage Gas prior to the decision of the Minister to designate the Project as a Class 1 undertaking under the Environmental Assessment Regulations (June 17, 2013): This preparatory work includes:
   a. Geotechnical program (boreholes and test pits) required for collecting geotechnical and bedrock conditions as part of Project planning phase. This work required the installation of some culverts and roads to provide access to the specific site(s);
   b. Land and access improvements as part of private easement negotiations;
   c. Delineation and probing of wetlands as part of data collection during the Project planning phase;
   d. Flagging of cutting limits in approximately 90 percent of areas requiring clearing;
   e. Staking out of pipeline alignment on Northern Pulp property; and
   f. Preparation of a pipe yard to house the pipe materials delivered to site in during May and June, 2013.

(3) Potential future expansion to clusters of customers: Should in the future, a natural gas customer or cluster of customers request service off the HP steel pipeline, and if such request can be satisfied safely and economically, Heritage Gas is prepared to make natural gas accessible off the HP steel pipeline. Such service would require pressure regulation and polyethylene (PE) distribution at pressure below 690 kPa (100 psig), and as such would not require an EA.

(4) Potential future expansion to the urban areas of Pictou County: This work will be reviewed and evaluated by the Minister at a later date in the event that Heritage Gas decides to proceed with this extension.

(5) Customer conversion to natural gas: Activities to convert fuel burning equipment to natural gas and its subsequent use by potential customers are outside the scope of this EA.

3.2 Scoping and Project Boundaries

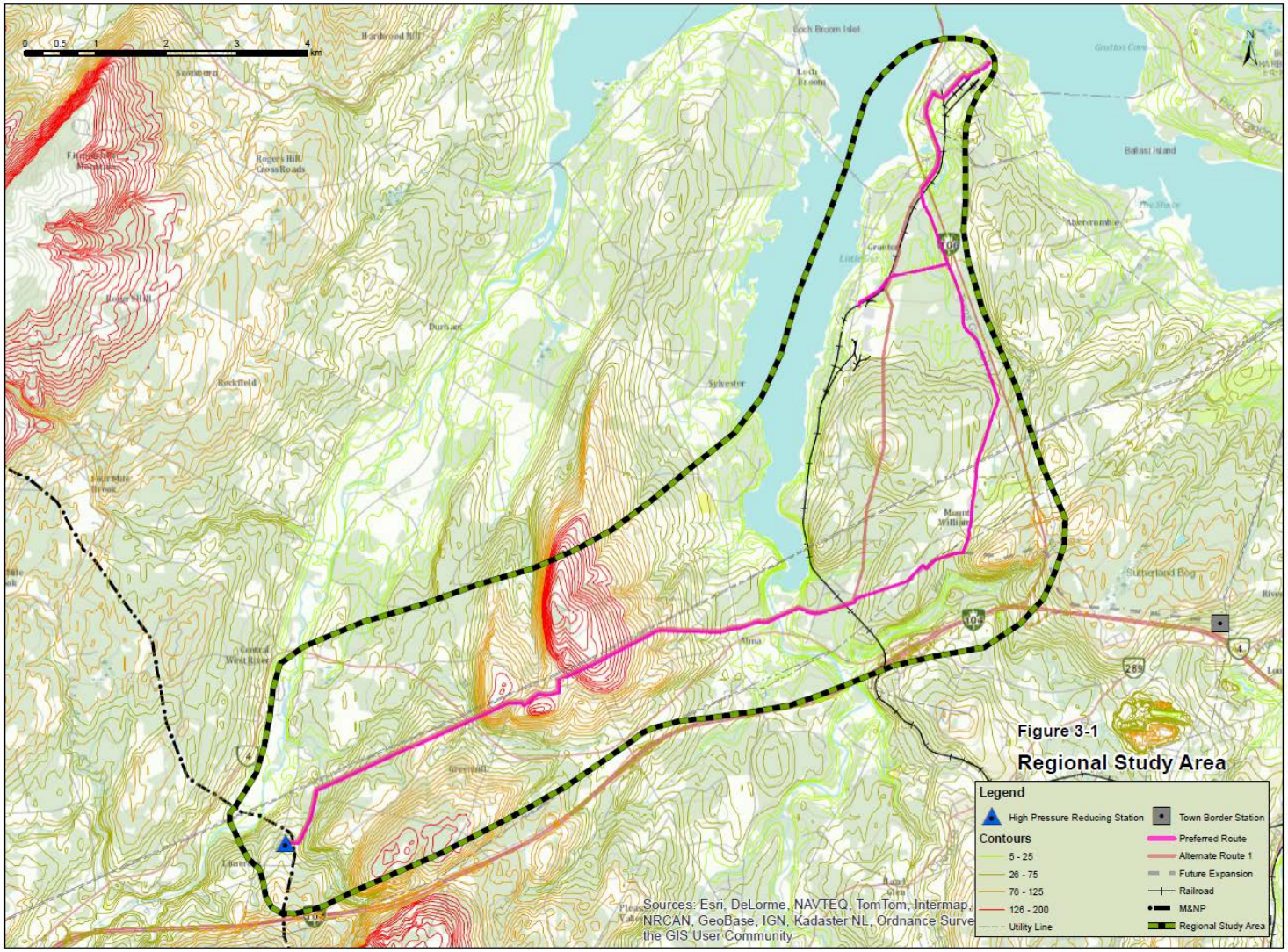
The study area itself includes a spatial bound which is the footprint of the works associated with the construction and operation of the proposed Project and those areas within which most "Project – environment" interactions could reasonably be expected to occur.

The regional study area is shown on Figure 3-1. This broader area encompassed potential routing options (i.e., red, blue, green and magenta routes as shown on Figure 2-3) and was delineated roughly to the east of Highway 106, to the west of West River and to the south of Highway 104. This regional study area includes the proposed connection to the existing M&NP pipeline and Abercrombie Point. The preferred route for the Project (i.e., magenta alignment) and above-ground facilities are within this regional study area.

The Project footprint includes the right-of-way ("RoW") to construct the pipeline, ancillary features i.e. access roads and HDD set up areas, and the sites for above ground facilities i.e. one HPRS and two PRSs. Heritage Gas has provided NSE and NSDNR with the digital Project footprint delineation.

Spatial boundaries are identified for each VEC or socio-economic aspect as an integral part of the analysis in Section 6.0.

Figure 3-1 Regional Study Area



Temporal Project boundaries include the timeline for the short term construction activities, as well as the long term operation of the pipeline and above-ground facilities of approximately fifty years plus and its eventual decommissioning. Temporal boundaries are identified for each VEC and socio-economic aspect as an integral part of the analysis in Section 6.0.

The scoping process identifies those biophysical VECs or socio-economic aspects that are valued and that may be subject to impact given the works proposed as described in Section 2.0. These works include the construction and operation / maintenance phases, including accidents and malfunctions, and decommissioning. The identification of VECs and socio-economic aspects is based upon the potential interaction of the Project within the biophysical and socio-economic setting as described in Section 4.0. In addition, any stakeholder concerns identified in consultation as described in Section 5.0 are heavily weighted when identifying VECs and socio-economic aspects to be assessed.

The potential interaction of Project activities with the VECs and socio-economic aspects forms the scope of the assessment. Indeed this scoping was completed at a preliminary level to define the primary and secondary studies completed for the Project. Environmental assessment is an iterative process. The scoping is continually refined as the project is further developed, the environmental setting is studied and consultation is held. As it is impractical, to assess all potential effects of a project, the scoping land boundaries of the assessment is key.

The study team has determined the biophysical VECs and socio-economic aspects that will be subject to assessment based upon its collective knowledge and experience, review of the regulatory requirements, and feedback from the community, First Nations, regulatory authorities and others as part of the consultation program and selected field programs. Based on this process, there are a total of thirteen VECs and socio-economic aspects that are evaluated for the Project; these are identified in Table 3-1.

Table 3-1 Identified VECs and Socio-economic Aspects

Physical Components	***Ecological Components***	***Socio-economic Aspects***
Ground and surface waters	Wetlands and watercourses	Land use
Ambient noise and light	Fish and fish habitat	Archaeological resources
Air quality	Migratory and breeding birds	Aboriginal resources / uses
	Flora and fauna	Health and safety
	Species at risk and of concern	Economic development

An important factor in the assessment process is the determination of spatial and temporal boundaries, i.e., the time period and spatial area within which each VEC or socio-economic aspect is likely to interact with, or be influenced by, the Project. Temporal boundaries encompass the times that Project activities, and their effects, overlap with the presence of each VEC or socio-economic aspect. Spatial boundaries are the areas within which the Project activities are undertaken and the facilities are located, and the zone of influence of effects of the Project, i.e., direct Project footprint or indirect via emissions or discharges. The boundary for each VEC and socio-economic aspect are presented in Section 6.0 as part of the analysis.

3.3 Desktop and Field Work Completed

Ecological, social and geophysical desktop data was compiled and analysed with the intent to design targeted field investigations at the Project site. Data was compiled from the following sources:

- Nova Scotia Department of Natural Resources (NSDNR);
- Service Nova Scotia and Municipal Relations (SNSMR);
- Atlantic Canada Conservation Data Center (ACCDC);
- Nova Scotia Communities Culture and Heritage (CCH);
- Species at Risk Act (SARA);
- Committee on the Status of Endangered Wildlife in Canada (COSEWIC) listings;
- Maritime Breeding Bird Atlas (MBBA);
- NSDNR General Status Ranks of Wild Species; and
- Geobase, a database of Canadian GIS information.

Field programs commenced in October 2012 and concluded in June 2013. General field reconnaissance occurred in late 2012. Consultants were familiar with documented protocols related to the completion of an EA Registration document in Nova Scotia, including NSE's Guide to Addressing Wildlife Species and Habitat in an EA Registration Document (November 2005, Rev. September 2009). The lead field program consultants are named in Table 3.2. Field programs were completed within the regional study area with focus on the two preferred alignments (i.e., red and magenta routes) in 2012 and on the Project footprint in 2013.

Table 3-2 Field Program Consultants

Field Study	Field Program	Consultant
Rare Plant Survey	Preliminary survey (Fall 2012) and early season rare plant survey (June 2013)	Dillon Consulting Tom Neily
Wetland Identification	Wetland surveys (April 2013 and June 2013)	Dillon Consulting Tom Neily, Penny Allen,
Watercourses and Fish Habitat	Identification, select baseline water quality and visual assessment (fall 2012 and June 2013)	Dillon Consulting Karen March & Paul Koke, Tom Neily, & Kristine Cavanagh
Archaeology Investigation	Archaeology Screening and Reconnaissance; Archaeological Shovel Testing (June 2013)	CRM Group Bruce Stewart & Robert Shears
Bird Surveys	Early summer nesting field survey	Ken McKenna, independent consultant

In addition to the above, a supplementary field program will be conducted on late season rare plants in August 2013. That survey will confirm rare plant habitat prior to construction and enable the development of additional mitigation measures, should any be required.

The specific methodology and outcome of these field studies as well as supporting desktop review and field reconnaissance are presented in Section 4.0.

3.4 Methodology of Assessment

The assessment focuses on evaluation of predicted environmental effects resulting from potential interactions between the biophysical VECs and socio-economic aspects and the Project activities (construction, operation and maintenance, and decommissioning).

An "environmental effect" is defined in Nova Scotia's Environment Act as:

(i) *any change, whether negative or positive, that the undertaking may cause in the environment, including any effect on socio-economic conditions, on environmental health, physical and cultural heritage or on any structure, site or thing including those of historical, archaeological, paleontological or architectural significance, and*

(ii) *any change to the undertaking that may be caused by the environment*.

To enable the Province to make a subsequent decision on a project, the assessment needs to determine the significance of any residual adverse environmental effects. Residual environmental effects are those that remain after mitigation strategies are implemented. The prediction of residual environmental effects requires the determination that: the environmental effect is adverse; the adverse environmental effect is significant; and the significant adverse environmental effect is likely to occur.

Evaluation of environmental effects in this assessment uses the following definitions which consider the nature, magnitude, reversibility, duration and aerial extent of the effect:

- Significant: Potential effect could threaten sustainability of the resource in the study area and should be considered a management concern;
- Minor: Potential effect may result in a small decline of the quality of the resource in the study area during the life of the project, as such, research, monitoring and/or recovery initiatives should be considered;
- Negligible: Potential effect may result in a very slight decline of the quality of the resource in the study area during the life of the project, as such, research, monitoring and/or recovery initiatives would not normally be required; and
- Beneficial: Potential effect is expected to enhance the specific VEC or socio-economic aspect.

Where there is no predicted interaction of the Project and the biophysical VEC and socio-economic aspect prior to mitigative and control measures, there is no predicted effect and accordingly, it is not assessed. This is shown in Table 6-1.

To set the Project into its broader ecological and regional development context, the assessment considers how the proposed Project may interact with past, present or likely (i.e., approved) future projects within the spatial and temporal bounds identified. This evaluation of cumulative effects is completed for each VEC and socio-economic aspect in the assessment. Other developments in the area, including potential pipeline extensions, are discussed in Section 2.0 to scope the cumulative effects assessment. Further, a review of the effect of the environment on the Project is completed. This includes climatic fluctuations and extreme events, such as fire and spills. Residual environmental effects are summarized in Table 6-2.

Table of Contents

List of Figures

List of Tables

4.0 ENVIRONMENTAL SETTING

This section provides the environmental setting focusing on key Valued Environmental Components ("VEC"s) for the impact assessment in **Section 6**. The general study area was identified in **Section 3**, but VEC specific considerations are incorporated in the description below. Information in this section is provided primarily based on background data sources as noted. Where field surveys were conducted, the methodology and findings are summarized.

4.1 Biophysical

The proposed pipeline route falls predominately within the Northumberland Lowland Ecodistrict (NSDNR 2003). This area which borders on the Northumberland Strait is characterized by low elevation, typically less than 50 m above sea level (asl). The ecodistrict has a good growing climate. It is sheltered from storms from the south and east contributing to significant moisture deficit with mean annual precipitation of 1128 mm. Red sandstone bedrock and derived imperfectly drained soils predominate. Natural forest cover is dominated by coniferous (softwood) tree species, black and red spruce. Areas with disturbance are invaded by early successional species – balsam fir, red maple, white birch, trembling aspen and large-tooth aspen. Abandoned farmland may support tamarack or alders replaced by white spruce. Better drained areas support shade tolerant hardwoods but are uncommon.

A small portion of the route in the Salem Hill area is within an area defined by Nova Scotia Department of Natural Resources ("NSDNR") as the Cobequid Highlands Ecodistrict. This ecodistrict is also dry, but has a higher percentage of tolerant hardwood areas. Between elevated hills, imperfectly drained flats support red and black spruce forests where not disturbed.

General Habitats Present

The proposed pipeline is primarily adjacent existing disturbed corridors; powerlines, roadways and railways. The corridor travels through small areas of hardwood forest, softwood forest and more extensive agriculture and forest harvest areas. Wetlands, watercourses and associated riparian areas occur sporadically. Residential development occurs adjacent to the study area.

Generalized habitats within the study corridor are identified on **Figure 4-1** based on NSDNR cover types and include:

Softwood forests – These areas are generally dominated by red/ black spruce and balsam fir with minor amounts of red maple. Poorly drained and treed wetland areas support black spruce and tamarack. Ground cover includes a variety of shrub species (where more open areas occur) and bunchberry and sphagnum (in forested areas).

Mixed wood forests – Mixed woods occur throughout the area with tree species including red/black spruce, red maple, aspen and balsam fir. The majority of the mixed wood area is regeneration from historic forest harvest. Shrub species such as false mountain holly, and lambkill are present. Wild sarsaparilla and ferns are also prevalent throughout the habitat.

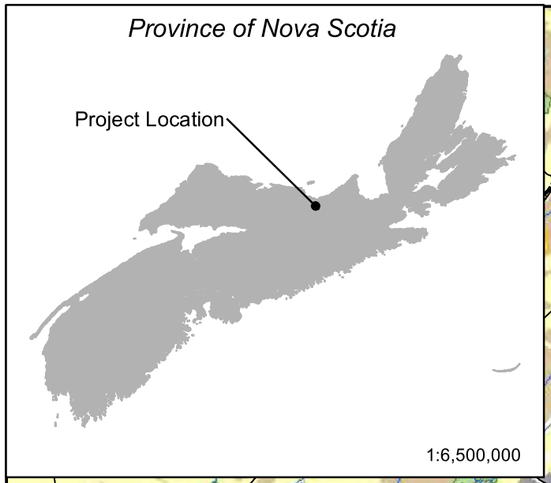


Figure 4-1

Ecological Setting

Pictou County Natural Gas Pipeline

Legend

- Road
- Collector
- Expressway / Highway
- Preferred Route and Michelin Connector
- Maritime and Northeast Pipeline
- Railroad
- Utility
- Watercourses
- Waterbody
- NSDNR Wetlands
- Delineated Wetlands

General Land Use

- Forested (Other)
- Urban
- Disturbed
- Other

Significant Wildlife Habitats

- Deer Wintering Habitat
- Migratory Bird Habitat
- Other Habitat*
- Species at Risk Habitat

* Significant Habitats (NSDNR)

Forest Cover Type

- Hardwood Dominant
- Softwood Dominant
- Mixed Forest Cover

Site ID	Common Name
PI140	Wood Turtle
PI185	Greater Scaup
PI191	Bald Eagle
PI193	Bald Eagle
PI194	Bald Eagle
PI197	Bald Eagle
PI204	Bald Eagle

Heritage Gas

DILLON CONSULTING

0 0.5 1 2 km

SCALE 1:50,000 STATUS: DRAFT DATE: 06/27/13

Data Sources: NSDNR, GeoNova, Heritage Gas, NRC, 2012-2013 field surveys

Projection: NAD_1983_CSRS_UTM_Zone_20N