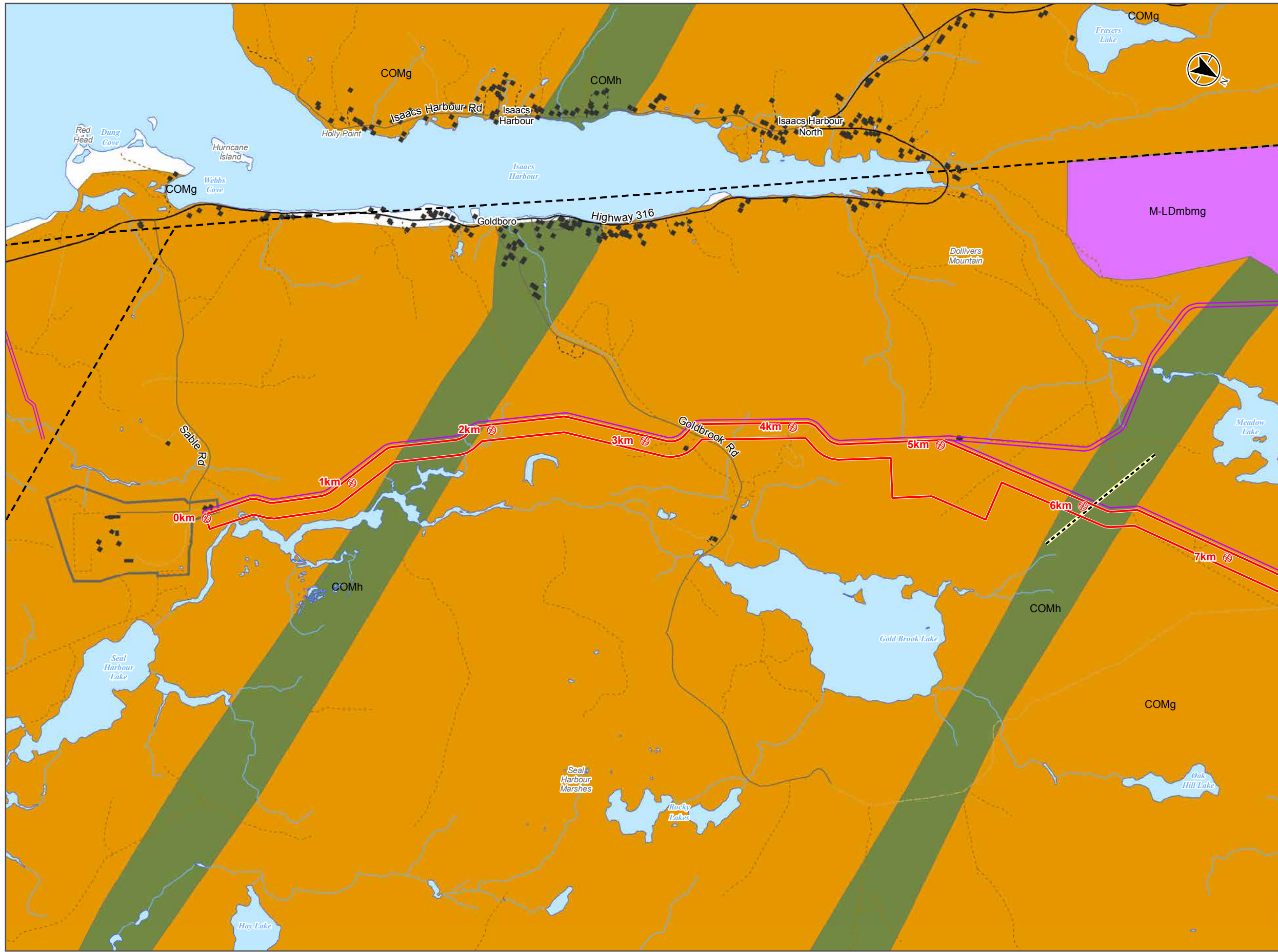


March 2016

APPENDIX D GROUNDWATER RESOURCES MAPBOOK



March 2016



Bedrock Geology in the Vicinity of the Assessment Corridor

Study Features

- ↑↑↑ Anticline
- ↓↓↓ Syncline
- - - Fault

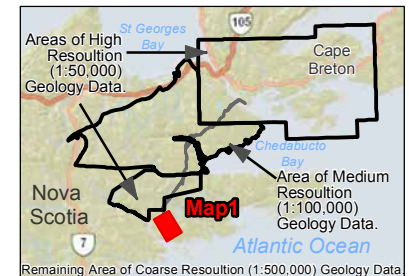
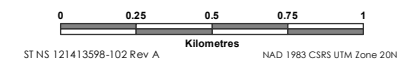
Bedrock Geology (1:500,000)

- Liscomb Complex, Middle - Late Devonian muscovite biotite monzogranite (M-LDmbmg)
- Meguma Group, Halifax Formation (COMh)
- Meguma Group- Goldenville Formation (COMg)

Project Components

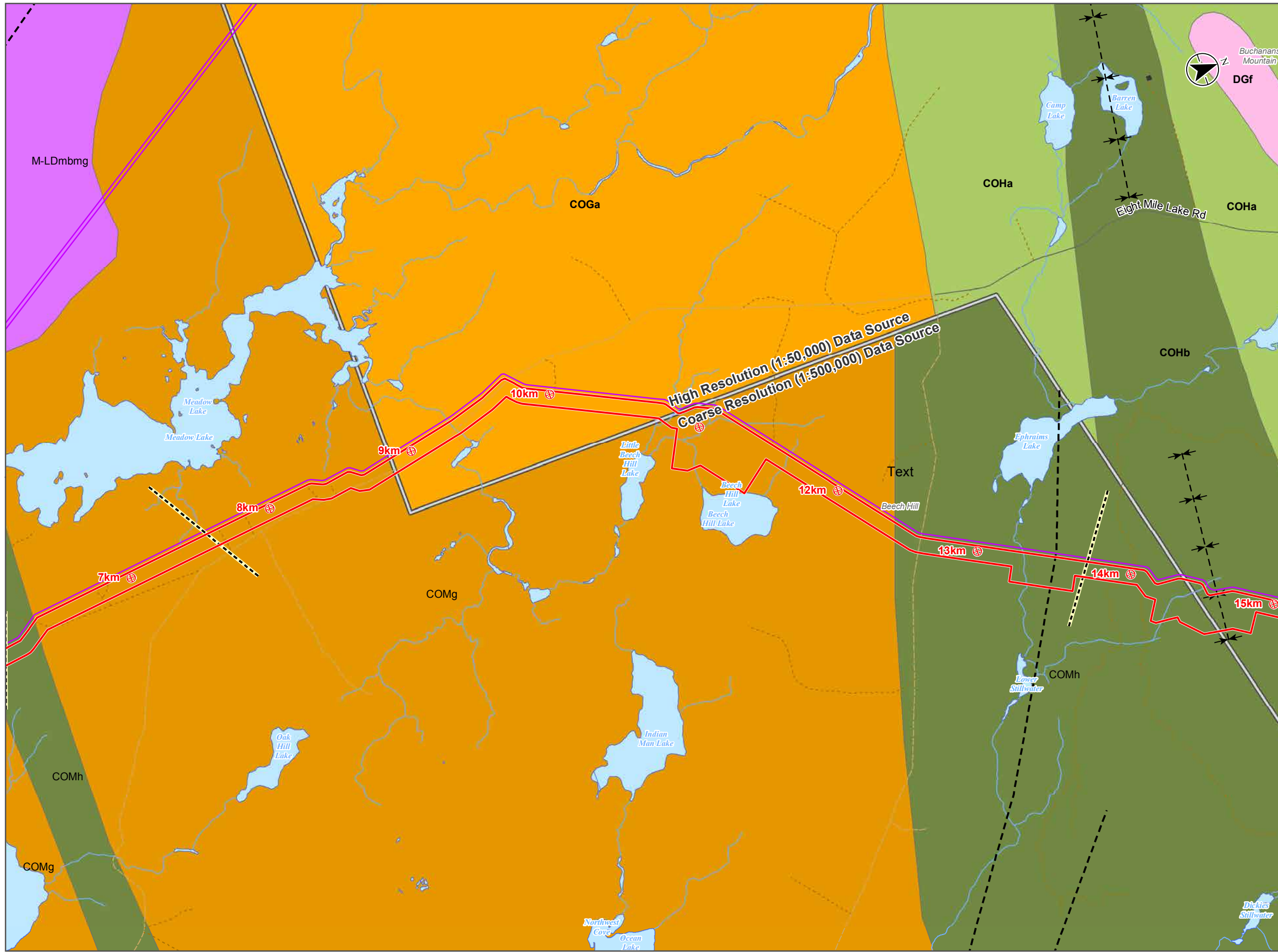
- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor
- Existing Pipeline Right of Way
- Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Bedrock Geology data provided by the Government of Nova Scotia.



Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.





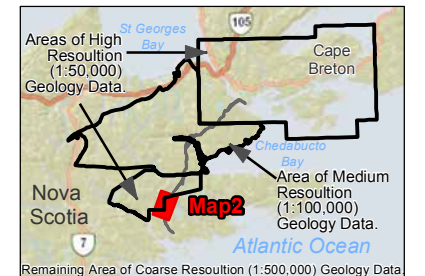
Bedrock Geology in the Vicinity of the Assessment Corridor

- Study Features**
- ↕↕↕ Anticline
 - ↔↔↔ Syncline
 - - - Fault
- Bedrock Geology (1:50,000)**
- Upper Devonian leucogranite (DGf)
 - Meguma Group, Halifax Formation mica-quartz-garnet phyllite (COHb)
 - Meguma Group, Halifax Formation graphite schist (COHa)
 - Meguma Group, Goldenville Formation thickly bedded (COGa)
- Bedrock Geology (1:500,000)**
- Liscomb Complex, Middle - Late Devonian muscovite biotite monzogranite (M-LDmbmg)
 - Meguma Group, Halifax Formation (COMh)
 - Meguma Group- Goldenville Formation (COMg)
- Project Components**
- ⊕ Kilometre Post (Approximate Distance from Origin)
 - ▭ Assessment Corridor
 - ▭ Existing Pipeline Right of Way
 - - - Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Bedrock Geology data provided by the Government of Nova Scotia.

0 0.25 0.5 0.75 1
Kilometres

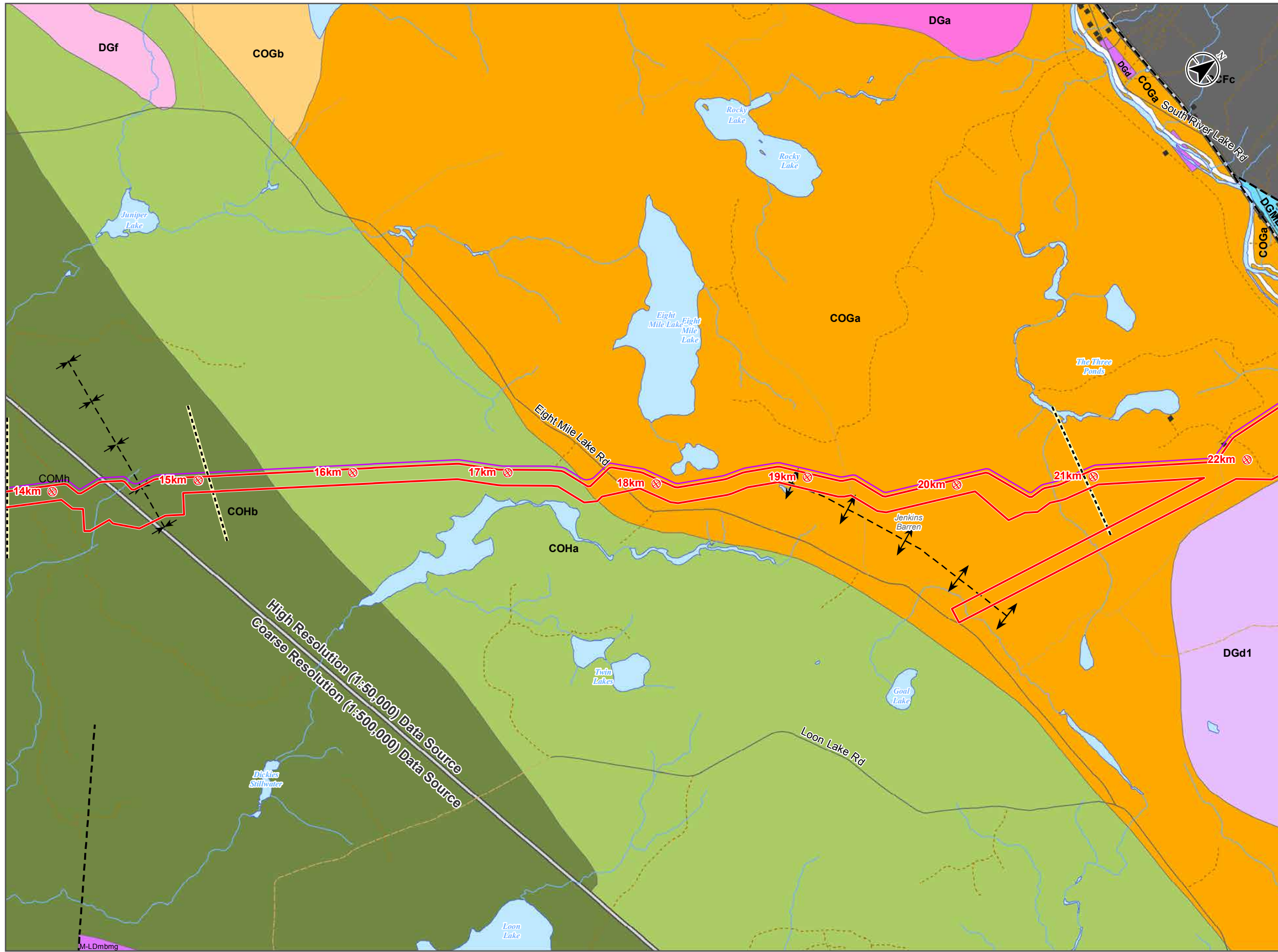
ST NS 121413598-102 Rev A NAD 1983 CSRS UTM Zone 20N



Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

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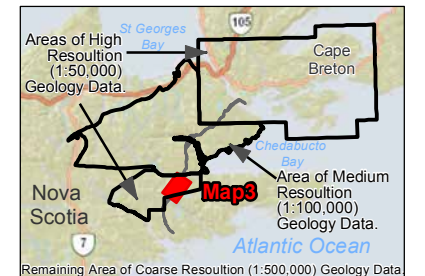
Bedrock Geology in the Vicinity of the Assessment Corridor

- Study Features**
- ↕↕↕ Anticline
 - ↔↔↔ Syncline
 - - - Fault
 - - - Fault
- Bedrock Geology (1:50,000)**
- Upper Devonian leucogranite (DGf)
 - Upper Devonian med grained equigranular to slightly porphyritic granite (DGd)
 - Upper Devonian med grained equigranular to slightly porphyritic granite less than biotite (DGd1)
 - Upper Devonian equigranular leucogranite (DGa)
 - Meguma Group, Halifax Formation mica-quartz-garnet phyllite (COHb)
 - Meguma Group, Halifax Formation graphite schist (COHa)
 - Meguma Group, Goldenville Formation thickly bedded (COGa)
 - Meguma Group, Goldenville Formation thinly bedded (COGb)
- Bedrock Geology (1:100,000)**
- Guysborough Group, Minister Brook Formation (DGMB)
 - Chedabucto Fault Complex (DCFc)
- Bedrock Geology (1:500,000)**
- Liscomb Complex, Middle - Late Devonian muscovite biotite monzogranite (M-LDmbmg)
 - Meguma Group, Halifax Formation (COMh)
- Project Components**
- ⊕ Kilometre Post (Approximate Distance from Origin)
 - ▭ Assessment Corridor
 - ▭ Existing Pipeline Right of Way
 - - - Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Bedrock Geology data provided by the Government of Nova Scotia.

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Kilometres

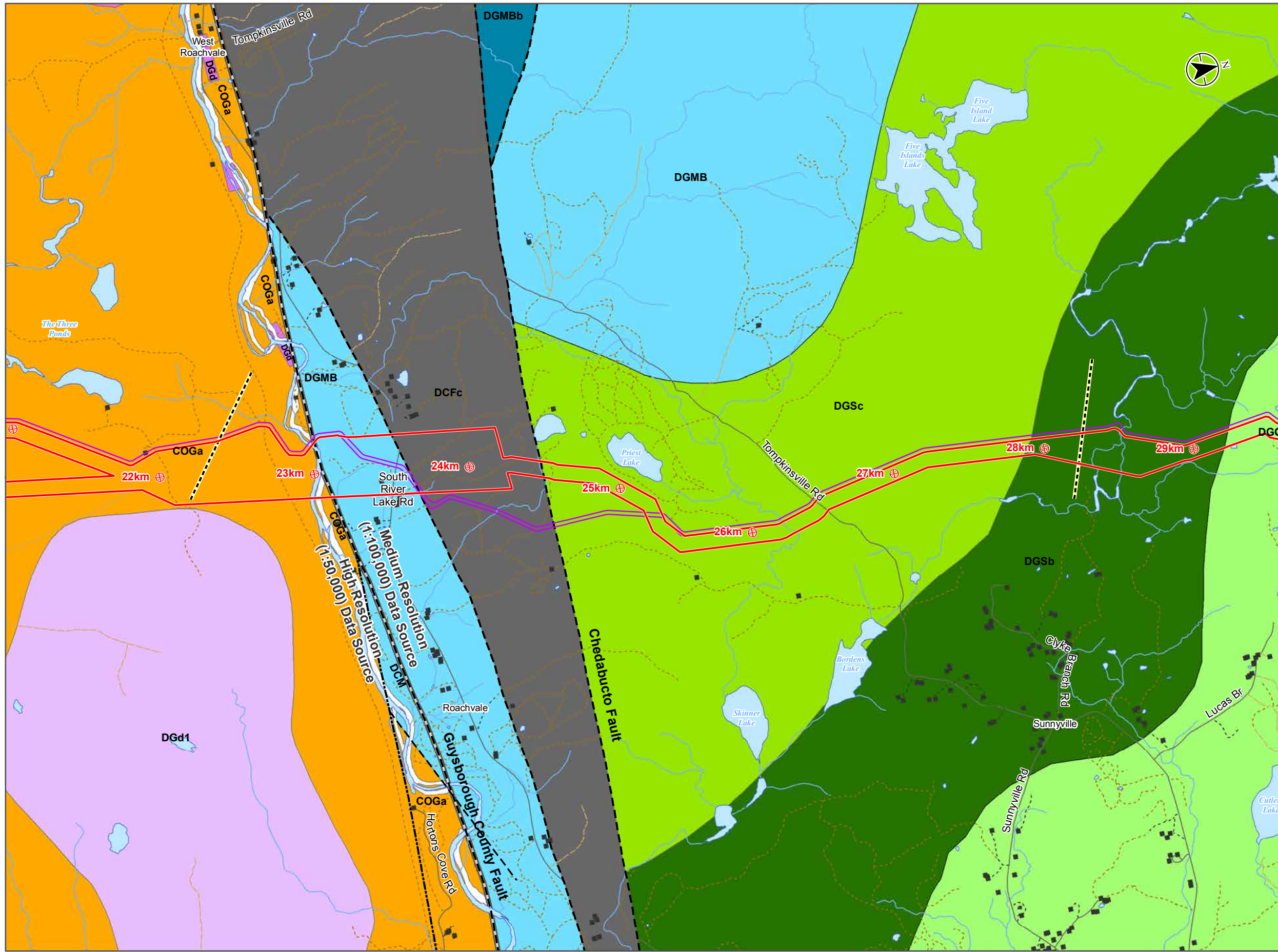
ST NS 121413598-102 Rev A NAD 1983 CSRS UTM Zone 20N



Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

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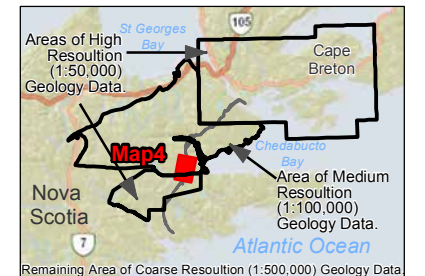
Bedrock Geology in the Vicinity of the Assessment Corridor

- Study Features**
- ⬆⬆⬆ Anticline
 - ⬆⬆⬆ Syncline
 - Fault defined
 - - - Fault assumed
 - - - Fault
- Bedrock Geology (1:50,000)**
- Guysborough Group, Minister Brook Formation (DCM)
 - Upper Devonian med grained equigranular to slightly porphyritic granite (DGd)
 - Upper Devonian med grained equigranular to slightly porphyritic granite less than biotite (DGd1)
 - Upper Devonian equigranular leucogranite (DGA)
 - Meguma Group, Goldenville Formation thickly bedded (COGa)
- Bedrock Geology (1:100,000)**
- Guysborough Group, Glenkeen Formation (DGG)
 - Guysborough Group, Sunnyville Formation (DGSb)
 - Guysborough Group, Sunnyville Formation (DGSa)
 - Guysborough Group, Minister Brook Formation (DGMB)
 - Guysborough Group, Minister Brook Formation (DGMBb)
 - Chedabucto Fault Complex (DCFc)
- Project Components**
- ⊕ Kilometre Post (Approximate Distance from Origin)
 - ▭ Assessment Corridor
 - ▭ Existing Pipeline Right of Way
 - Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Bedrock Geology data provided by the Government of Nova Scotia.

0 0.25 0.5 0.75 1
Kilometres

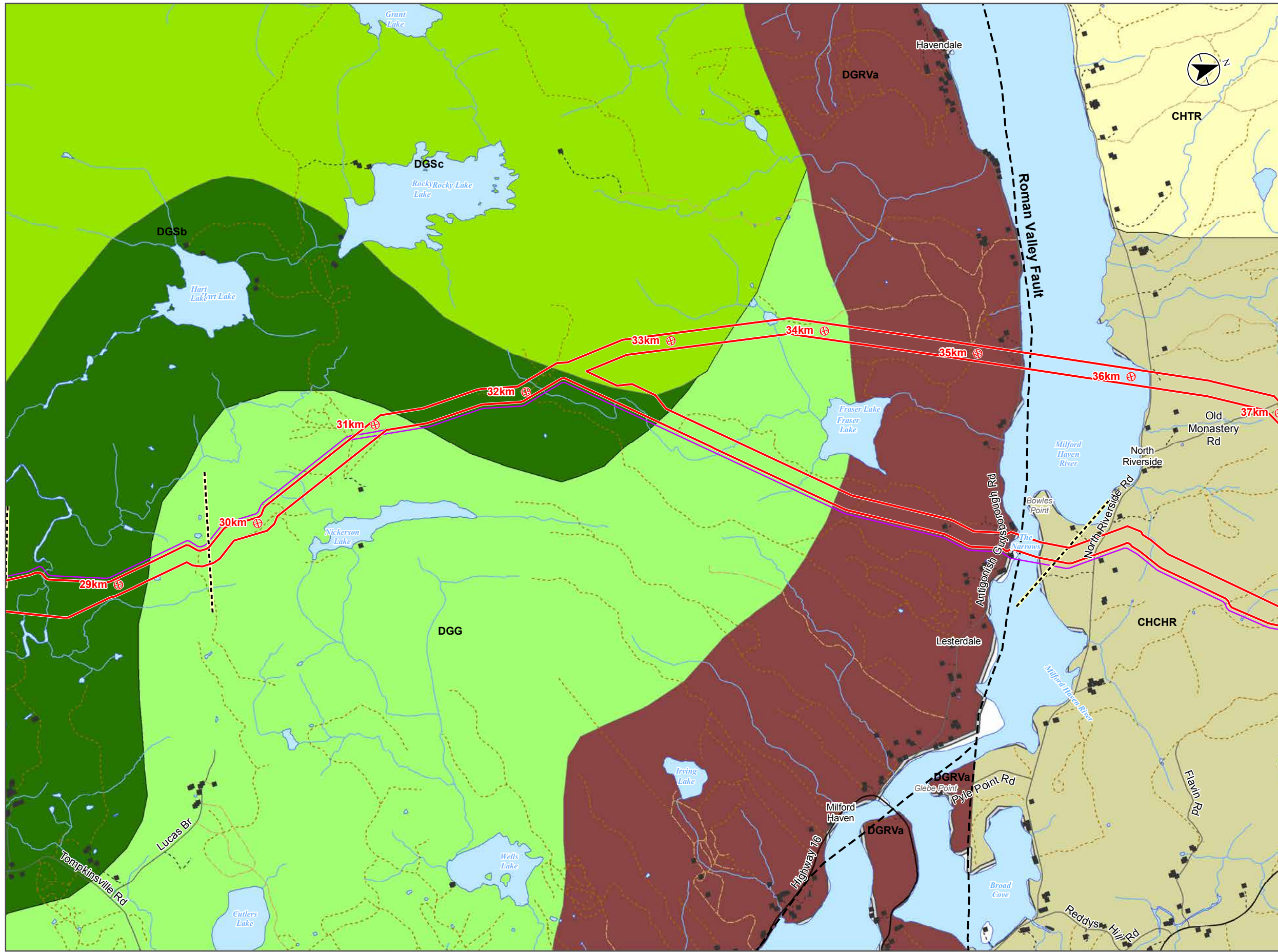
ST NS 121413598-102 Rev A NAD 1983 CSRS UTM Zone 20N



Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

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Bedrock Geology in the Vicinity of the Assessment Corridor

Study Features

- ⬆⬆⬆ Anticline
- ⬆⬆⬆ Syncline
- - - Fault

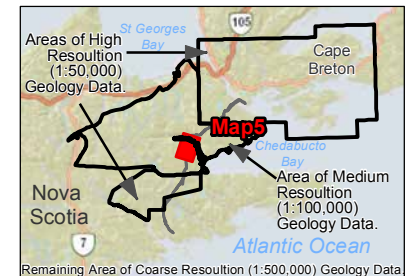
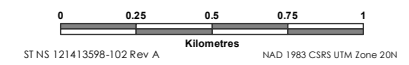
Bedrock Geology (1:100,000)

- Horton Group, Tracadie Road Formation (CHTR)
- Horton Group, Clam Harbour River Formation (CHCHR)
- Guysborough Group, Roman Valley Formation (DGRVa)
- Guysborough Group, Glenkeen Formation (DGG)
- Guysborough Group, Sunnyville Formation (DGSb)
- Guysborough Group, Sunnyville Formation (DGSc)

Project Components

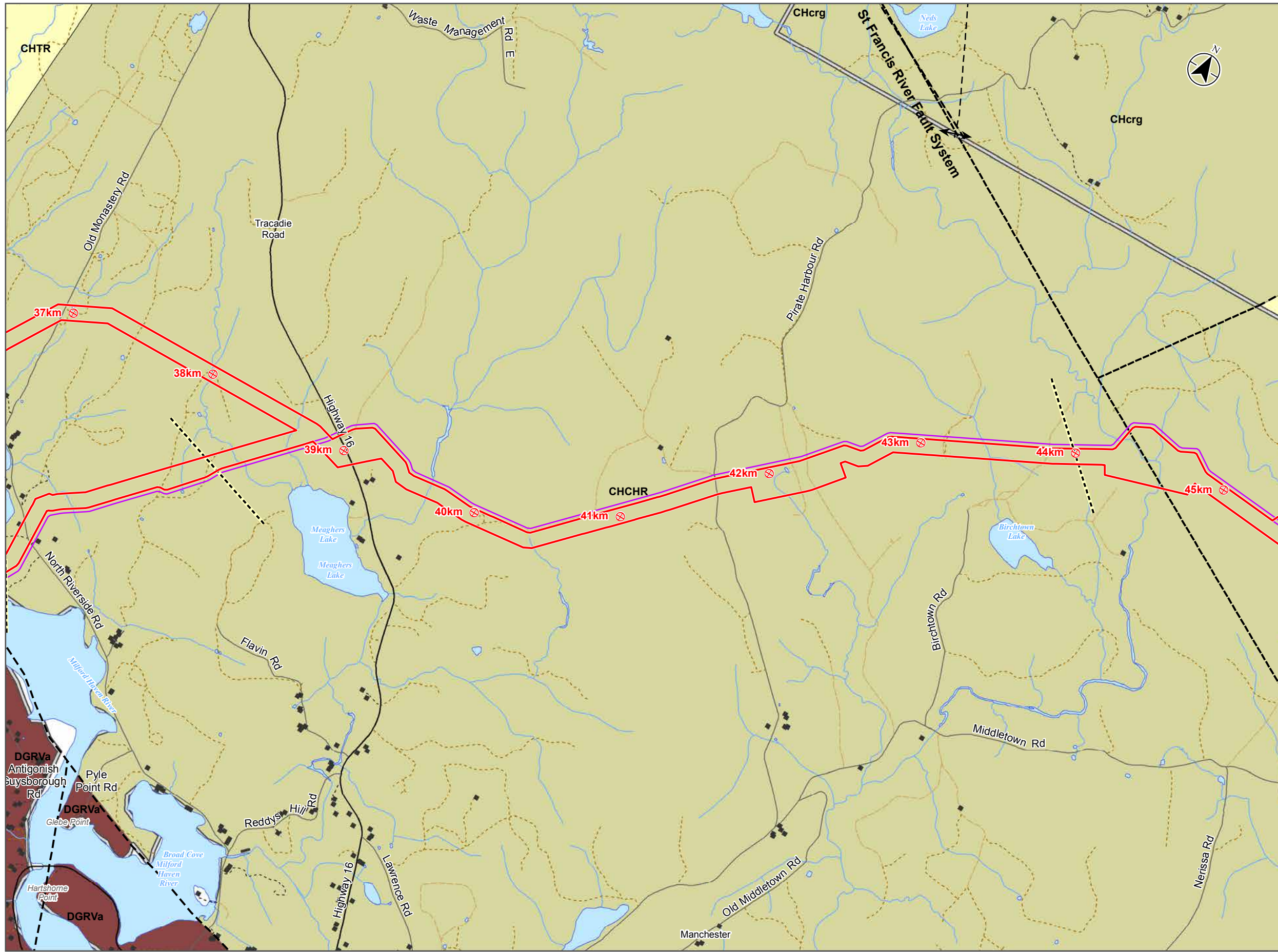
- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor
- Existing Pipeline Right of Way
- Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Bedrock Geology data provided by the Government of Nova Scotia.



Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.





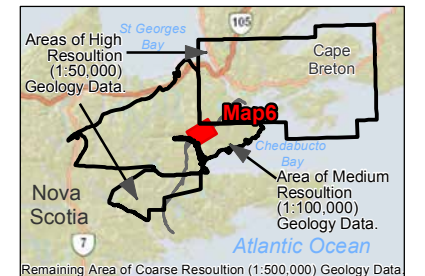
Bedrock Geology in the Vicinity of the Assessment Corridor

- Study Features**
- ↑↑↑ Anticline
 - ↓↓↓ Syncline
 - - - Fault - approximate
 - - - Fault
- Bedrock Geology (1:50,000)**
- Light yellow: Horton Group, Tracadie Road Formation, Halfmoon Lake Member (CHtrh)
 - Light green: Horton Group, Clam Harbour River Formation, Goose Harbour Lake Member (CHcrg)
- Bedrock Geology (1:100,000)**
- Light yellow: Horton Group, Tracadie Road Formation (CHTR)
 - Light green: Horton Group, Clam Harbour River Formation (CHCHR)
 - Dark green: Guysborough Group, Roman Valley Formation (DGRVa)
- Project Components**
- ⊕ Kilometre Post (Approximate Distance from Origin)
 - Red outline: Assessment Corridor
 - Purple outline: Existing Pipeline Right of Way
 - - - Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Bedrock Geology data provided by the Government of Nova Scotia.

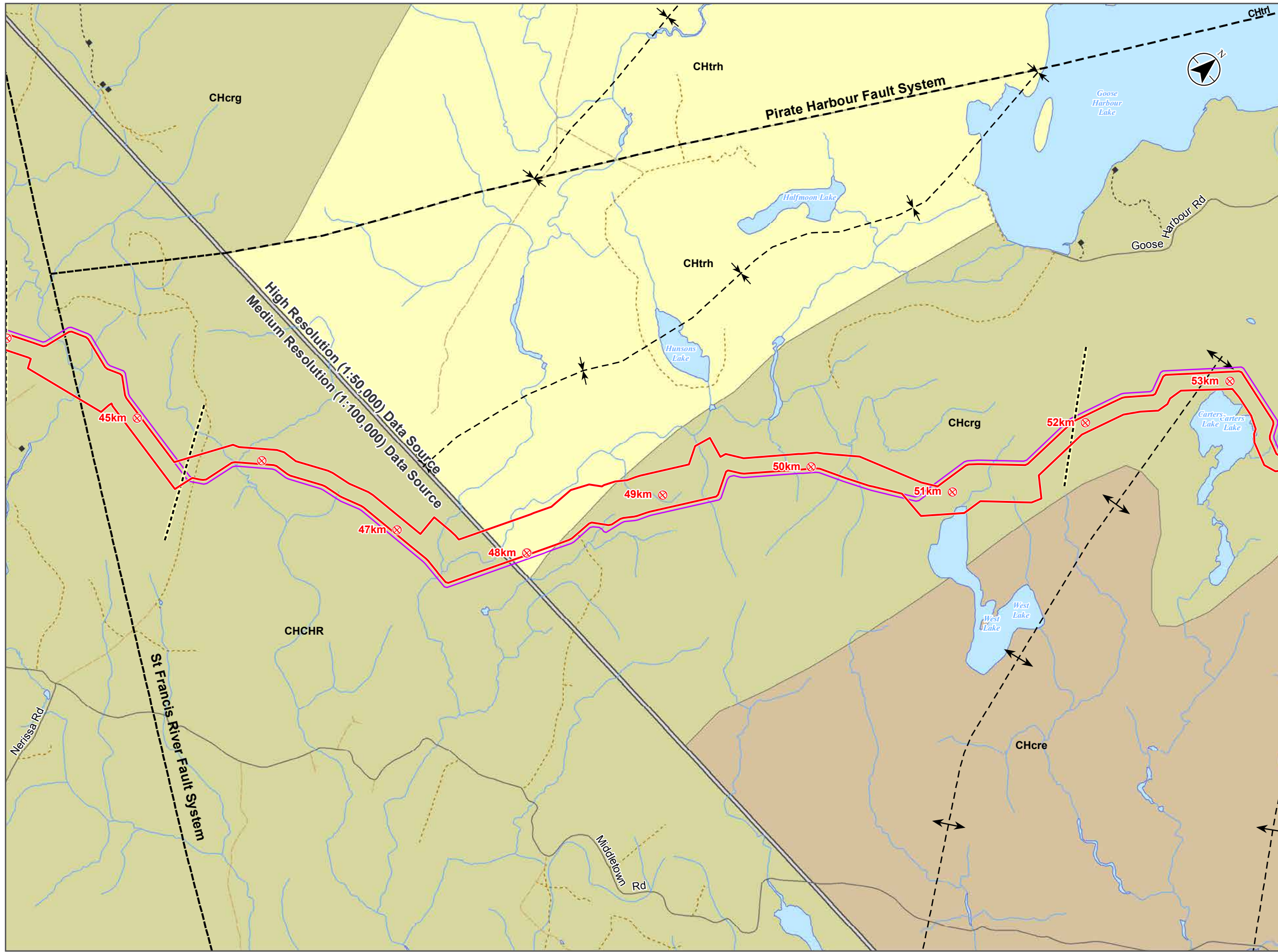
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Kilometres

ST NS 121413598-102 Rev A NAD 1983 CSRS UTM Zone 20N



Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.





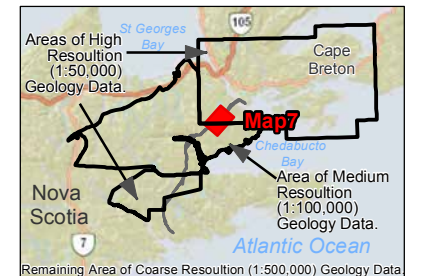
Bedrock Geology in the Vicinity of the Assessment Corridor

- Study Features**
- ↕↕↕ Anticline
 - ↕↕↕ Syncline
 - - - Fault - approximate
- Bedrock Geology (1:50,000)**
- Light yellow box: Horton Group, Tracadie Road Formation, Lincolnville Member (CHtrl)
 - Yellow box: Horton Group, Tracadie Road Formation, Halfmoon Lake Member (CHtrh)
 - Light green box: Horton Group, Clam Harbour River Formation, Goose Harbour Lake Member (CHcrg)
 - Brown box: Horton Group, Clam Harbour River Formation, Englands Lake Member (CHcre)
- Bedrock Geology (1:100,000)**
- Light green box: Horton Group, Clam Harbour River Formation (CHCHR)
- Project Components**
- ⊕ Kilometre Post (Approximate Distance from Origin)
 - Red line: Assessment Corridor
 - Purple line: Existing Pipeline Right of Way
 - - - Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Bedrock Geology data provided by the Government of Nova Scotia.

0 0.25 0.5 0.75 1
Kilometres

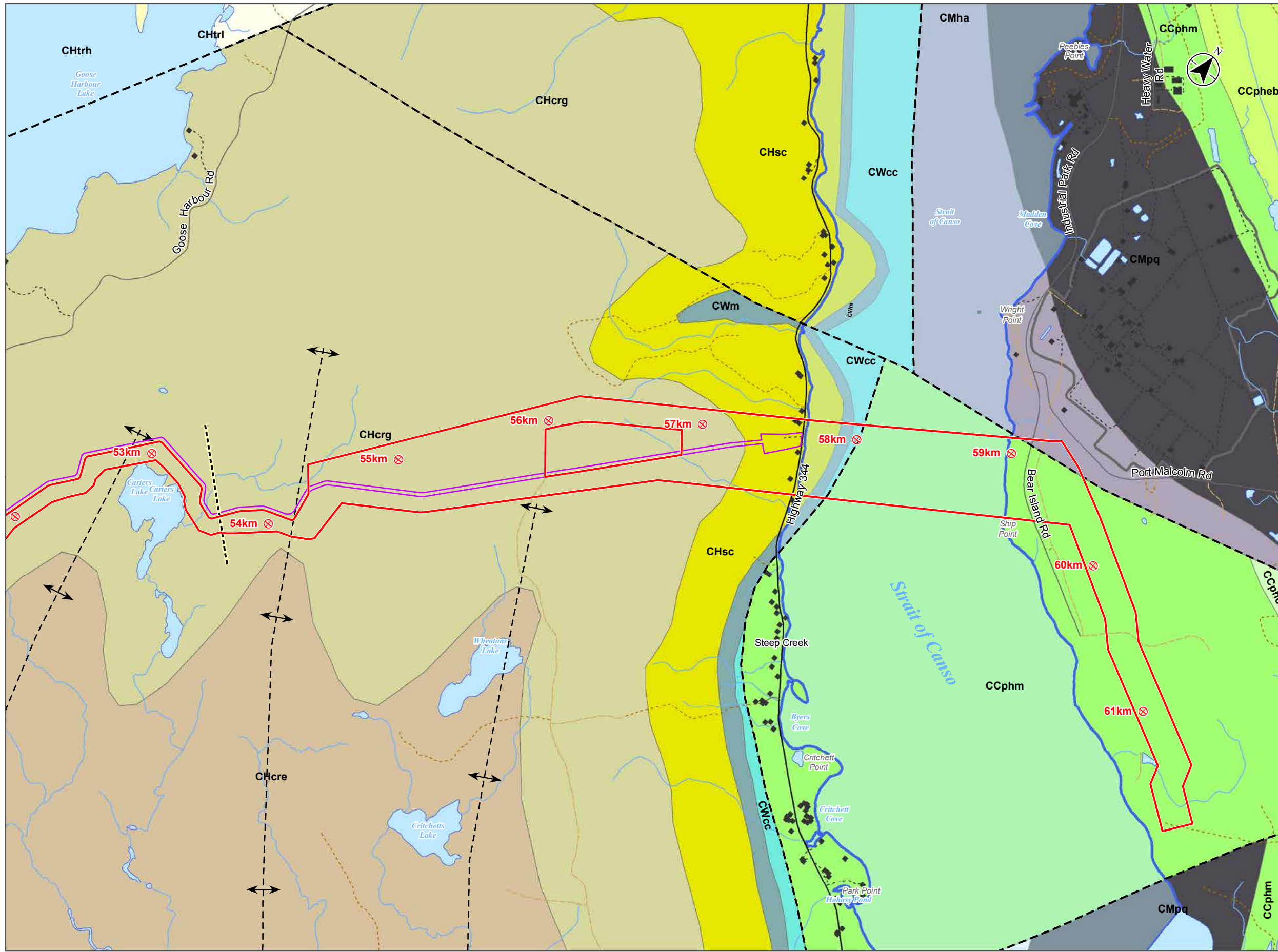
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Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

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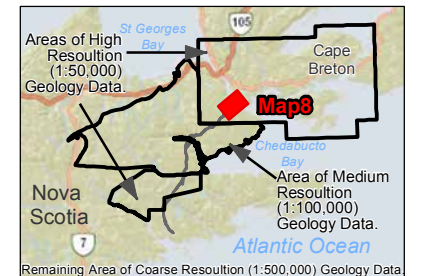
Bedrock Geology in the Vicinity of the Assessment Corridor

- Study Features**
- ↕↕↕↕ Anticline
 - ↕↕↕↕ Syncline
 - - - Fault - approximate
- Bedrock Geology (1:50,000)**
- Light Green: Cumberland Group, Port Hood Formation, Colindale Member (CCphc)
 - Light Green: Cumberland Group, Port Hood Formation, Margaree Member (CCphm)
 - Light Green: Cumberland Group, Port Hood Formation, Emery Brook Member (CCpheb)
 - Dark Grey: Mabou Group, Pomquet Formation (CMpq)
 - Grey: Mabou Group, Hastings Formation (CMha)
 - Light Blue: Windsor Group, Carrolls Corner Formation (CWcc)
 - Dark Blue: Windsor Group, Macumber and Gays River Formations (CWm)
 - Yellow: Horton Group, Steep Creek Formation (CHsc)
 - Light Yellow: Horton Group, Tracadie Road Formation, Lincolnville Member (CHtrl)
 - Yellow: Horton Group, Tracadie Road Formation, Halfmoon Lake Member (CHtrh)
 - Orange: Horton Group, Clam Harbour River Formation, Goose Harbour Lake Member (CHcrg)
 - Brown: Horton Group, Clam Harbour River Formation, Englands Lake Member (CHcre)
- Project Components**
- ⊕ Kilometre Post (Approximate Distance from Origin)
 - Red Line: Assessment Corridor
 - Purple Line: Existing Pipeline Right of Way
 - - - Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Bedrock Geology data provided by the Government of Nova Scotia.

0 0.25 0.5 0.75 1
Kilometres

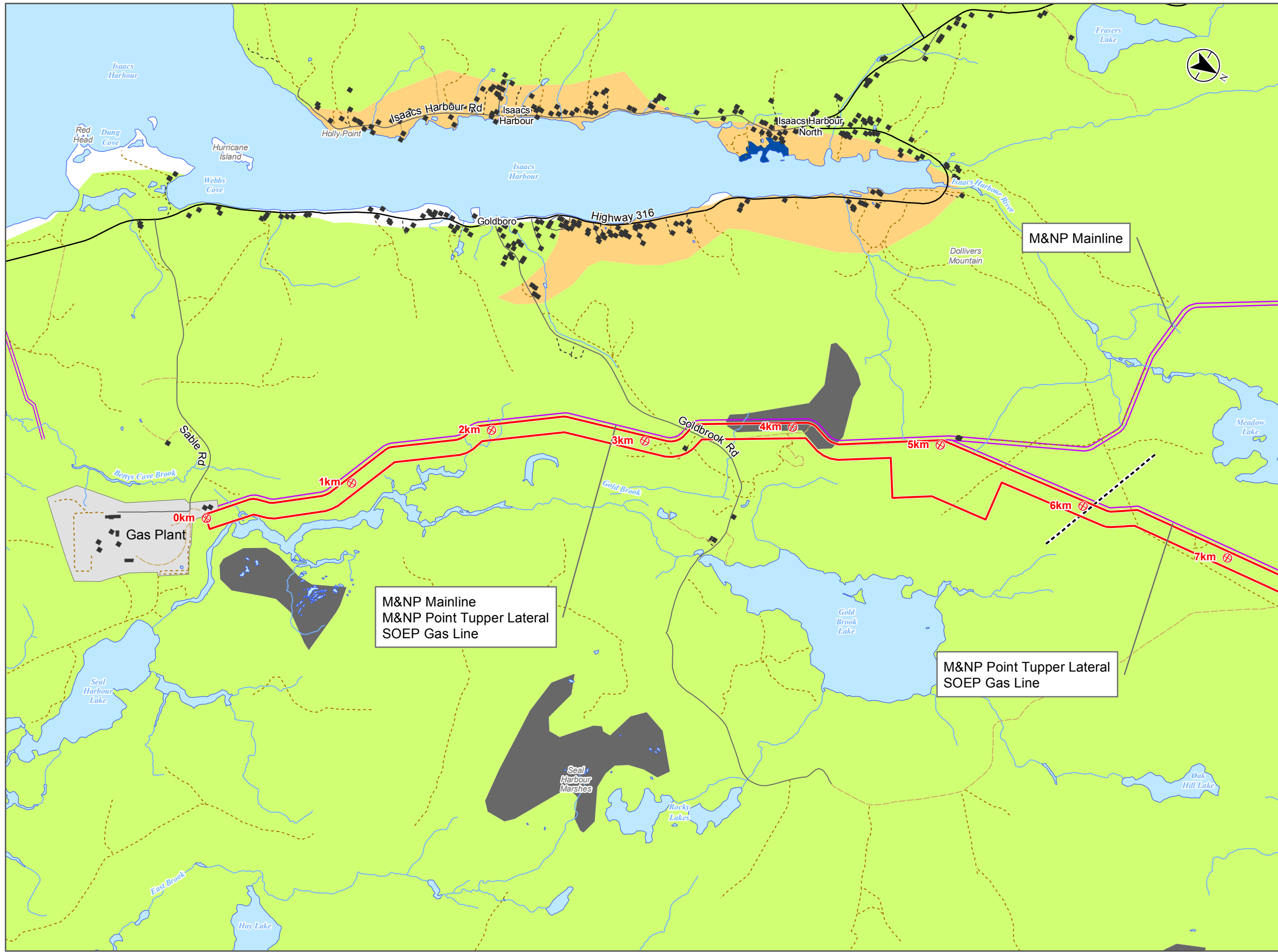
ST NS 121413598-102 Rev A NAD 1983 CSRS UTM Zone 20N



Disclaimer: This map is for illustrative purposes to support this Stantec project; questions can be directed to the issuing agency.

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Surficial Geology in the Vicinity of the Assessment Corridor

Surficial Geology (with Thickness)

- Organic Deposits (Bogs 1-5m, swamps < 2m)
- Kame Fields (kames 4-20m, Kame Terraces 3-20m) and Esker Systems (5m)
- Stony Till Plain (2-20m)

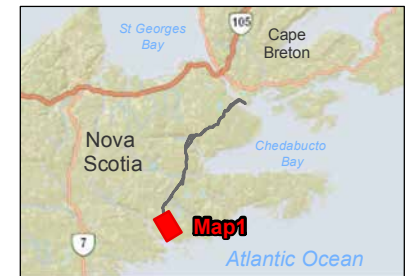
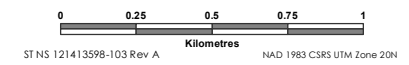
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor
- Existing Pipeline Right of Way

Map Features

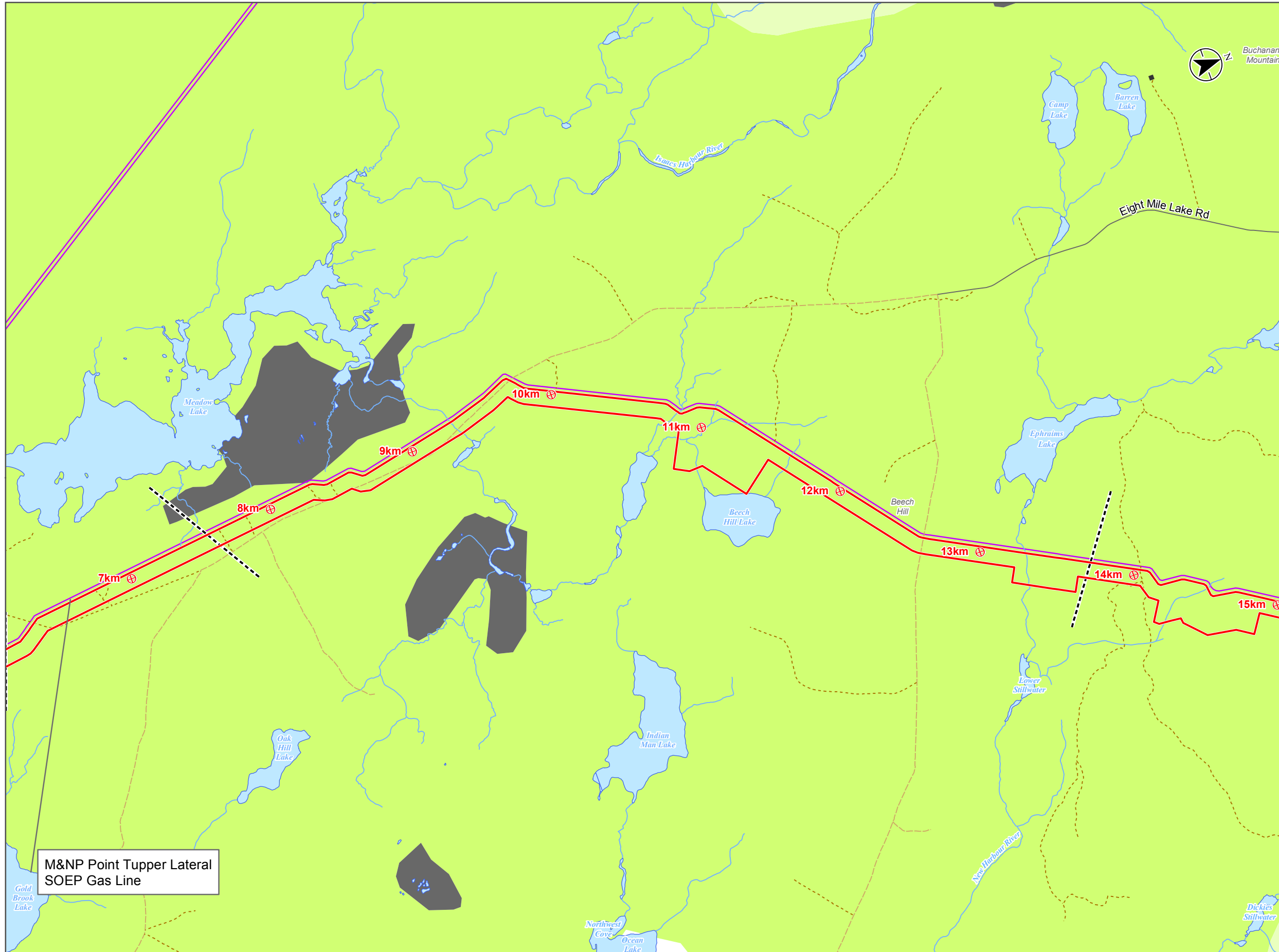
- Building/Structure
- Collector/Arterial Road
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Industrial
- Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Surficial Geology data provided by the Government of Nova Scotia.



Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.





M&NP Point Tupper Lateral SOEP Gas Line

Surficial Geology in the Vicinity of the Assessment Corridor

Surficial Geology (with Thickness)

- Organic Deposits (Bogs 1-5m, swamps < 2m)
- Hummocky Ground Moraine (2 -25m)
- Stony Till Plain (2-20m)

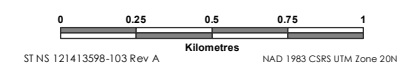
Project Components

- + Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor
- Existing Pipeline Right of Way

Map Features

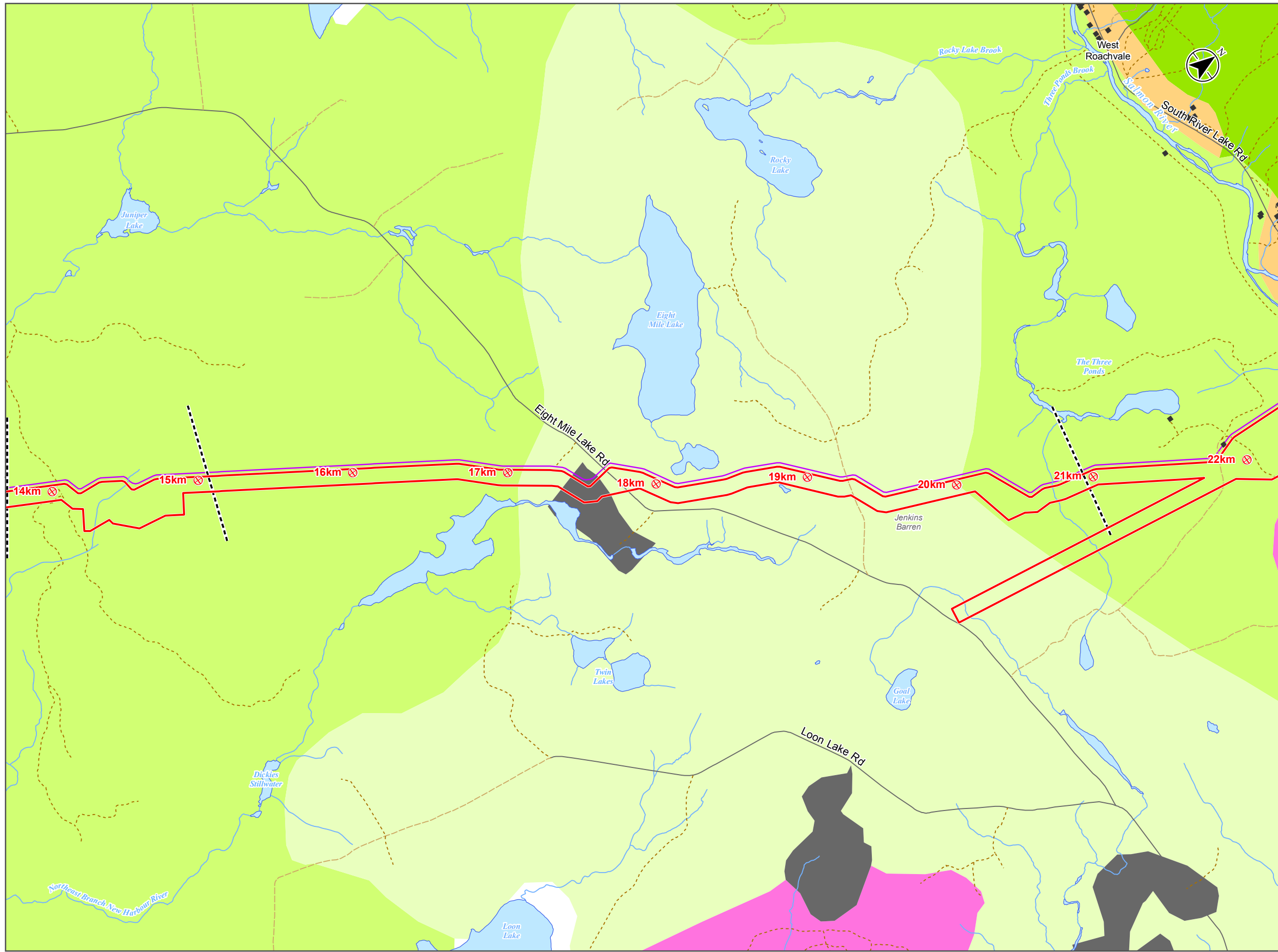
- Building/Structure
- Local Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Industrial
- Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Surficial Geology data provided by the Government of Nova Scotia.



Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.
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Surficial Geology in the Vicinity of the Assessment Corridor

Surficial Geology (with Thickness)

- Organic Deposits (Bogs 1-5m, swamps < 2m)
- Kame Fields (kames 4-20m, Kame Terraces 3-20m) and Esker Systems (5m)
- Hummocky Ground Moraine (2 -25m)
- Stony Till Plain (2-20m)
- Silty Till Plain (3-30m)
- Bedrock (unknown)

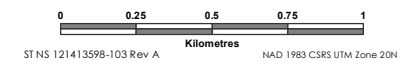
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor
- Existing Pipeline Right of Way

Map Features

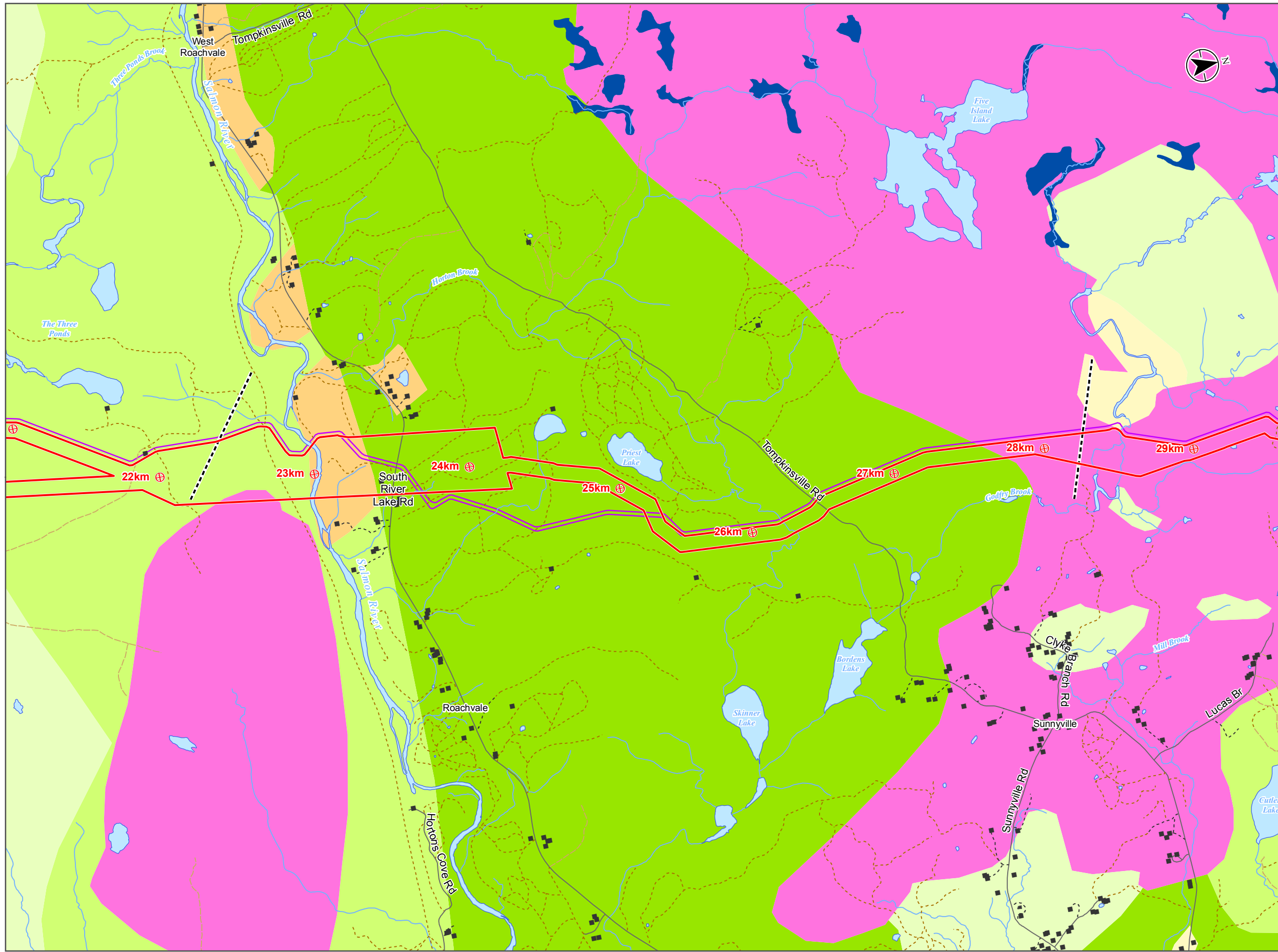
- Building/Structure
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Industrial
- Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Surficial Geology data provided by the Government of Nova Scotia.



Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.
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Surficial Geology in the Vicinity of the Assessment Corridor

- Surficial Geology (with Thickness)**
- Alluvial Deposits (<1m in small streams to 20m in large floodplains)
 - Kame Fields (kames 4-20m, Kame Terraces 3-20m) and Esker Systems (5m)
 - Hummocky Ground Moraine (2 -25m)
 - Stony Till Plain (2-20m)
 - Silty Till Plain (3-30m)
 - Bedrock (unknown)
- Project Components**
- ⊕ Kilometre Post (Approximate Distance from Origin)
 - Assessment Corridor
 - Existing Pipeline Right of Way
- Map Features**
- Building/Structure
 - Local Road
 - Private/Restricted Road
 - Seasonal Road
 - Track/Trail
 - Watercourse
 - Waterbody
 - Industrial
 - Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Surficial Geology data provided by the Government of Nova Scotia.

0 0.25 0.5 0.75 1
Kilometres

STNS 121413598-103 Rev A NAD 1983 CSRS UTM Zone 20N



Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.





Surficial Geology in the Vicinity of the Assessment Corridor

Surficial Geology (with Thickness)

- Organic Deposits (Bogs 1-5m, swamps < 2m)
- Alluvial Deposits (<1m in small streams to 20m in large floodplains)
- Kame Fields (kames 4-20m, Kame Terraces 3-20m) and Esker Systems (5m)
- Hummocky Ground Moraine (2 -25m)
- Stony Till Plain (2-20m)
- Silty Till Plain (3-30m)
- Bedrock (unknown)

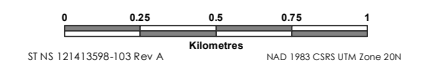
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor
- Existing Pipeline Right of Way

Map Features

- Building/Structure
- Collector/Arterial Road
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Industrial
- Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Surficial Geology data provided by the Government of Nova Scotia.



Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.
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Surficial Geology in the Vicinity of the Assessment Corridor

Surficial Geology (with Thickness)

- Organic Deposits (Bogs 1-5m, swamps < 2m)
- Alluvial Deposits (<1m in small streams to 20m in large floodplains)
- Silty Till Plain (3-30m)
- Silty Drumlin (4-30m)
- Bedrock (unknown)

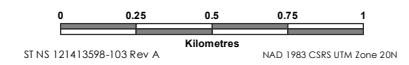
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor
- Existing Pipeline Right of Way

Map Features

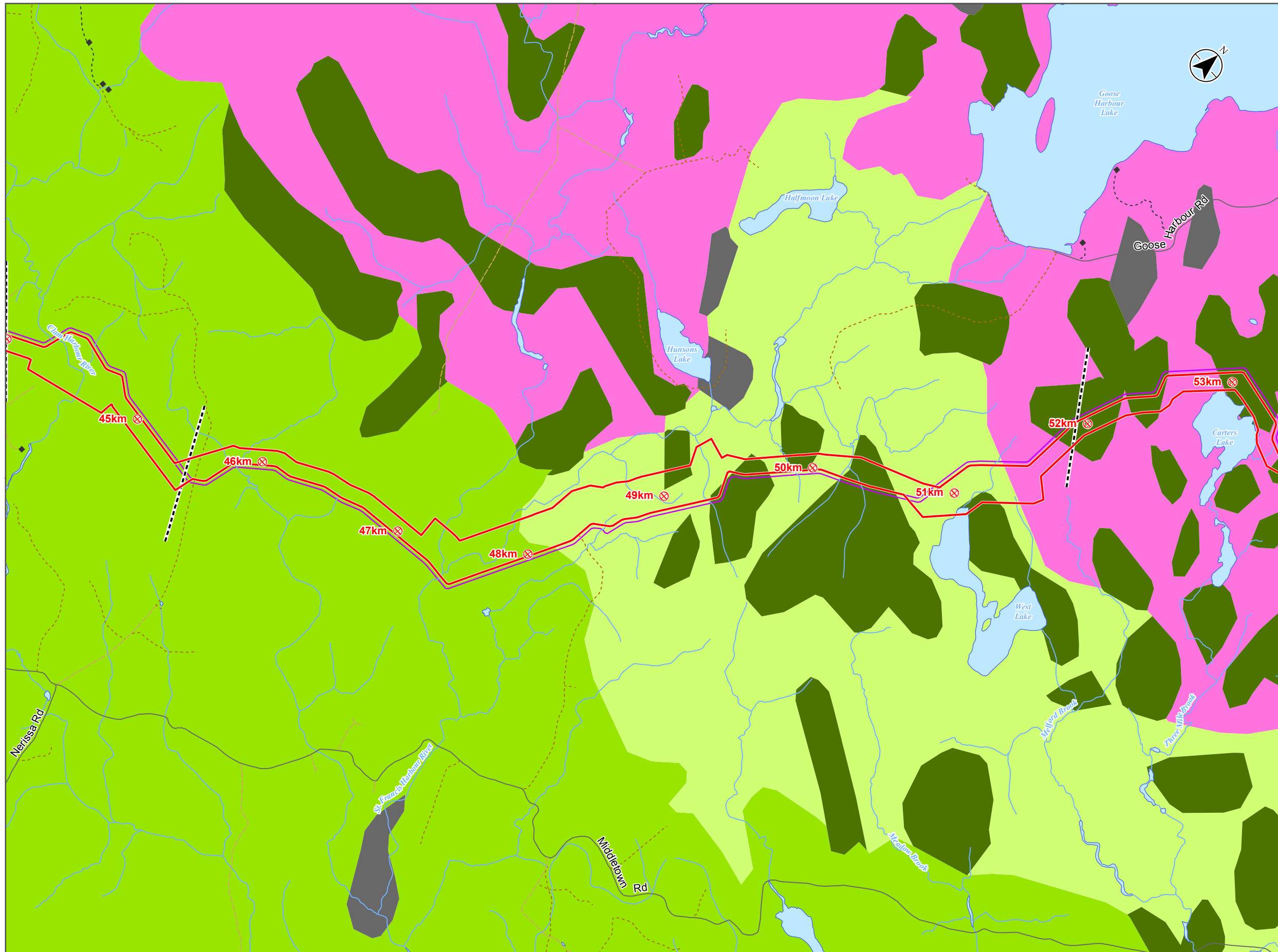
- Building/Structure
- Collector/Arterial Road
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Industrial
- Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Surficial Geology data provided by the Government of Nova Scotia.



Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.
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Surficial Geology in the Vicinity of the Assessment Corridor

Surficial Geology (with Thickness)

- Organic Deposits (Bogs 1-5m, swamps < 2m)
- Stony Till Plain (2-20m)
- Silty Till Plain (3-30m)
- Silty Drumlin (4-30m)
- Bedrock (unknown)

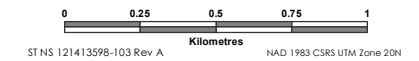
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor
- Existing Pipeline Right of Way

Map Features

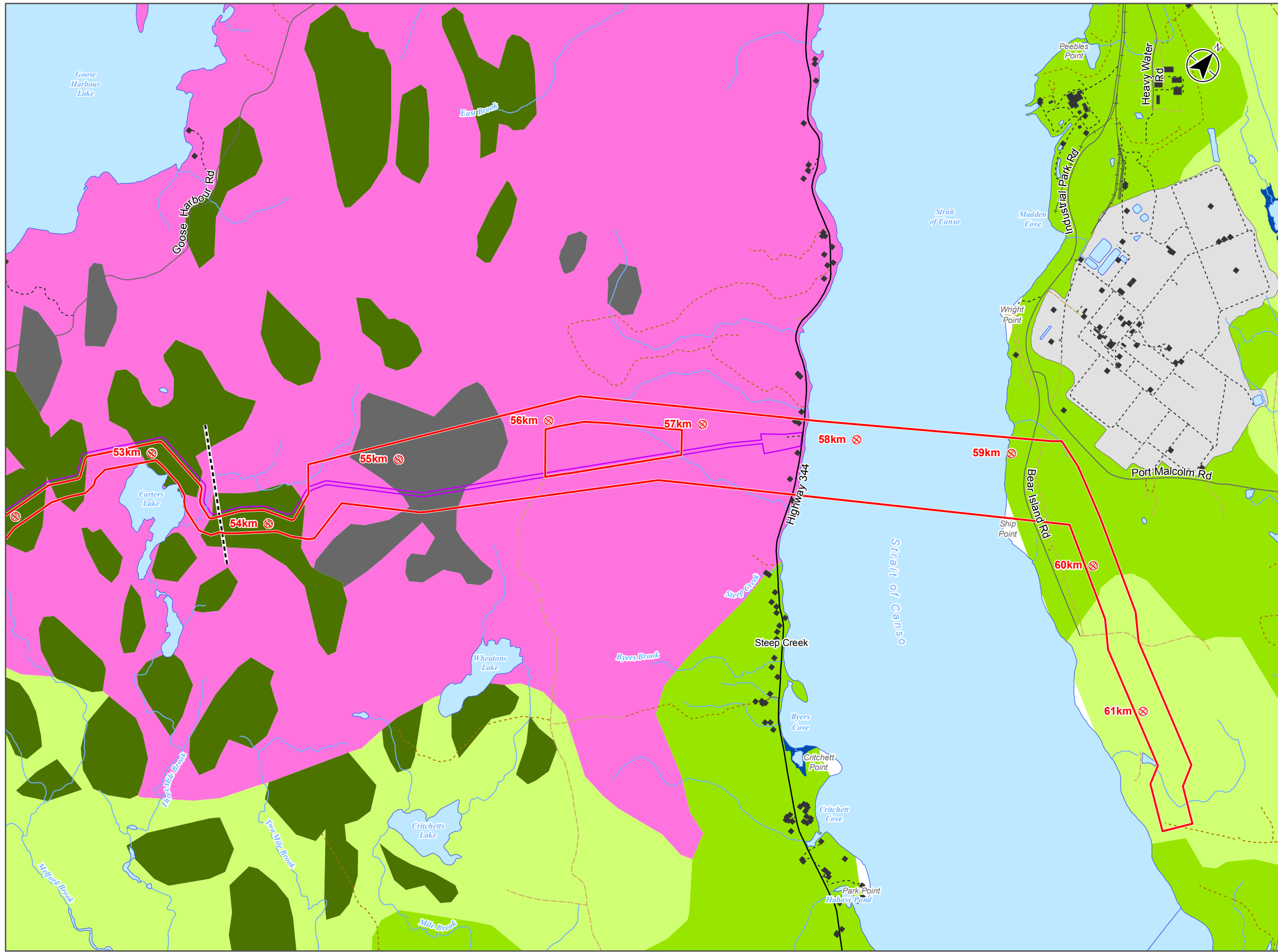
- Building/Structure
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Industrial
- Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Surficial Geology data provided by the Government of Nova Scotia.



Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.
BEAR PAW PIPELINE PROJECT





Surficial Geology in the Vicinity of the Assessment Corridor

Surficial Geology (with Thickness)

- Organic Deposits (Bogs 1-5m, swamps < 2m)
- Stony Till Plain (2-20m)
- Silty Till Plain (3-30m)
- Silty Drumlin (4-30m)
- Bedrock (unknown)

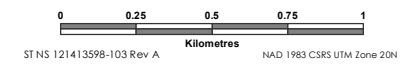
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor
- Existing Pipeline Right of Way

Map Features

- Building/Structure
- Collector/Arterial Road
- Local Road
- Private/Restricted Road
- Railway
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Industrial
- Map Sheet Match Line

Sources: Base data provided by the Government of Canada and Nova Scotia. Surficial Geology data provided by the Government of Nova Scotia.



Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.

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March 2016

APPENDIX E VEGETATION AND WETLANDS DATA AND MAPBOOK



March 2016

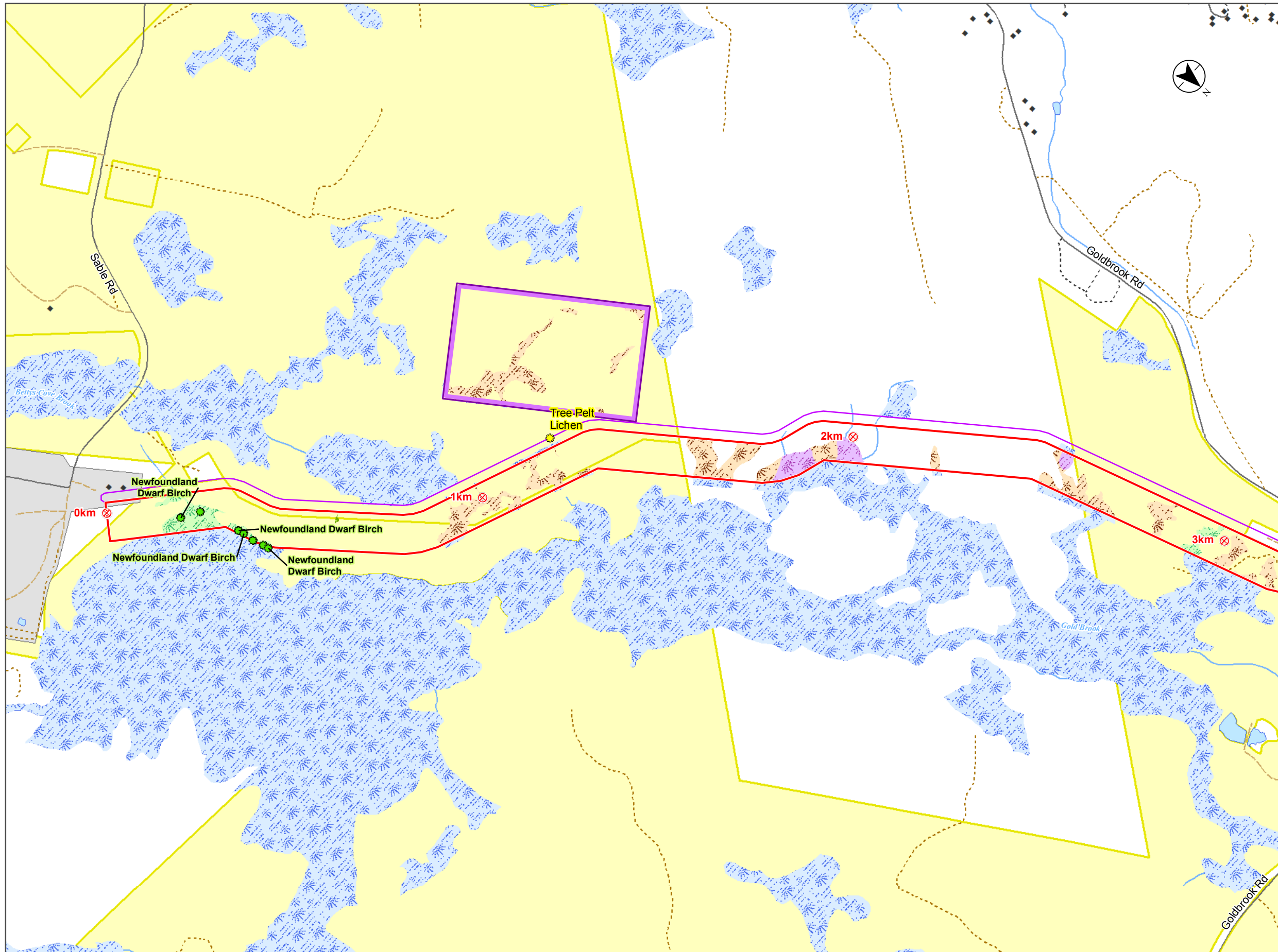
March 2016

APPENDIX E1 WETLANDS AND PLANT SPECIES OF CONSERVATION INTEREST MAPBOOK



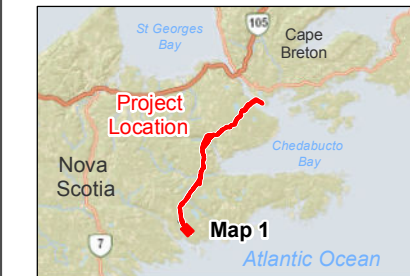
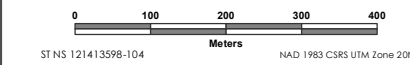
March 2016

Wetlands and Plant Species of Conservation Interest



- Study Features**
- Species Observation - Desktop**
- Atlantic Canada Conservation Data Centre*
- Species Observation - Field**
- Vascular Plant
- Wetland (Class/Type)**
- Bog
 - Fen
 - Marsh
 - Softwood Treed Swamp
 - Wetland
- Project Components**
- Kilometre Post (Approximate Distance from Origin)
 - Assessment Corridor / Local Assessment Area (LAA)
 - Potential Head Compressor Site/ Local Assessment Area (LAA)
 - Existing Pipeline Right of Way
- Map Features**
- Building/Structure
 - Local Road
 - Private/Restricted Road
 - Seasonal Road
 - Track/Trail
 - Watercourse
 - Waterbody
 - Crown Land

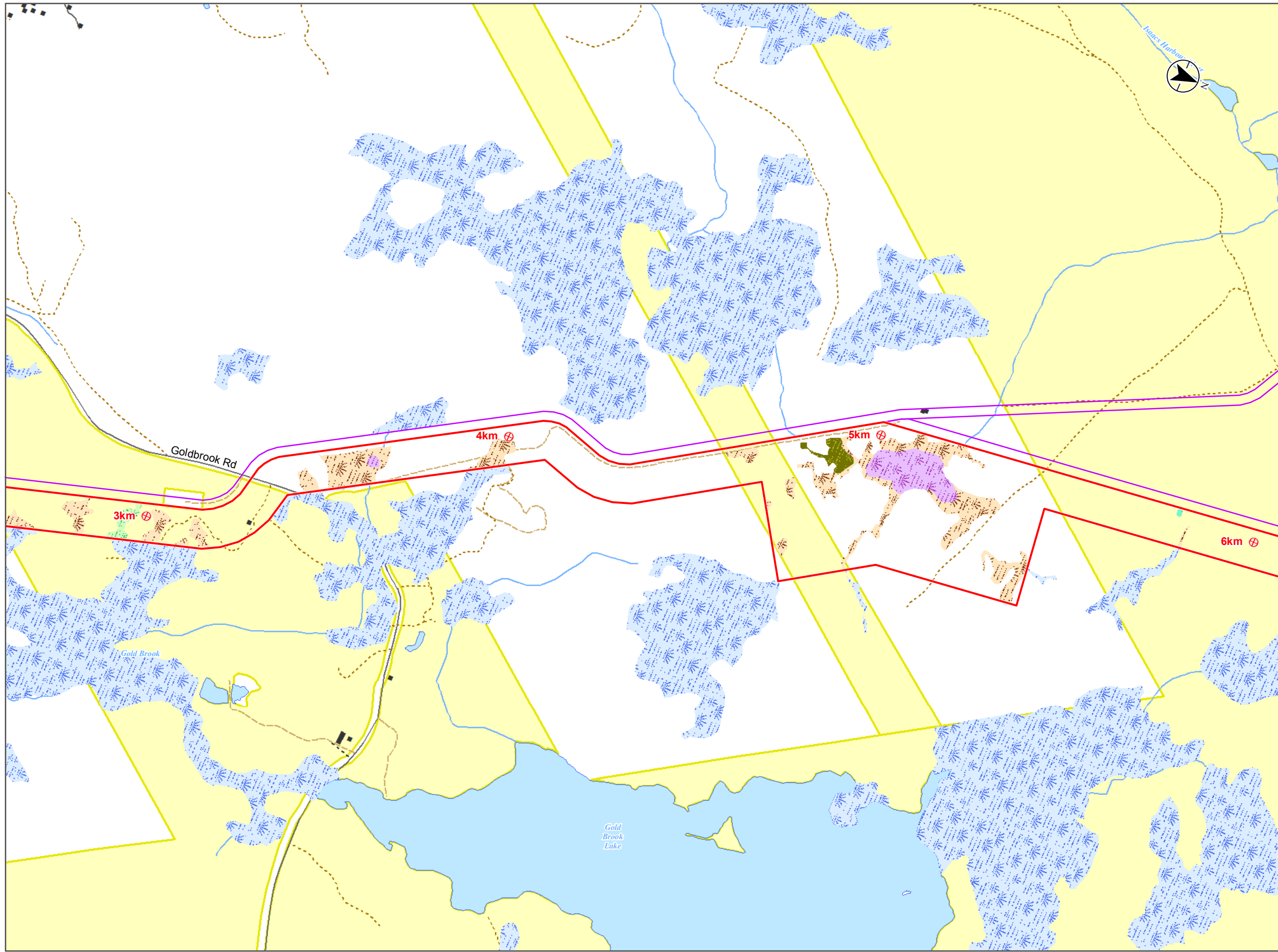
Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
 *ACCDC observations with accuracy ± 1 km shown on mapping. Results within the assessment corridor, on crown land, are derived from field surveys; all other results are based on desktop information.



Disclaimer: This map is for illustrative purposes to support this project; questions can be directed to the issuing agency.
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Wetlands and Plant Species of Conservation Interest



Study Features

Wetland (Class/Type)

- Bog
- Fen
- Shrub Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

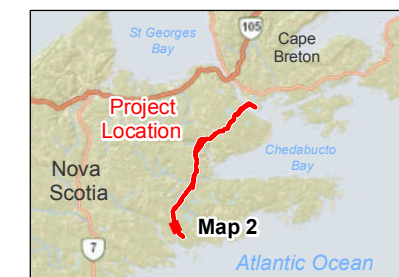
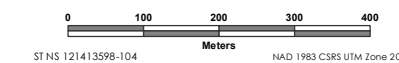
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

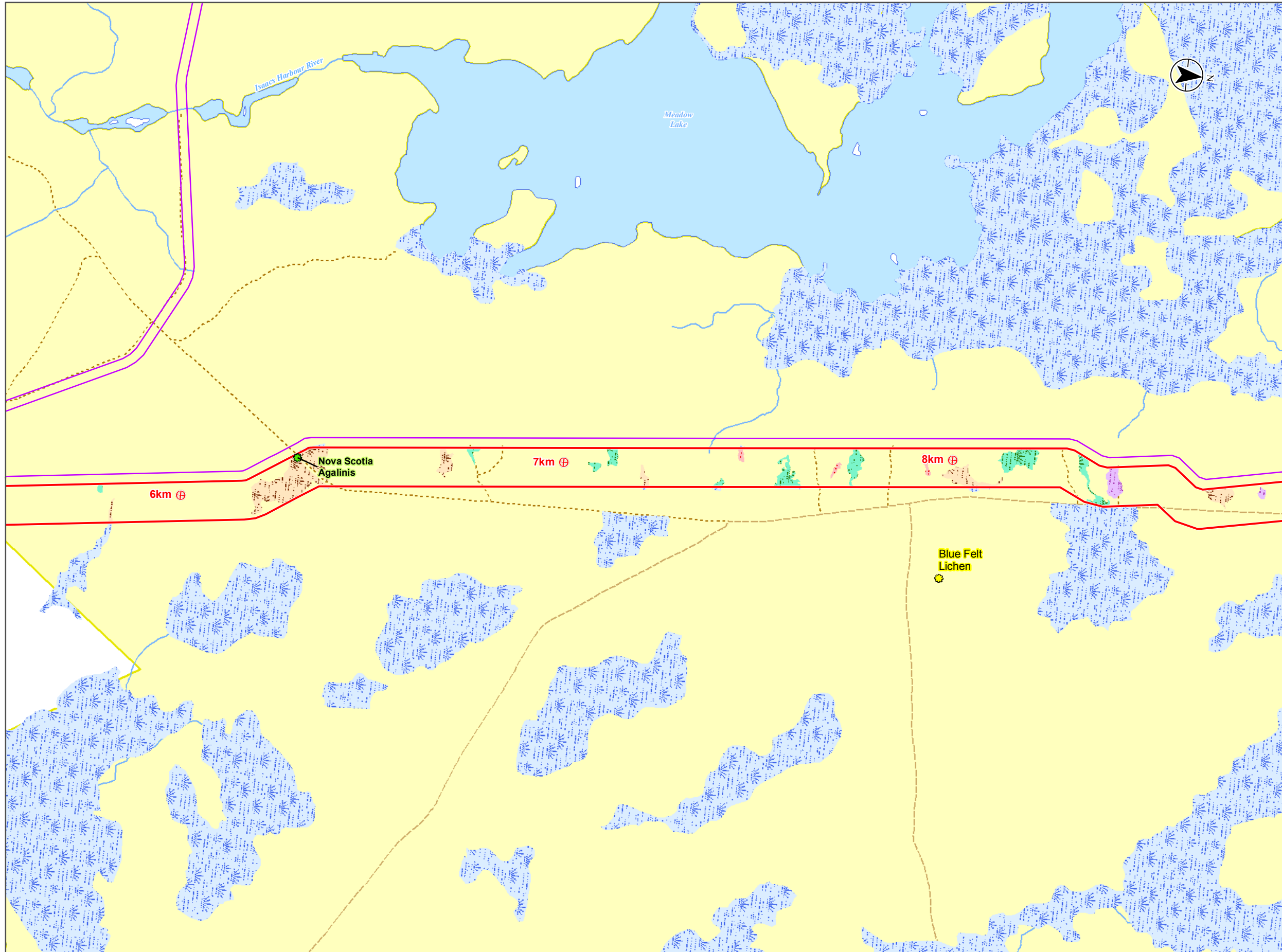
- Building/Structure
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
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Wetlands and Plant Species of Conservation Interest

Study Features

Species Observation - Desktop

- Atlantic Canada Conservation Data Centre*

Species Observation - Field

- Vascular Plant

Wetland (Class/Type)

- Bog
- Hardwood Treed Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

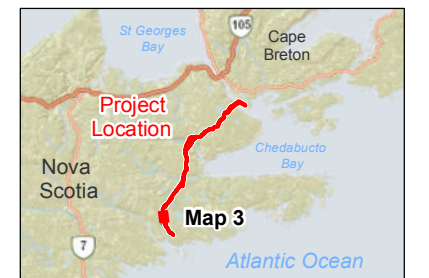
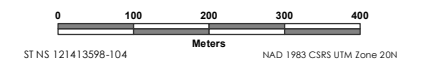
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

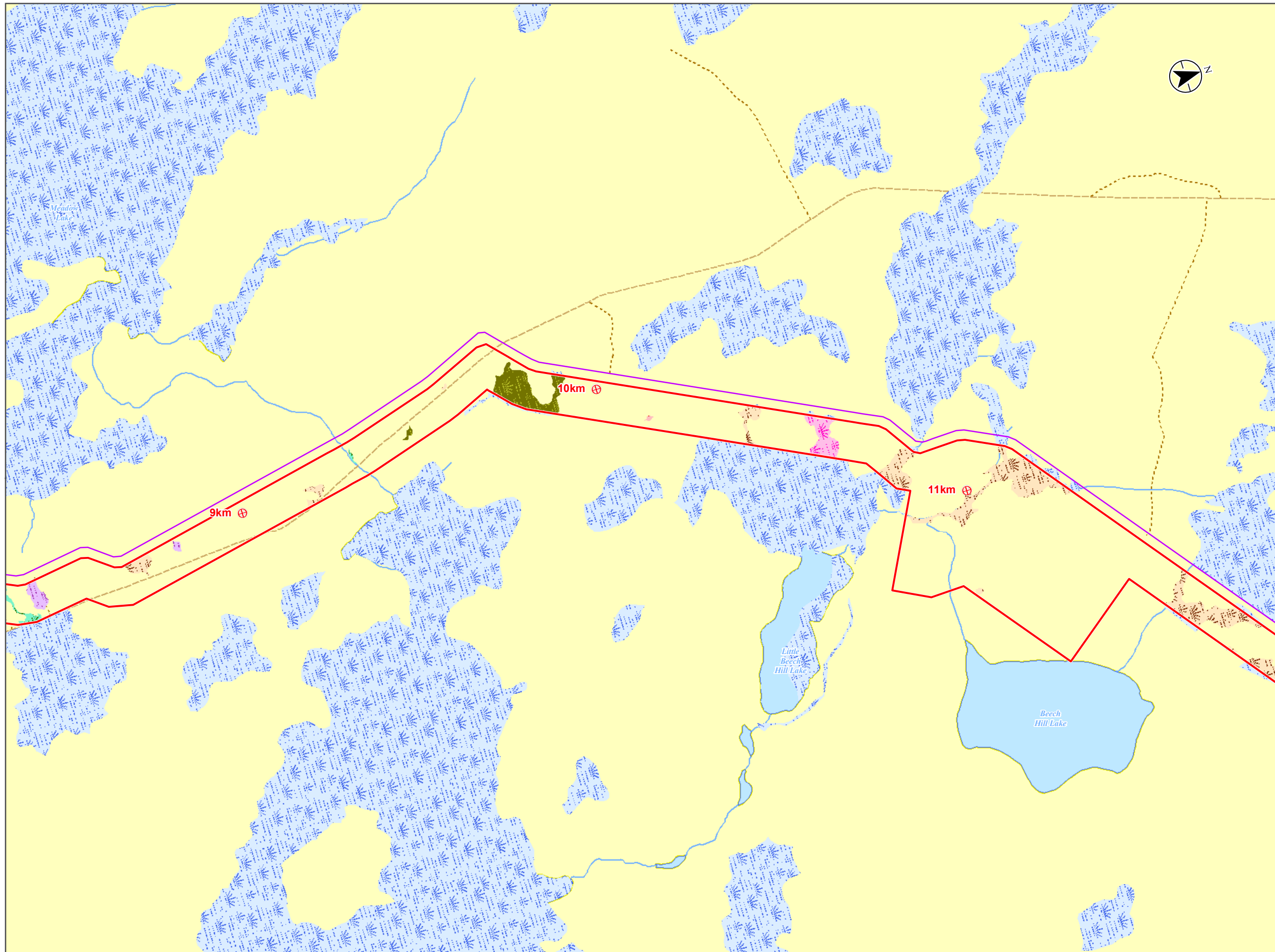
Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
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Wetlands and Plant Species of Conservation Interest



Study Features

Wetland (Class/Type)

- Bog
- Shrub Swamp
- Treed Bog
- Hardwood Treed Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

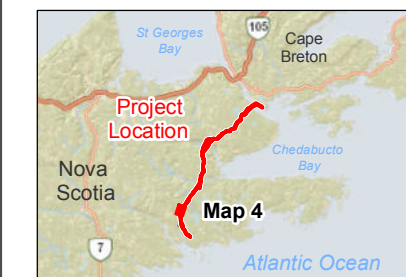
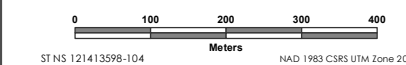
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

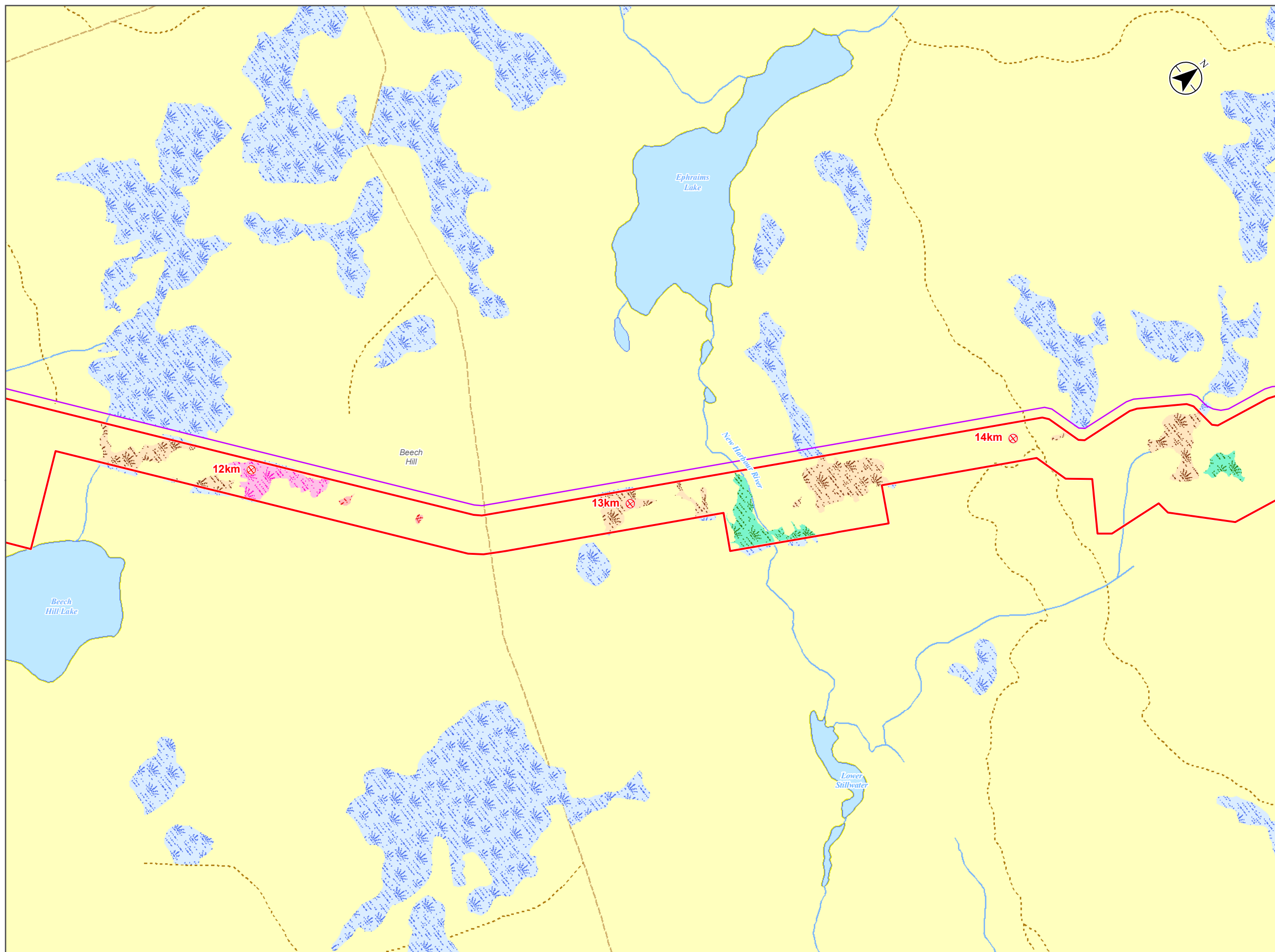
Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
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Wetlands and Plant Species of Conservation Interest



Study Features

Wetland (Class/Type)

- Treed Bog
- Hardwood Treed Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

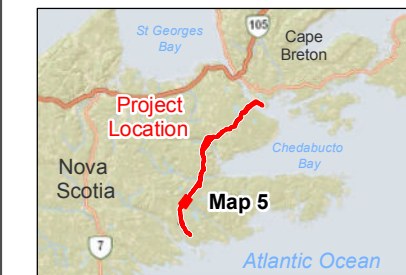
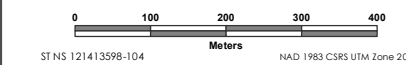
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

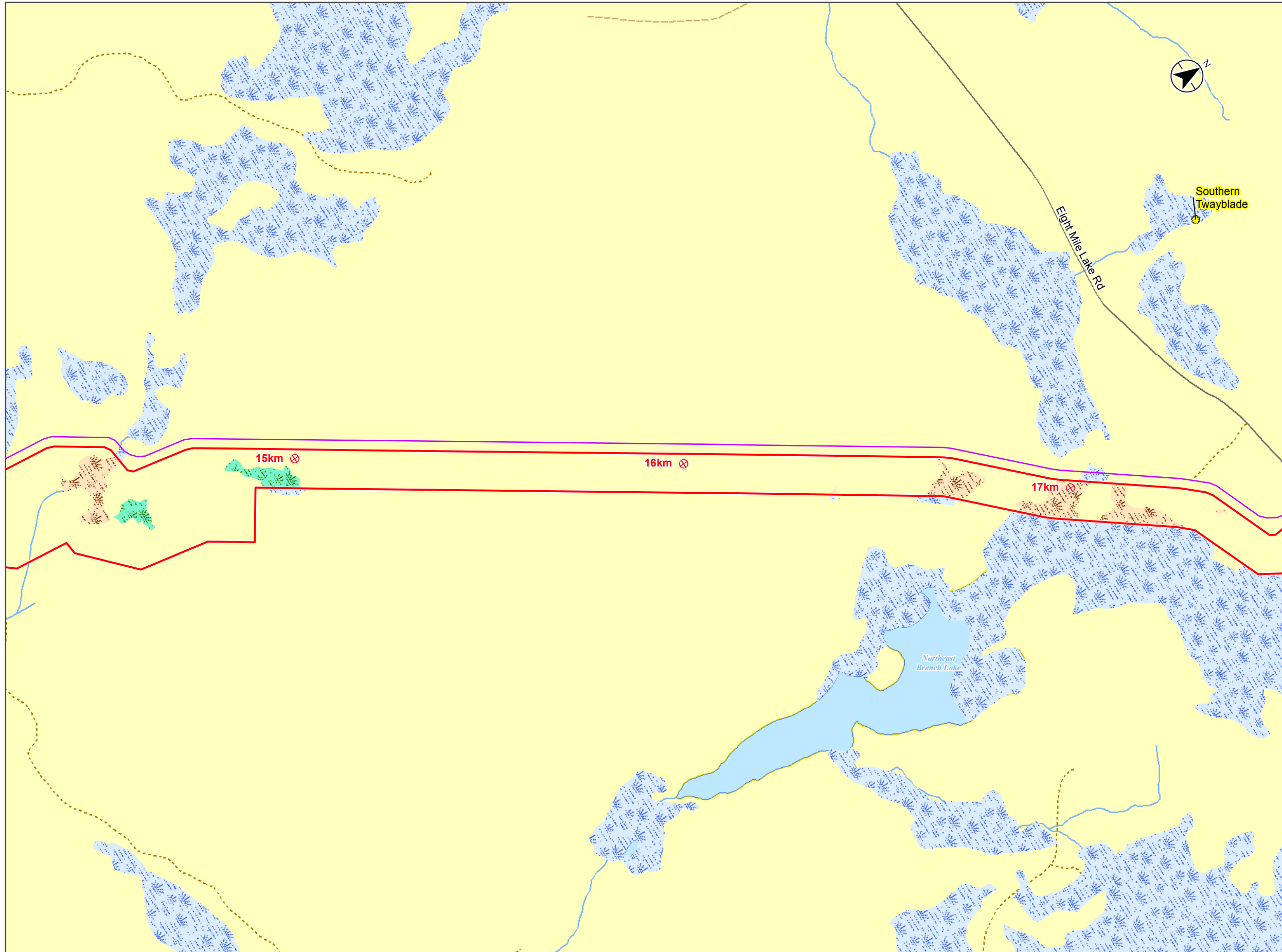
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Wetlands and Plant Species of Conservation Interest



Study Features

- Species Observation - Desktop**
- Atlantic Canada Conservation Data Centre*

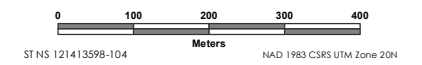
- Wetland (Class/Type)**
- Treed Bog
 - Mixedwood Treed Swamp
 - Softwood Treed Swamp
 - Wetland

- Project Components**
- Kilometre Post (Approximate Distance from Origin)
 - Assessment Corridor / Local Assessment Area (LAA)
 - Existing Pipeline Right of Way

Map Features

- Local Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

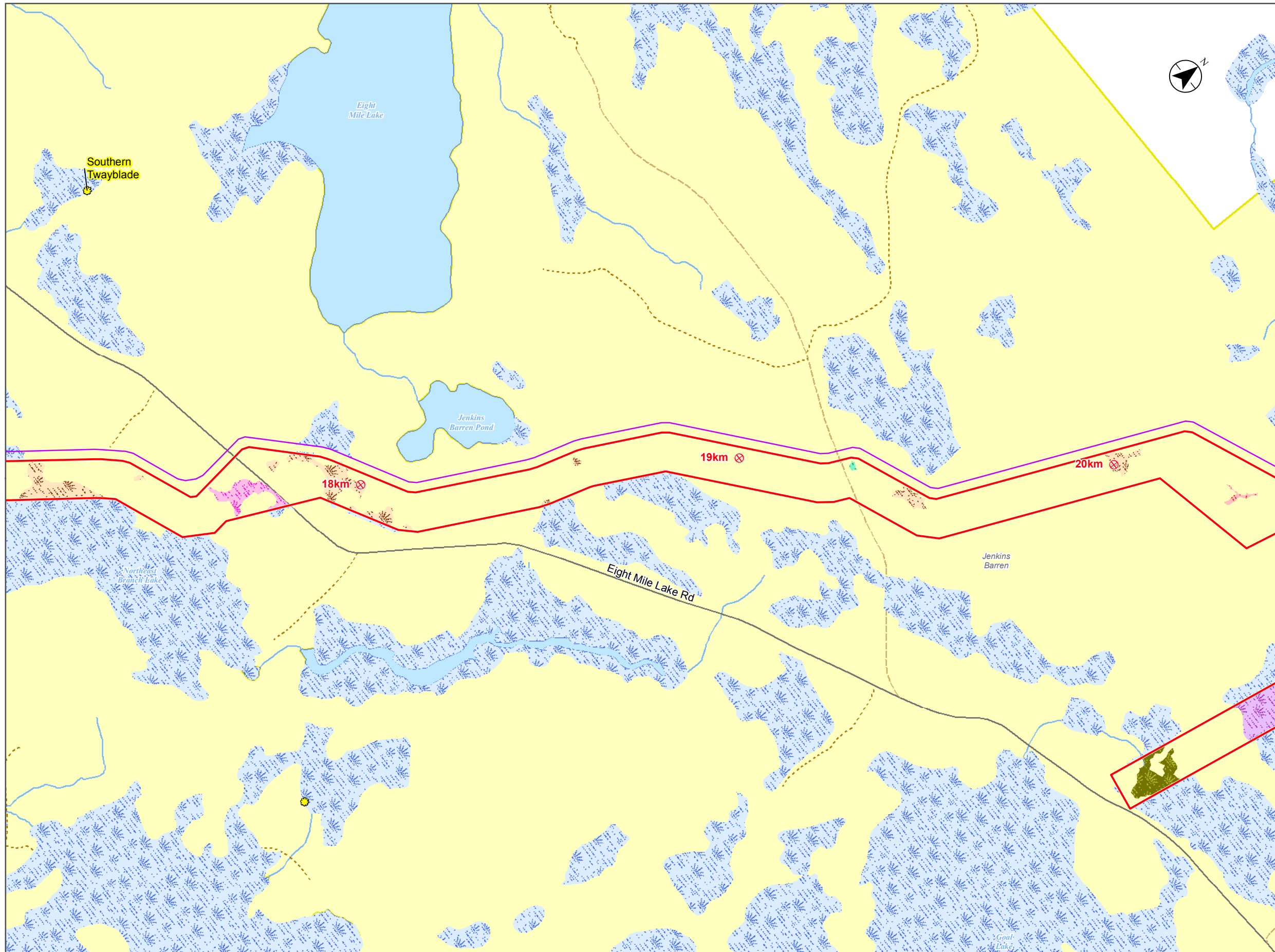
Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
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Wetlands and Plant Species of Conservation Interest



Study Features

Species Observation - Desktop

- Atlantic Canada Conservation Data Centre*

Wetland (Class/Type)

- Bog
- Shrub Swamp
- Treed Bog
- Hardwood Treed Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

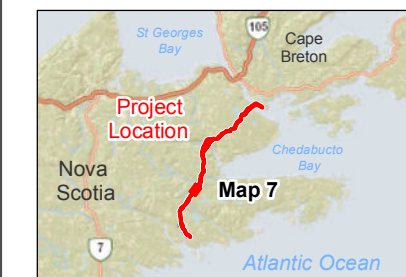
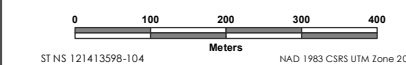
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Local Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

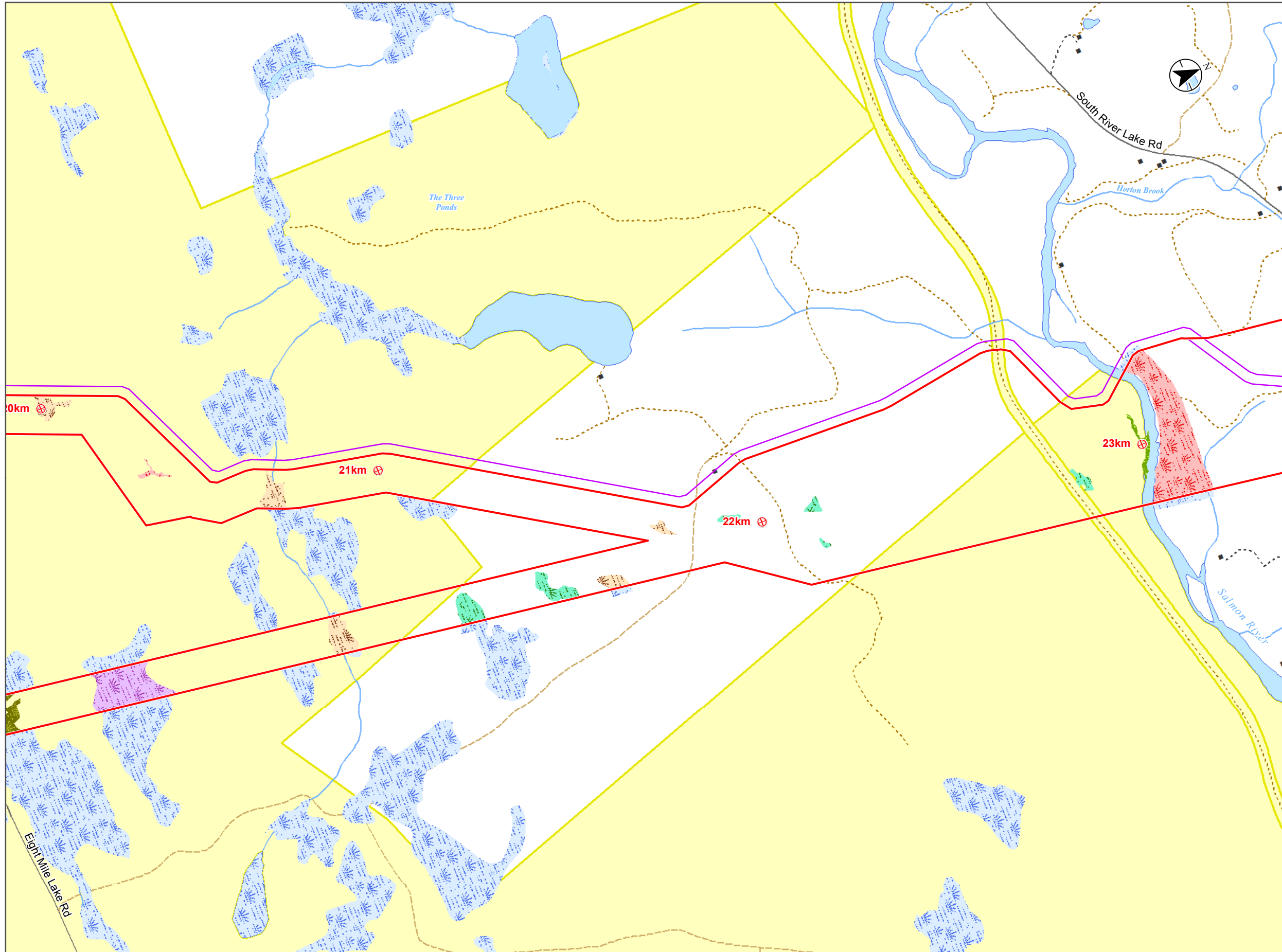
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Wetlands and Plant Species of Conservation Interest



Study Features

Wetland (Class/Type)

- Bog
- Marsh
- Shrub Swamp
- Hardwood Treed Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

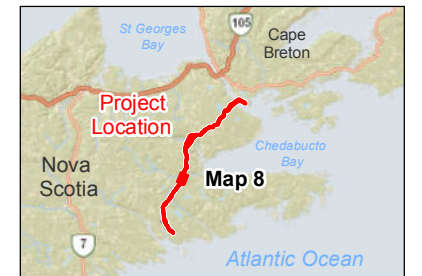
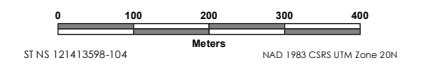
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Building/Structure
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

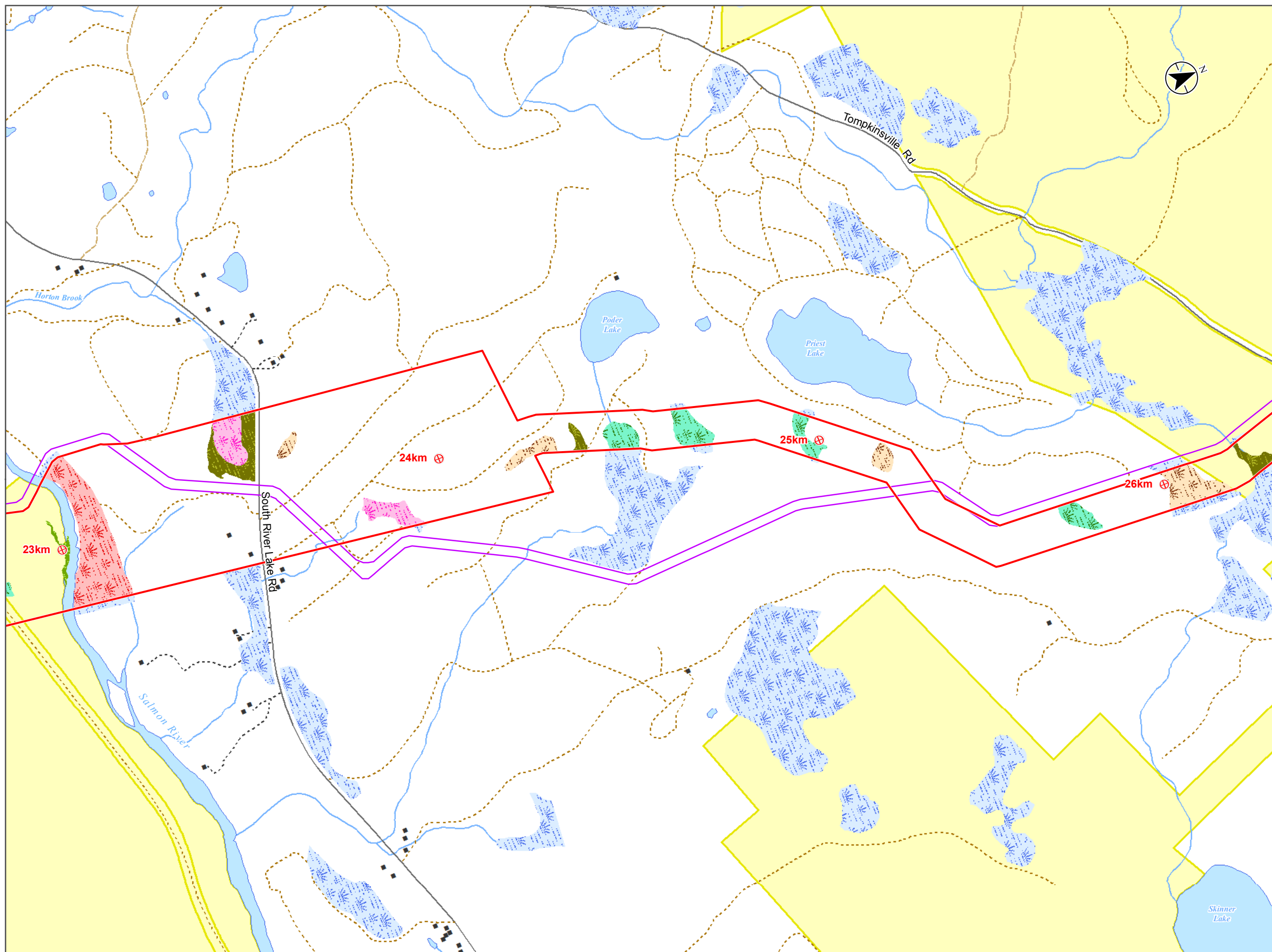
Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
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Wetlands and Plant Species of Conservation Interest



Study Features

Wetland (Class/Type)

- Marsh
- Shrub Swamp
- Treed Bog
- Hardwood Treed Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

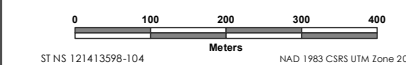
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Building/Structure
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

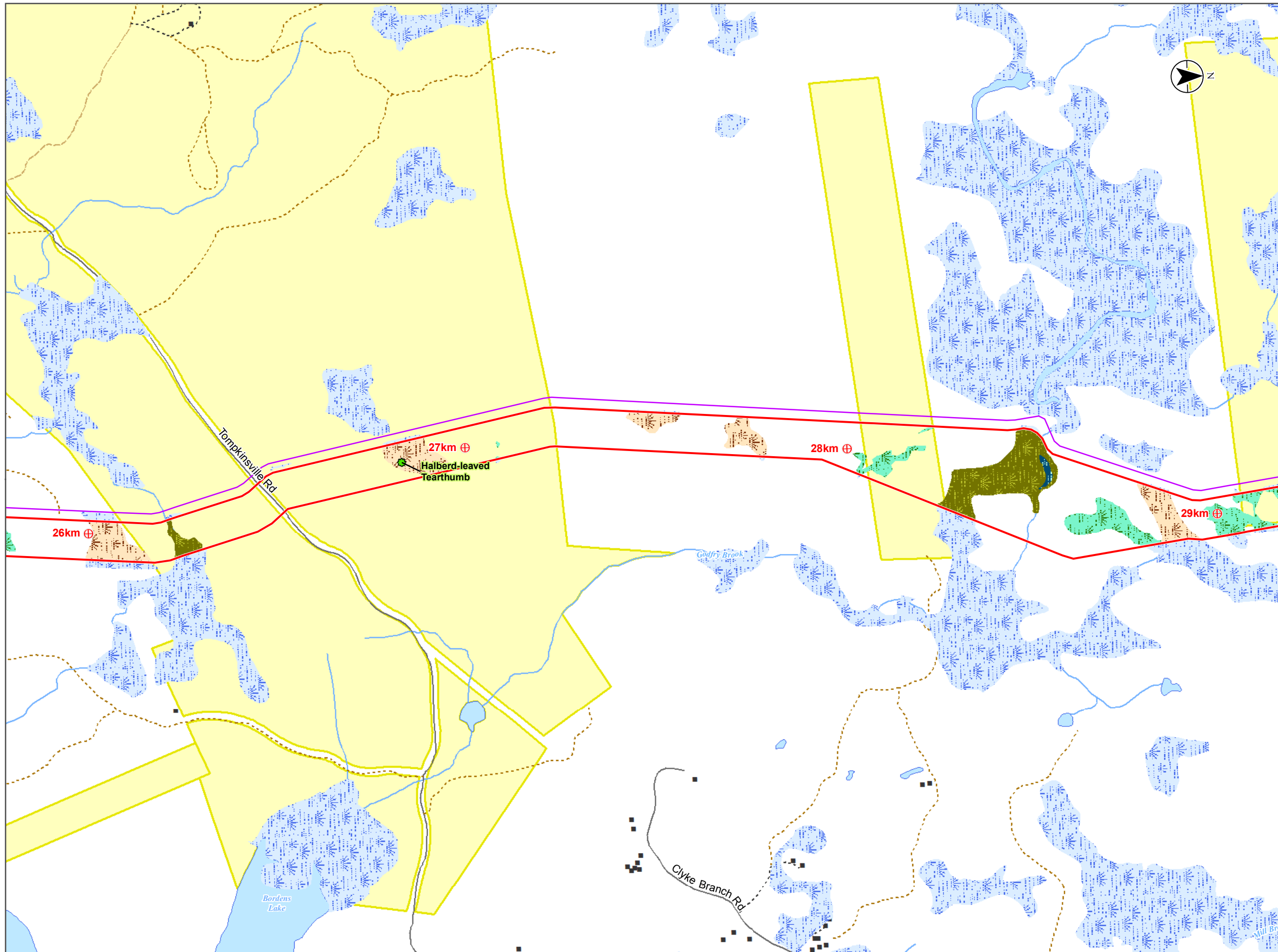
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Wetlands and Plant Species of Conservation Interest



Study Features

Species Observation - Field

- Vascular Plant

Wetland (Class/Type)

- Shallow Water
- Shrub Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

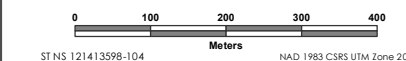
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Building/Structure
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

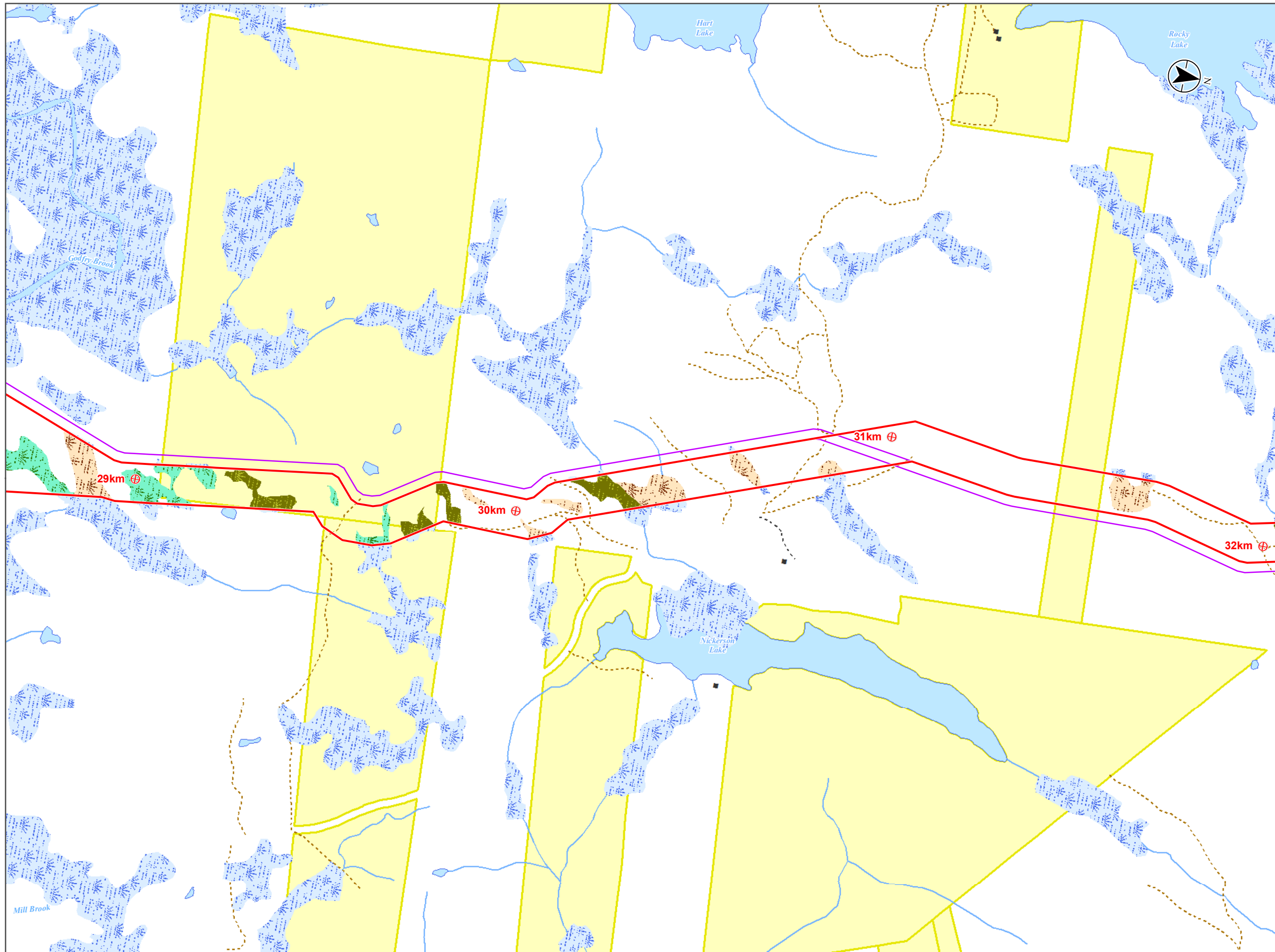
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Wetlands and Plant Species of Conservation Interest



Study Features

Wetland (Class/Type)

- Shrub Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

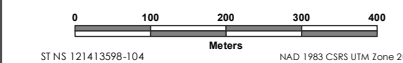
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

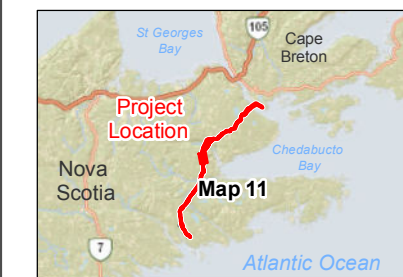
Map Features

- Building/Structure
- Private/Restricted Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

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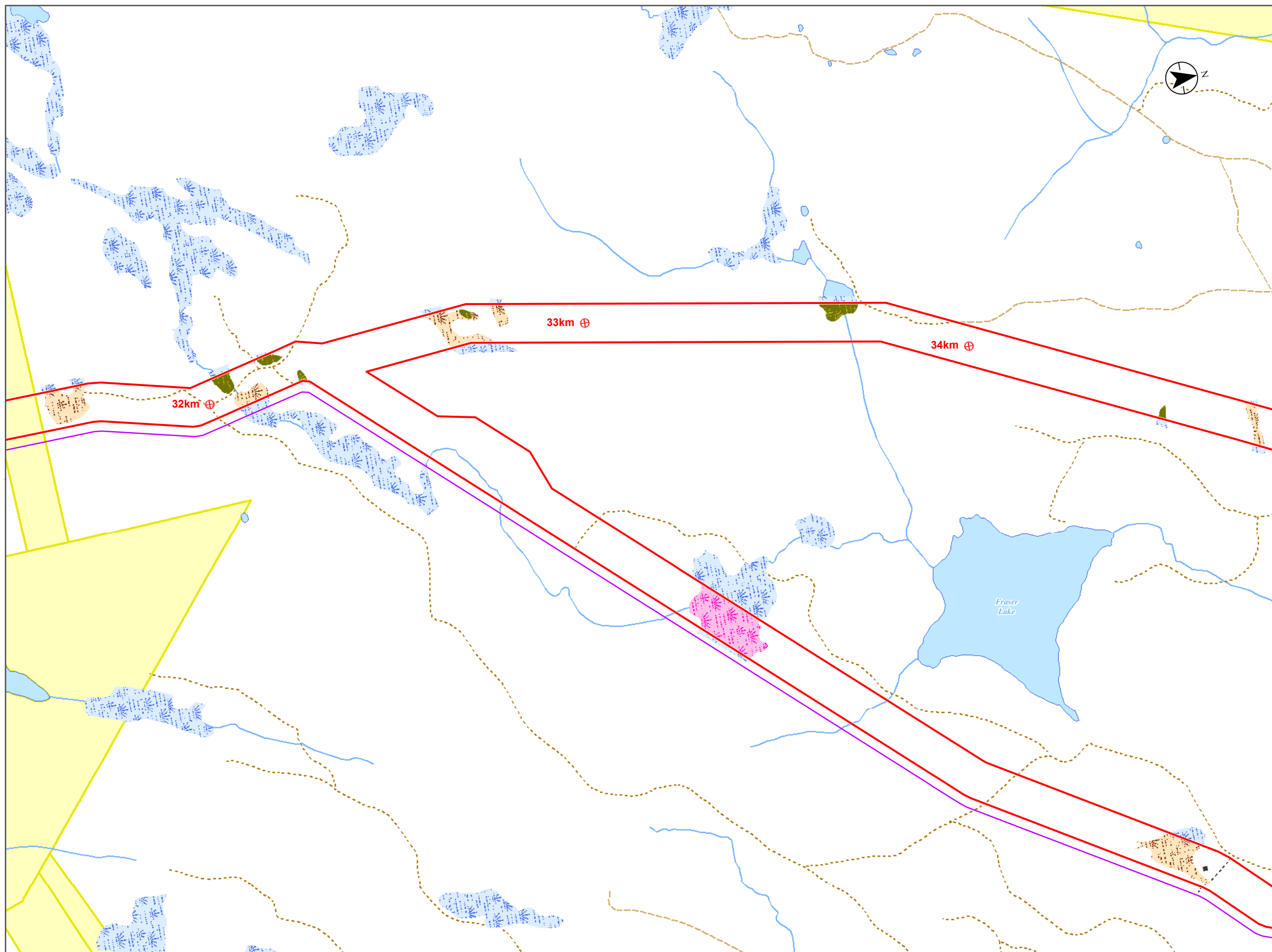
STNS 121413598-104 NAD 1983 CSRS UTM Zone 20N



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Wetlands and Plant Species of Conservation Interest



Study Features

Wetland (Class/Type)

- Shrub Swamp
- Treed Bog
- Softwood Treed Swamp
- Wetland

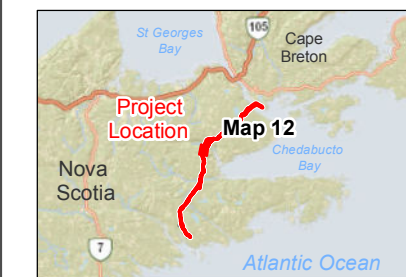
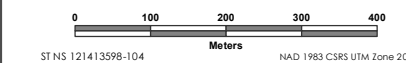
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Building/Structure
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

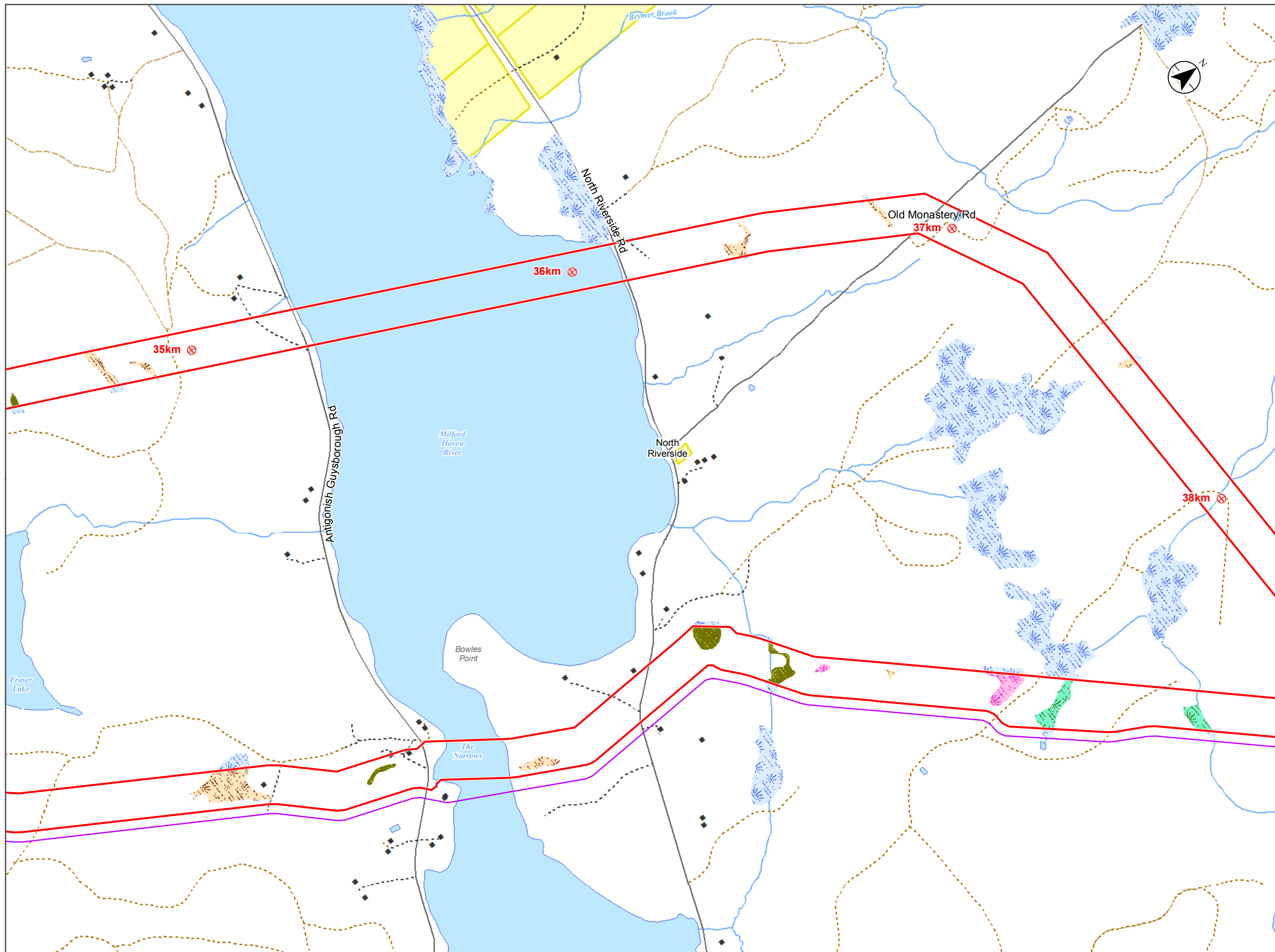
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Wetlands and Plant Species of Conservation Interest



Study Features

Wetland (Class/Type)

- Shallow Water
- Shrub Swamp
- Treed Bog
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

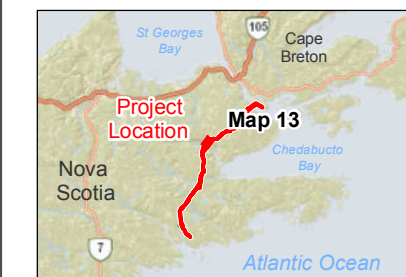
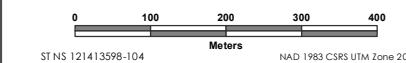
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Building/Structure
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

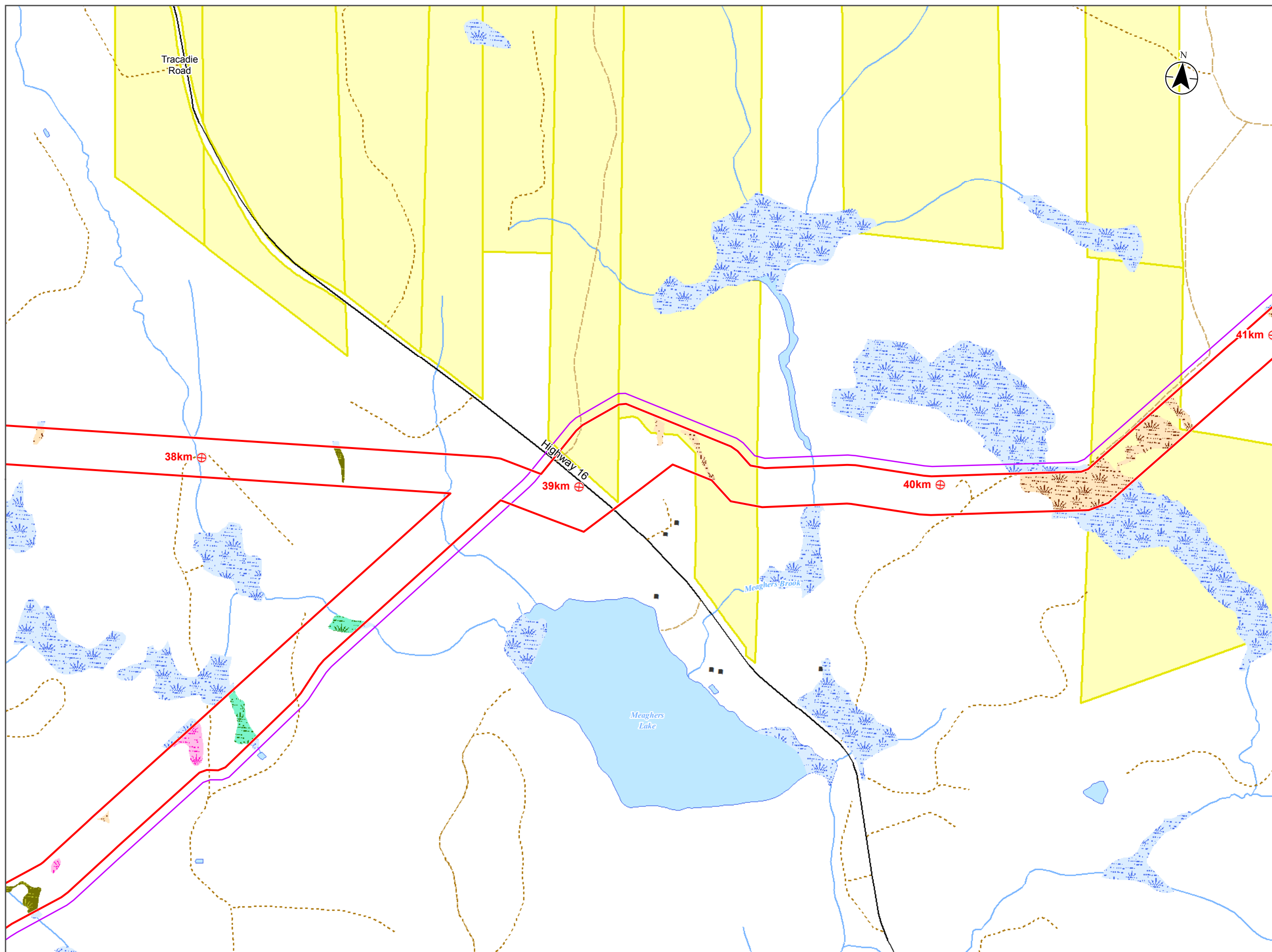
Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia. *ACCDC observations with accuracy ± 1 km shown on mapping. Results within the assessment corridor, on crown land, are derived from field surveys; all other results are based on desktop information.



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Wetlands and Plant Species of Conservation Interest



Study Features

Wetland (Class/Type)

- Shrub Swamp
- Treed Bog
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

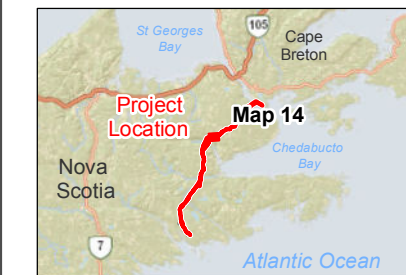
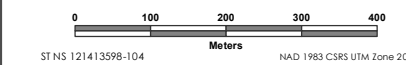
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Building/Structure
- Collector/Arterial Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

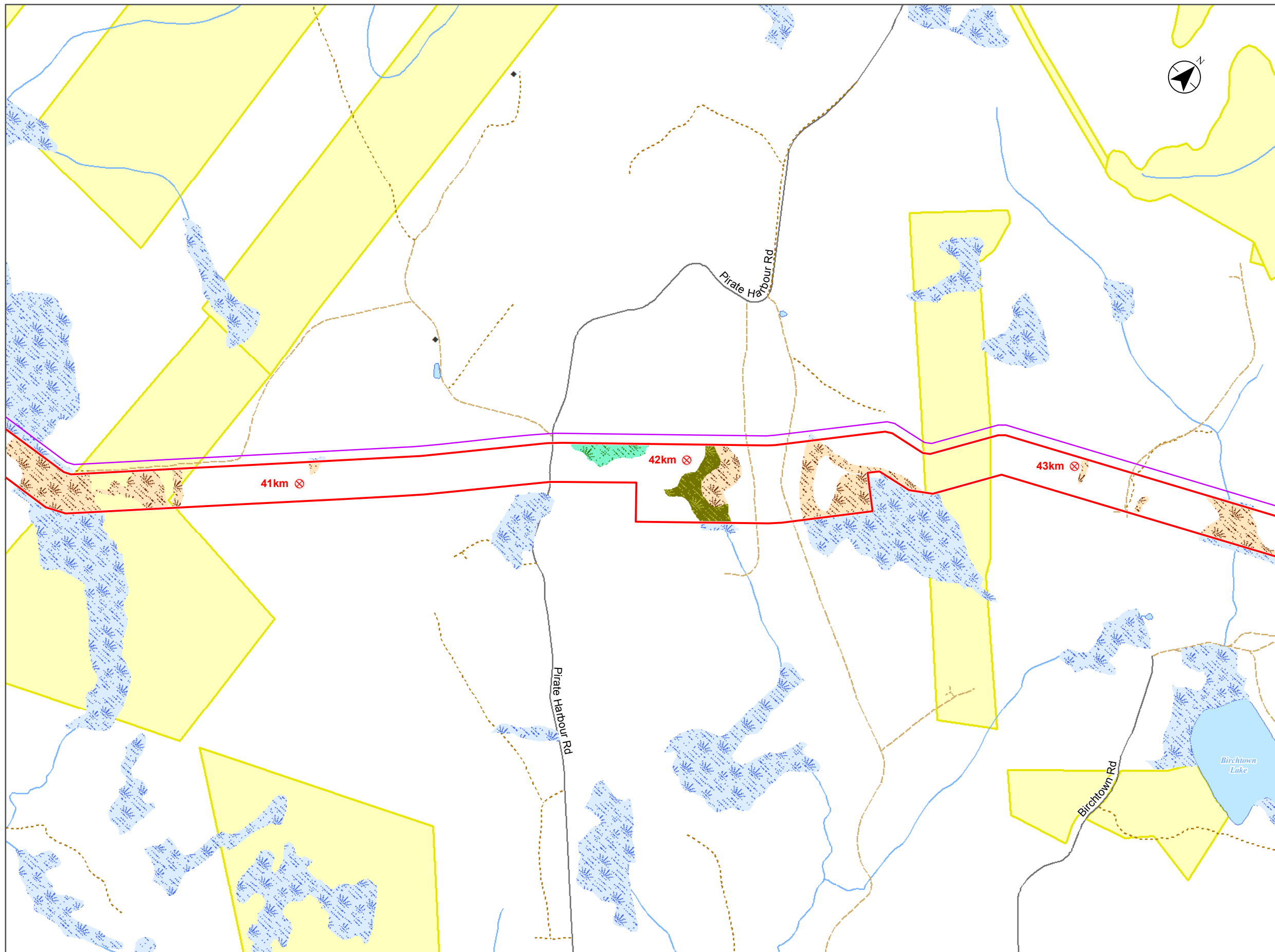
Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
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Wetlands and Plant Species of Conservation Interest






Study Features








Wetland (Class/Type)

-  Shrub Swamp
-  Mixedwood Treed Swamp
-  Softwood Treed Swamp
-  Wetland

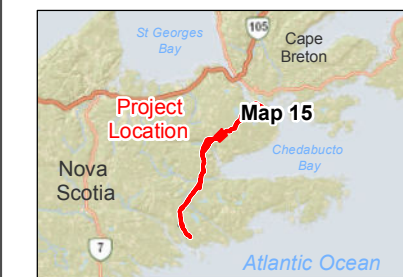
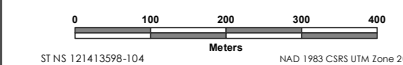
Project Components

-  Kilometre Post (Approximate Distance from Origin)
-  Assessment Corridor / Local Assessment Area (LAA)
-  Existing Pipeline Right of Way

Map Features

-  Building/Structure
-  Local Road
-  Seasonal Road
-  Track/Trail
-  Watercourse
-  Waterbody
-  Crown Land

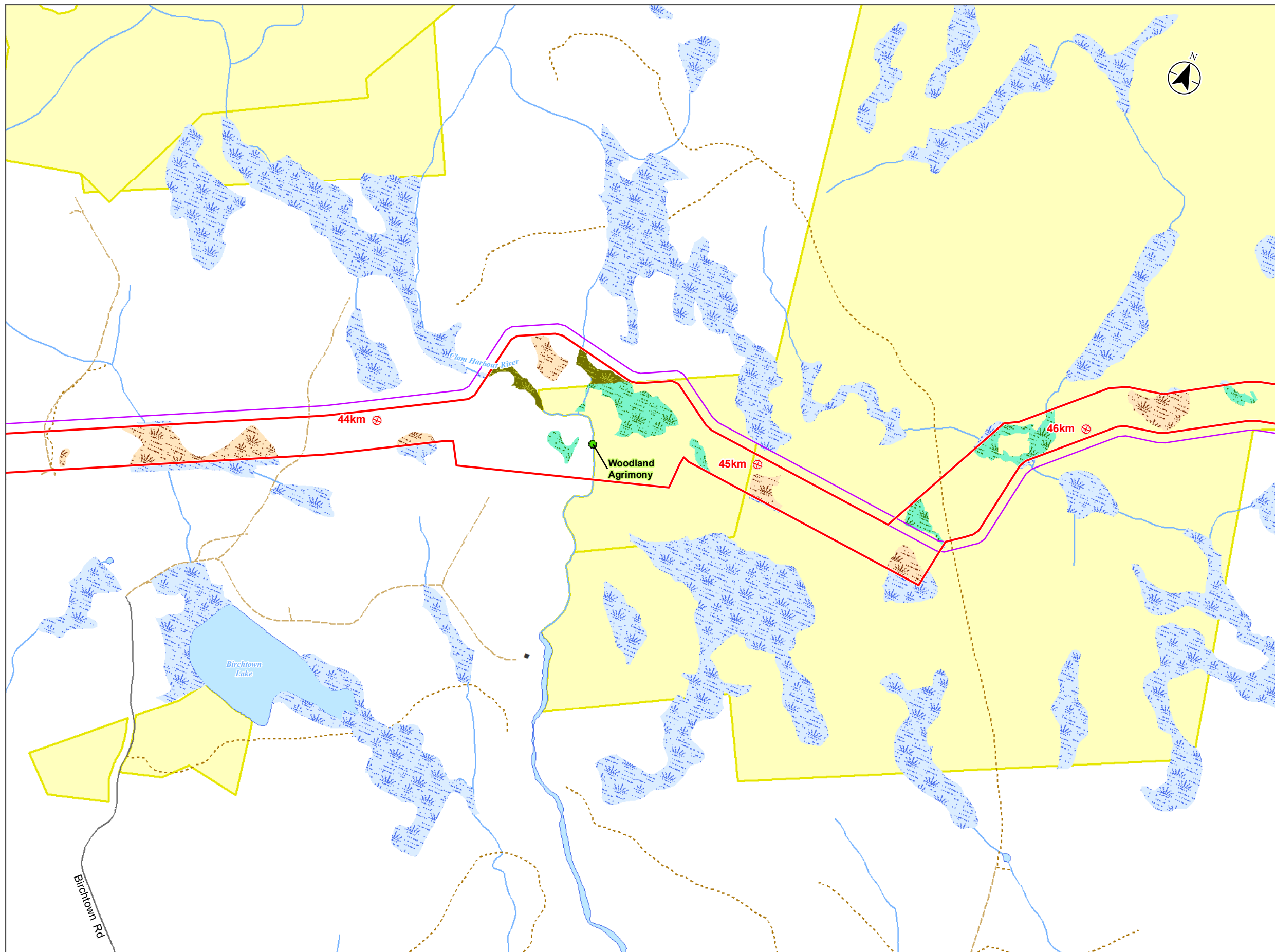
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Wetlands and Plant Species of Conservation Interest



Study Features

Species Observation - Field

- Vascular Plant

Wetland (Class/Type)

- Shrub Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

Project Components

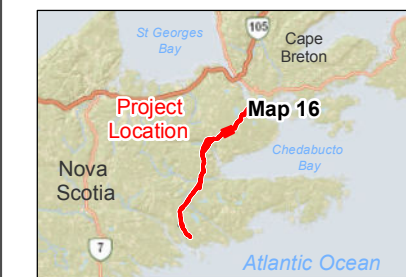
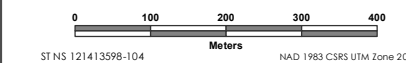
- Kilometre Post (Approximate Distance from Origin)

- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Building/Structure
- Local Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

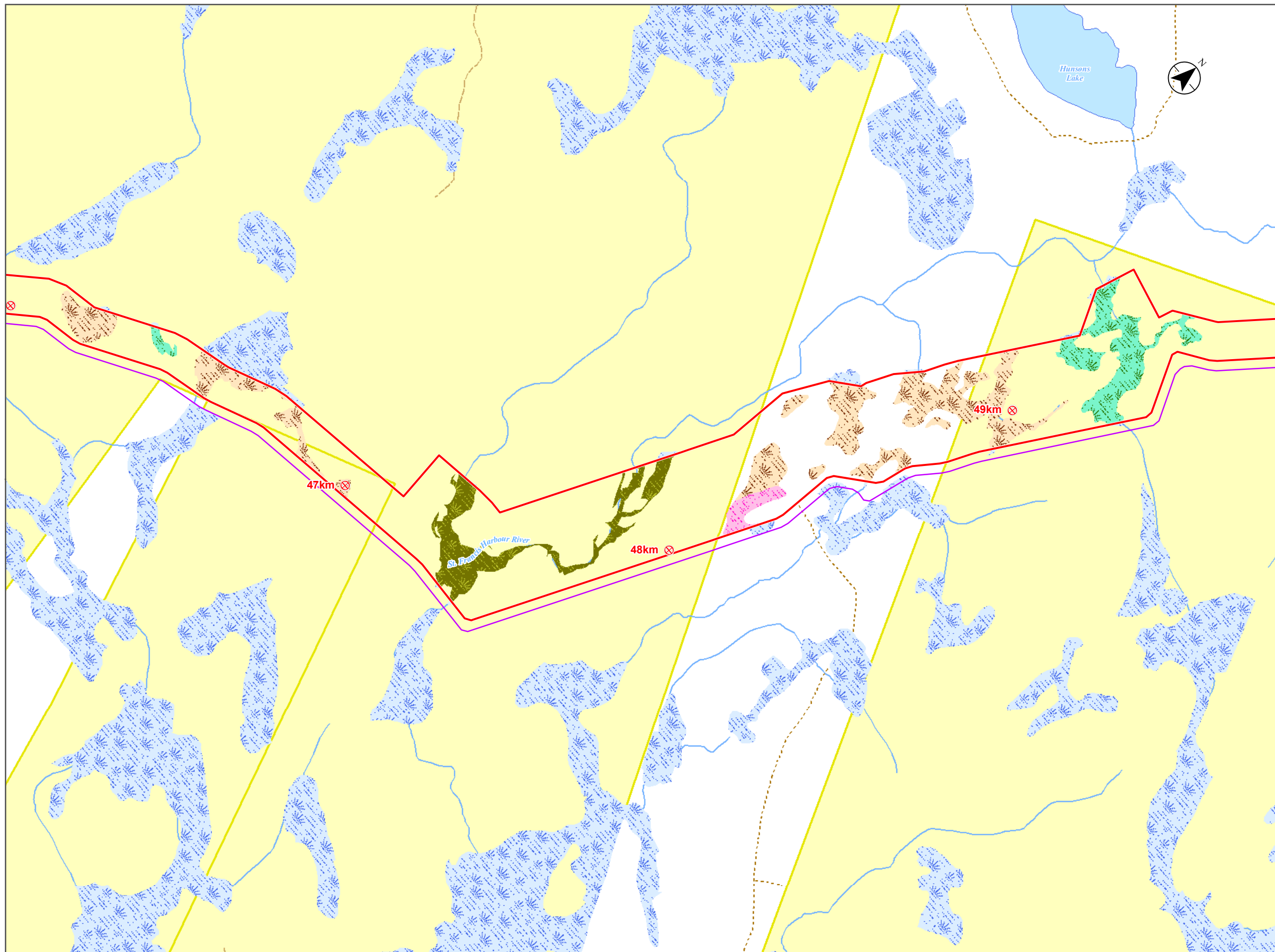
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Wetlands and Plant Species of Conservation Interest



Study Features

Wetland (Class/Type)

- Shrub Swamp
- Treed Bog
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

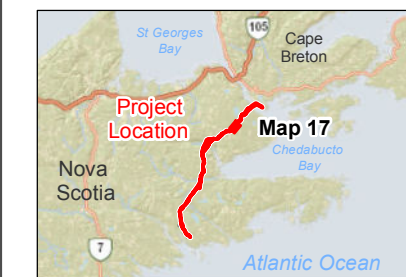
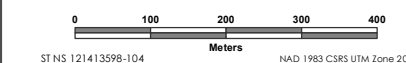
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

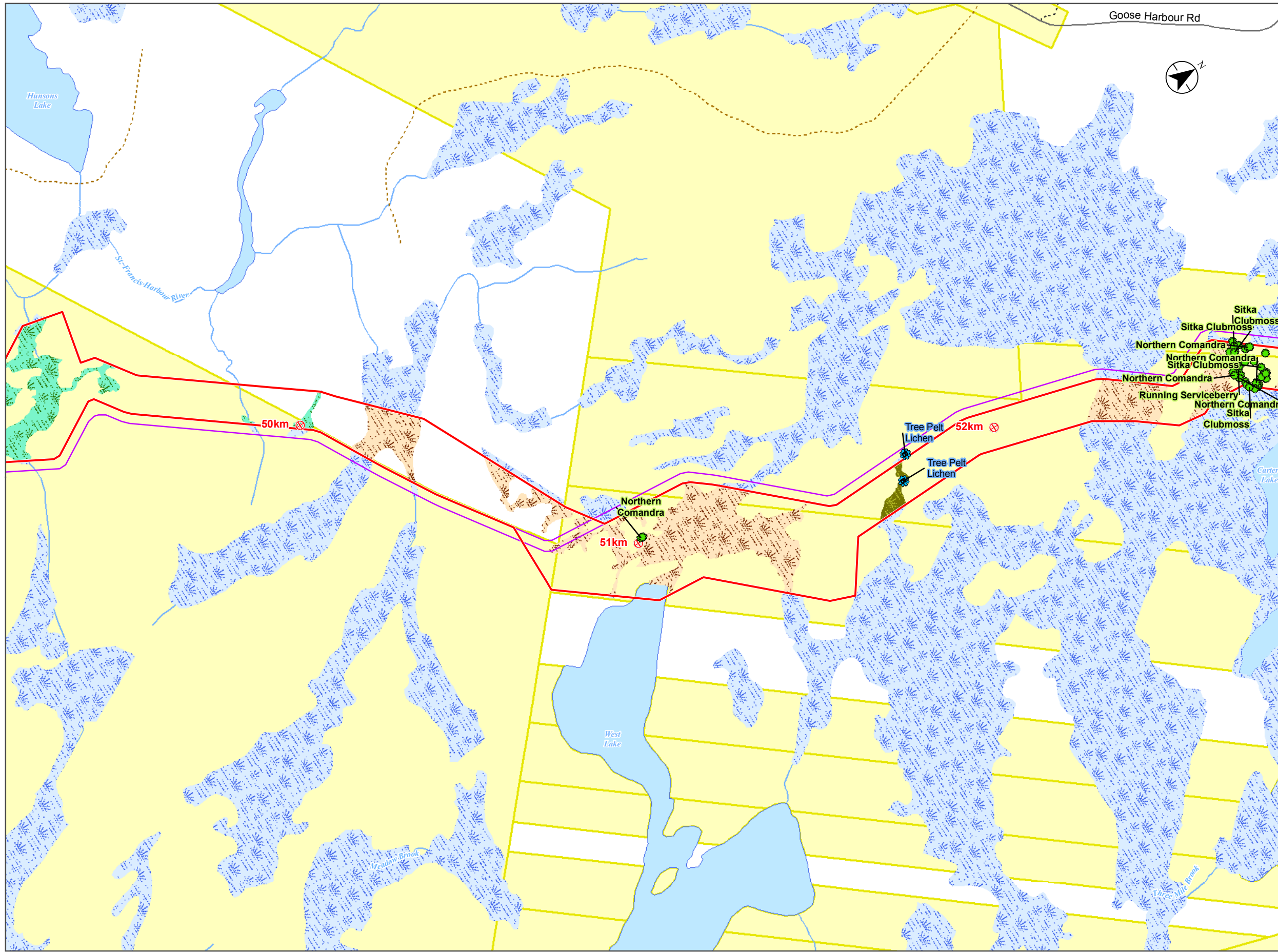
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
 *ACCDC observations with accuracy ± 1 km shown on mapping.
 Results within the assessment corridor, on crown land, are derived from field surveys; all other results are based on desktop information.



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Wetlands and Plant Species of Conservation Interest

Study Features

Species Observation - Field

- Vascular Plant
- Lichen

Wetland (Class/Type)

- Shrub Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

Project Components

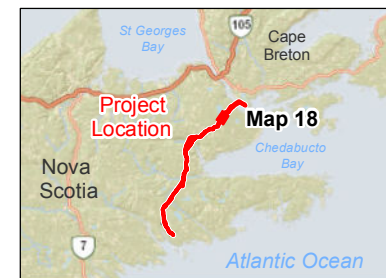
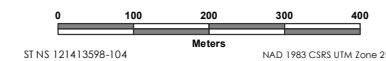
- ⊕ Kilometre Post (Approximate Distance from Origin)

- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Local Road
- Private/Restricted Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

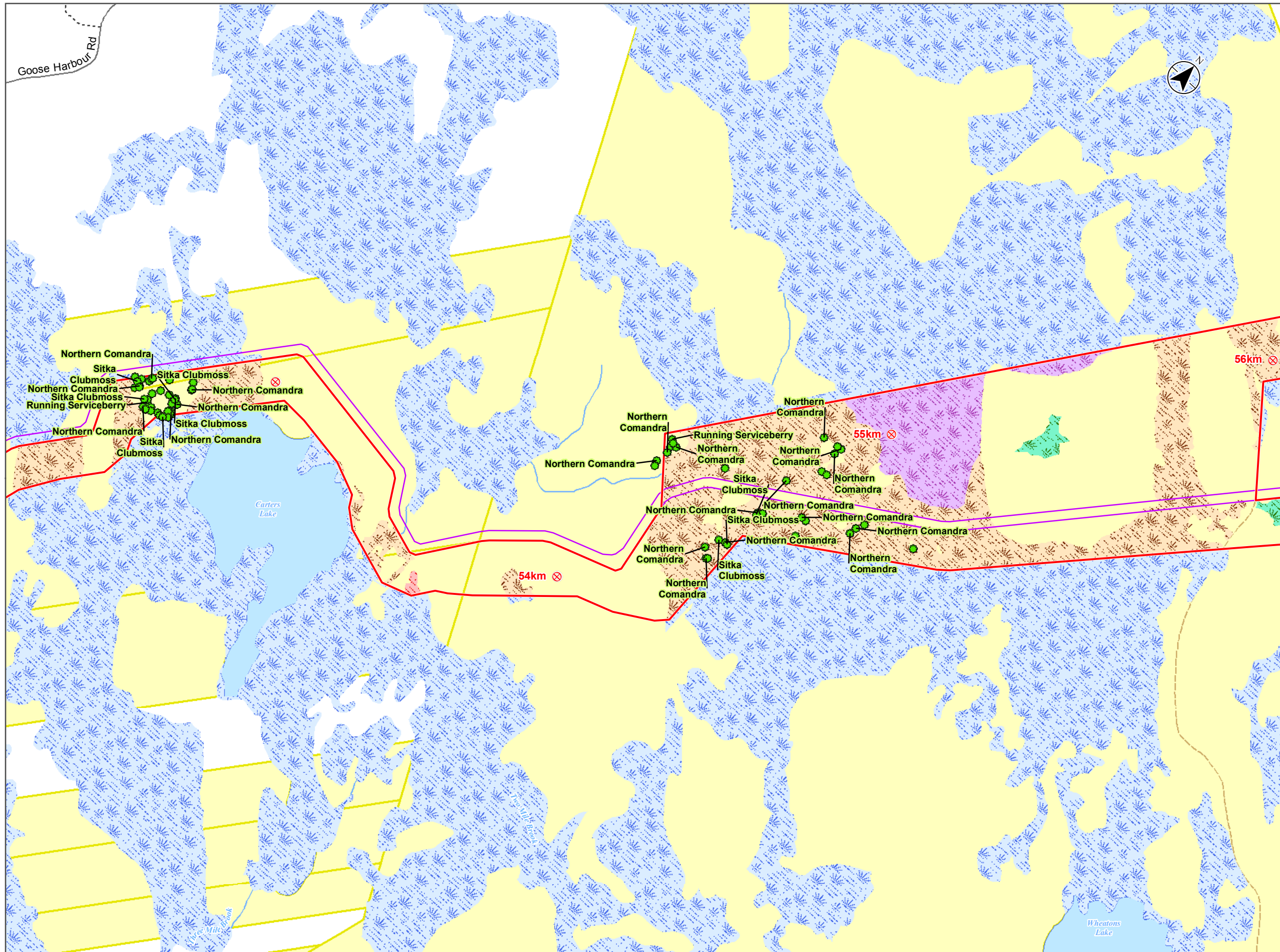
Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
 *ACCDC observations with accuracy ± 1 km shown on mapping. Results within the assessment corridor, on crown land, are derived from field surveys; all other results are based on desktop information.



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Wetlands and Plant Species of Conservation Interest



Study Features

Species Observation - Field

- Vascular Plant

Wetland (Class/Type)

- Bog
- Hardwood Treed Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

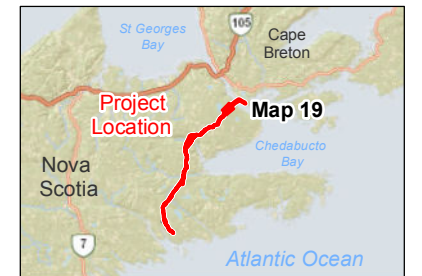
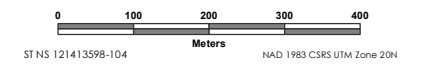
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)
- Existing Pipeline Right of Way

Map Features

- Local Road
- Private/Restricted Road
- Seasonal Road
- Watercourse
- Waterbody
- Crown Land

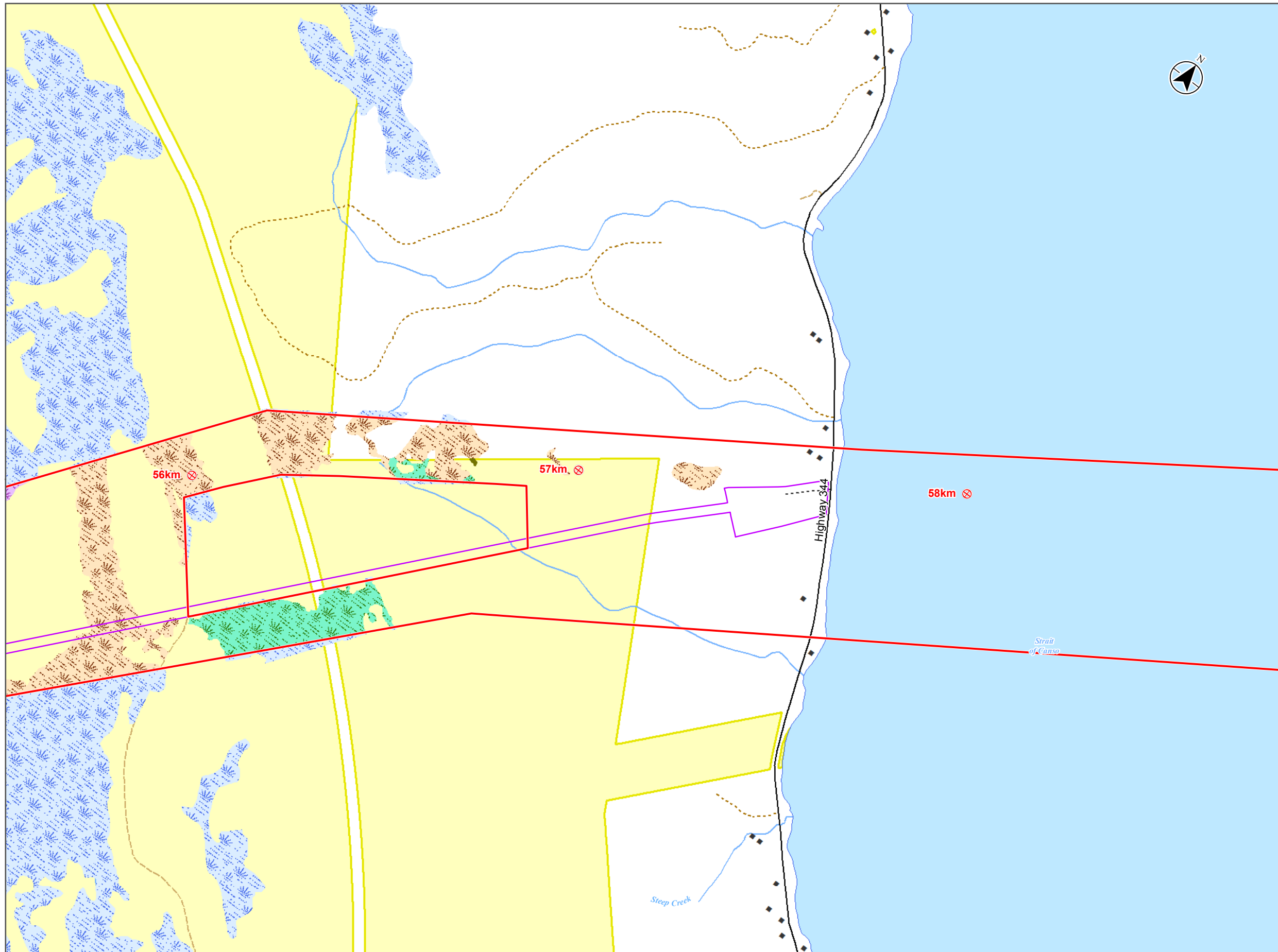
Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
 *ACCDC observations with accuracy ± 1 km shown on mapping.
 Results within the assessment corridor, on crown land, are derived from field surveys; all other results are based on desktop information.



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Wetlands and Plant Species of Conservation Interest



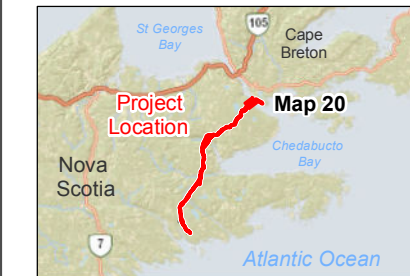
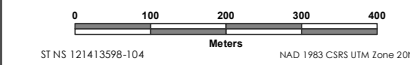
Study Features

- Wetland (Class/Type)**
- Bog
 - Shrub Swamp
 - Mixedwood Treed Swamp
 - Softwood Treed Swamp
 - Wetland

- Project Components**
- Kilometre Post (Approximate Distance from Origin)
 - Assessment Corridor / Local Assessment Area (LAA)
 - Existing Pipeline Right of Way

- Map Features**
- Building/Structure
 - Collector/Arterial Road
 - Private/Restricted Road
 - Seasonal Road
 - Track/Trail
 - Watercourse
 - Waterbody
 - Crown Land

Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
 *ACCDC observations with accuracy ± 1 km shown on mapping
 Results within the assessment corridor, on crown land, are derived from field surveys; all other results are based on desktop information.



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Wetlands and Plant Species of Conservation Interest



Study Features

Species Observation - Desktop

- Atlantic Canada Conservation Data Centre*

Wetland (Class/Type)

- Shrub Swamp
- Mixedwood Treed Swamp
- Softwood Treed Swamp
- Wetland

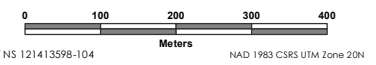
Project Components

- Kilometre Post (Approximate Distance from Origin)
- Assessment Corridor / Local Assessment Area (LAA)

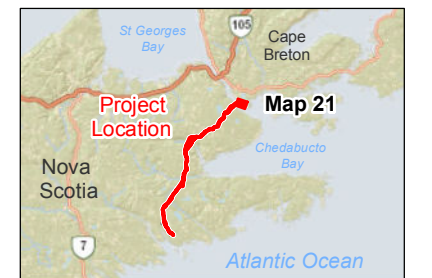
Map Features

- Building/Structure
- Local Road
- Private/Restricted Road
- Seasonal Road
- Track/Trail
- Watercourse
- Waterbody
- Crown Land

Sources: Data provided by Atlantic Canada Conservation Data Centre, the Government of Canada and Nova Scotia.
 *ACCDC observations with accuracy ± 1 km shown on mapping. Results within the assessment corridor, on crown land, are derived from field surveys; all other results are based on desktop information.



STNS 121413598-104 NAD 1983 CSRS UTM Zone 20N



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 BEAR PAW PIPELINE PROJECT



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APPENDIX E2

EXAMPLE FUNCTIONAL ASSESSMENT FORM



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Bear Head Project – Wetland Delineation and Characterization

Date:	Wetland number:
Surveyors:	Project number 121413598
Camera id:	Photos #'s: _____ Nomad # _____

Wetland Classification Info (follow CWCS)

Wetland Class		% area of wetland	
Form:	%	Form:	%
Type:	%	Type:	%
Wetland Class		% area of wetland	
Form:	%	Form:	%
Type:	%	Type:	%
Plant Community 1:		Plant Community 2*:	
Tree		Tree	
Shrub		Shrub	
Grnd		Grnd	

*Provide additional description of dominant plant communities below as required

Soils

Peat Present Y / N (greater than 20cm)	Maximum peat depth _____ cm
	Average peat depth _____ cm

Sketch of delineated wetland boundaries:

Significant Function (refer to NOVAwet for guidance)										
SF3	Rate the general wetland condition/integrity	H	M	L	Notes:					
SF4	Rate the overall condition and integrity land adjacent to wetland	H	M	L	Notes:					
SF5	Is the WL a WSS?	Yes	No							
SF6	Does the WL support commercial/recreational fish/shellfish?	Yes	No							
SF9	Wetland is calcerous fen, black ash or cedar swamp, wild rice marsh?	Yes	No							
SF11	WL within a floodplain and upstream of or within of a populated area?	Yes	No							
SF12	Fed/Prov/Municipal area of interest?	Yes	No	specify:						
SF13	WL hydrologic condition	Natural	Modified	Significantly Modified						
SF14	WL important for maintaining stream flow?	Yes	No							
SF15	WL ability to detain surface water	High	Med	Low						
SF16	Wetland improves water quality?	Yes	No							
SF17	Evidence of excess nutrient loading/contamination?	Low	Med	High						
SF18	WL contributes to water quality in downstream resources	High	Med	Low						
SF19	WL serves as a recharge site	Yes	No							
SF20	WL serves as a discharge site	Yes	No							
SF21	WL ability to stabilize shoreline	H	M	L	N/A					
SF22	Is the plant community unique or rare regionally or provincially?	Yes	no	specify:						
SF23	Does the WL contain a diversity of plant communities	H	M	L						
SF24	Rate the overall integrity/quality of plant community?	H	M	L						
SF25	Are there any observed rare plant species	End	Thr	SpC	Red	Yellow	S1	S2	S3	N/A
	Specify:									
SF26	Does wetland support fish/fish habitat?	Yes	No	specify:						
SF7/SF27	Rare or endangered fish/wildlife species?	End	Thr	SpC	Red	Yellow	S1	S2	S3	N/A
	Specify (including potential for bird SAR):									
SF28	Overall fish and wildlife habitat quality	H	M	L						
SF29	Rate the wetland's community use/value	H	M	L						

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APPENDIX E3 DESCRIPTIONS OF FEC TYPES OBSERVED WITHIN THE LAA



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E.1 INTOLERANT HARDWOOD FOREST GROUP

E.1.1 White birch-Red maple/Sarsaparilla-Bracken (IH6)

The IH6 vegetation type is generally found on well-drained sites with intermediate fertility. In the IH6 stand sampled in the LAA, the tree layer is composed entirely of red maple. The shrub understory is relatively sparse and is composed largely of northern wild raisin (*Viburnum nudum*) with lesser amounts of velvet-leaved blueberry (*Vaccinium myrtilloides*) and American mountain ash (*Sorbus americana*). Evergreen wood fern (*Dryopteris intermedia*) and wild sarsaparilla (*Aralia nudicaulis*) are the most abundant ground vegetation species. Other common ground vegetation species include hair-cap mosses (*Polytrichum* spp.), wild lily-of-the-valley (*Maianthemum canadense*), and bracken fern (*Pteridium aquilinum*).

E.1.2 Red maple/Hay-scented fern-Wood sorrel (IH7)

The IH7 vegetation type is generally found on sites with similar fertility regimes as IH6 but with higher moisture levels. The tree canopy of this vegetation type is also dominated entirely by red maple; however, the shrub understory is composed of a mixture of regenerating red maple and balsam fir. The ground vegetation layer supports a dense cover of ferns composed largely of spinulose wood fern (*Dryopteris carthusiana*), evergreen wood fern, eastern hay-scented fern (*Dennstaedtia punctilobula*), and New York fern (*Thelypteris noveboracensis*). Other common ground vegetation species include bunchberry (*Cornus canadensis*) and wild lily-of-the-valley.

E.2 TOLERANT HARDWOOD FOREST GROUP

E.2.1 Sugar maple/Hay-scented fern (TH1)

In the LAA, the TH1 vegetation type was found in the area between Beech Hill and Salmon River. These stands were associated with hill tops and upper slopes. The tree canopy is composed mainly of sugar maple with some yellow birch. The shrub layer is composed mostly of stunted American beech along with some saplings of sugar maple. The ground vegetation layer is dominated by a mixture of evergreen wood fern and spinulose wood fern. The Beech variant of this vegetation type (TH1a) differs from TH1 in that it has a greater abundance of yellow birch and American beech in the tree canopy.

E.2.2 Sugar maple/New York fern-Northern beech fern (TH2)

The TH2 vegetation type was recorded only on top of a large drumlin adjacent to Carters Lake. The canopy of the vegetation type consists of a mixture of sugar maple, red maple and yellow birch with scattered white spruce. The shrub understory is relatively sparse and consists mainly of regenerating yellow birch, balsam fir, sugar maple and red spruce. The ground vegetation layer is composed almost entirely of ferns, the most abundant of which are New York fern, evergreen wood fern, hay-scented fern and spinulose wood fern.

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E.2.3 Red maple-Yellow birch/Striped maple (TH8)

The TH8 vegetation type is the most widespread Tolerant Hardwood vegetation type in the LAA with stands present on hilltops from Beech Hill to Carters Lake. The tree canopy of these stands is composed largely of yellow birch and red maple with scattered balsam fir and white spruce. The shrub understory varies from relatively open to dense and is composed mainly of regenerating balsam fir and red maple. In some stands, small numbers of sugar maple are also present in the understory. The ground vegetation layer consists of a patchy fern cover composed mainly of New York fern and evergreen wood fern, as well as common forest forbs such as bunchberry, wild lily-of-the-valley and wild sarsaparilla.

E.3 MIXEDWOOD FOREST GROUP

In the LAA, the Mixedwood Forest Group is represented by two vegetation types: Red spruce-Red maple-White birch/Goldthread (MW2) and Balsam fir-Red maple/Wood sorrel-Goldthread (MW4). These vegetation types occur on a variety of moisture conditions ranging from well-drained to poorly-drained. Both of these vegetation types are generally found on infertile sites.

E.3.1 Red spruce-Red maple-White birch/Goldthread (MW2)

The MW2 vegetation type is found on well-drained infertile sites. The tree canopy contains a mixture of red spruce, red maple and yellow birch. The shrub understory is composed mostly of a dense cover of regenerating balsam fir along with scattered red maple saplings. The ground vegetation layer is characterized by a patchy bryophyte carpet dominated by a mixture of species, the most abundant of which are stairstep moss and three-lobed whipwort (*Bazzania trilobata*).

E.3.2 Balsam fir-Red maple/Wood sorrel-Goldthread (MW4)

The MW4 vegetation type is also found on infertile sites but typically occurs in poorly-drained areas. The examples found in the LAA were young stands that had established following clear-cutting. Most tree cover consists of regenerating tree species, the most abundant of which are balsam fir, red maple and yellow birch. Some remnant mature trees are also present in the canopy. Shrub species are not common and the species most frequently encountered include red raspberry (*Rubus idaeus*), sheep laurel and late lowbush blueberry (*Vaccinium angustifolium*). The ground vegetation species composition is highly variable between stands with moss species more common in stands with higher amounts of conifers in the canopy and herbs more common in stands with higher amounts of deciduous trees in the canopy. Ground vegetation species commonly encountered in the MW4 vegetation type include stairstep moss, three-lobed whipwort, red-stemmed feather moss (*Pleurozium schreberi*), sphagnum moss (*Sphagnum* spp.), New York fern and bracken fern.

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E.4 SPRUCE-HEMLOCK FOREST GROUP

E.4.1 Red spruce-Balsam fir/Stair-step moss-Sphagnum moss (SH6)

This SH6 vegetation type is typically found on mesic sites such as the lower slopes of hills. The tree layer is composed largely of a mixture of balsam fir and red spruce as well as a few scattered white pine. The shrub layer is sparse and is composed almost entirely of balsam fir regeneration. The ground vegetation layer consists largely of a bryophyte carpet composed mainly of stairstep moss and three-lobed whipwort with patches of sphagnum moss occurring in small depressions.

E.4.2 Balsam fir/Wood fern/Schreber's moss (SH8)

This vegetation type is often encountered near the landward margins of wetlands where groundwater is located near the surface. The tree canopy is dominated by balsam fir. Small numbers of other tree species may be present. The shrub layer consists mainly of balsam fir regeneration which is often quite dense. The dense bryophyte carpet on the forest floor is dominated by a mixture of Red-stemmed feather moss, stairstep moss (*Hylocomium splendens*) and three-lobed whipwort.

E.5 SPRUCE-PINE FOREST GROUP

E.5.1 Black spruce/Lambkill/Bracken (SP5)

The SP5 vegetation type is typically found on dry sites. It is associated with thin soils and often occurs in areas of bedrock outcropping or very stony soils. It is most frequently encountered in the southern half of the LAA that is located within the Eastern Interior Ecoregion. The tree overstory is relatively open and composed mainly of black spruce with lesser amounts of tamarack (*Larix laricina*) and red maple. The shrub understory is moderately dense and composed mainly of black spruce regeneration along with lesser amounts of mountain holly (*Nemopanthus mucronatus*), sheep laurel (*Kalmia angustifolia*), balsam fir regeneration and northern wild raisin. The ground vegetation layer consists of a patchy moss carpet composed largely of red-stemmed feather moss and broom mosses (*Dicranum* spp.). The forest floor between moss patches is occupied by bunchberry and bracken fern.

E.5.2 Black spruce-Red maple/Bracken-Sarsaparilla (SP6)

The SP6 vegetation type is found on moister sites than the SP5 vegetation type. The tree layer consists of a mixture of red maple and black spruce along with small amounts of balsam fir. The shrub understory is very dense and consists mainly of northern wild raisin and mountain holly along with small amounts of sheep laurel and balsam fir regeneration. On the forest floor, moss cover is relatively sparse and consists largely of broom mosses and red-stemmed feather moss. Bunchberry is the most abundant ground vegetation species. Other common species of the

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ground vegetation layer include wild sarsaparilla, northern starflower (*Trientalis borealis*), and bracken fern.

E.5.3 Black spruce/False Holly/Ladies'-tresses sphagnum (SP7)

This vegetation type is typically found on imperfectly-drained to poorly-drained sites. All of the SP7 stands sampled during the field surveys were sufficiently poorly-drained to be classified as wetlands. The ground vegetation layer in the sampled stands consists of a continuous sphagnum moss carpet that is punctuated by patches of vascular plants, the most abundant of which are three-seeded sedge (*Carex trisperma*) and cinnamon fern (*Osmunda cinnamomea*). The tree canopy is relatively open and is composed of a mixture of black spruce, red maple and tamarack. The shrub layer is moderately dense and consists of a mixture of black spruce regeneration, sheep laurel, northern wild raisin, speckled alder, mountain holly and common winterberry (*Ilex verticillata*).

E.6 COASTAL FOREST GROUP

E.6.1 Black spruce-Balsam fir/Foxberry/Plume moss (CO1)

The CO1 vegetation type is associated with infertile sites with hydrological conditions ranging from moderately well-drained to imperfectly-drained. Balsam fir, black spruce and red maple are the most abundant species of the tree canopy. The shrub understory is moderately dense and is composed largely of balsam fir and black spruce regeneration along with some mountain holly. Mosses dominate the ground vegetation layer forming a nearly continuous carpet composed largely of red-stemmed feather moss, staircase moss, sphagnum moss, broom mosses and knight's plume moss (*Ptilium crista-castrensis*). Common herb species include bunchberry, northern starflower and cinnamon fern.

E.7 OLD FIELD FOREST GROUP

E.7.1 White spruce/Aster-Goldenrod/Shaggy moss (OF1)

The OF1 vegetation type is typically found on well-drained, relatively infertile sites. Abandoned agricultural land is uncommon within the LAA due to the infertile soils that occupy most of its extent. In some areas, particularly along the central portion of the LAA, some small-scale farming was undertaken in the past. Cleared areas are usually situated on the tops of drumlins or in river valleys where soils are less stony and more fertile. The OF1 vegetation type sampled during the field surveys was characterized by a dense tree canopy composed of a mixture of white spruce and tamarack. The shrub and ground vegetation layers are quite sparse due to the heavy shading. The shrub layer consists of scattered northern wild raisin, mountain holly, common winterberry and white meadowsweet (*Spiraea alba*). The ground vegetation layer consists of a patchy moss carpet composed mainly of electrified cat's-tail moss (*Rhytidiadelphus triquetris*), red-stemmed feather moss, three-lobed whipwort and hair-cap mosses.

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E.8 OPEN WOODLAND GROUP

E.8.1 Black spruce/Lambkill/Reindeer moss (OW2)

The OW2 vegetation type occurs at various locations along the proposed pipeline route and is typically associated with areas of bedrock outcropping. The tree canopy is very sparse and is composed of scattered patches of black spruce and tamarack. Patches of stunted black spruce are also an important component of the shrub layer. The black spruce tends to occur in low lying areas with better soil development and available moisture. Areas with thinner soil are occupied by a dense mixture of shrubs including northern wild raisin, rhodora (*Rhododendron canadense*), sheep laurel and mountain holly. Areas with virtually no soil development are occupied by a carpet of reindeer lichens. Other common ground vegetation species include bunchberry, creeping snowberry (*Gaultheria hispidula*), sphagnum moss and stiff clubmoss (*Lycopodium annotinum*).

E.9 WET CONIFEROUS FOREST GROUP

E.9.1 Black spruce/Cinnamon fern/Sphagnum (WC1)

The WC1 vegetation type has an open tree canopy composed of a mixture of black spruce, balsam fir and red maple. The shrub understory is moderately dense and consists mostly of regenerating black spruce and balsam fir along with lesser amounts of mountain holly, sheep laurel and northern wild raisin. The sphagnum moss carpet is punctuated by patches of cinnamon fern and New York fern, as well as some bunchberry and three-seeded sedge.

E.9.2 Black spruce/Lambkill-Labrador tea/Sphagnum (WC2)

The tree canopy of the WC2 vegetation type is mostly composed of black spruce and balsam fir along with small amounts of tamarack and red maple. Black spruce is the most abundant species in the shrub understory. Other common species of the shrub layer include mountain holly, sheep laurel, balsam fir regeneration and northern wild raisin. Sphagnum moss and some red-stemmed feather moss form the moss carpet of the ground vegetation layer. Other common ground vegetation species include bunchberry, cinnamon fern and three-seeded sedge.

E.9.3 Balsam fir/Cinnamon fern-Three seeded sedge/Sphagnum (WC6)

The WC6 vegetation type occurs on somewhat more fertile sites than either WC1 or WC2. The open tree canopy consists of a mixture of balsam fir and black spruce. The shrub layer is relatively sparse. Common species of the shrub layer include balsam fir and red maple regeneration as well as mountain holly, sheep laurel and speckled alder (*Alnus incana*). In the ground vegetation layer, the sphagnum moss carpet is punctuated by small patches of cinnamon fern, New York fern, bracken fern and bunchberry.

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E.9.4 Tamarack-Black spruce/Lambkill/Sphagnum (WC7)

The WC7 vegetation type typically has an open tree canopy, a dense shrub understory and a nearly continuous sphagnum moss carpet. The tree canopy is composed of a mixture of tamarack, red maple and black spruce. The dense shrub layer is composed largely of northern wild raisin, black spruce regeneration, sheep laurel, mountain holly and speckled alder. In addition to sphagnum moss, the most abundant ground vegetation species include three-seeded sedge, cinnamon fern and bunchberry.

E.10 WET DECIDUOUS FOREST GROUP

E.10.1 Red maple/Cinnamon fern/Sphagnum (WD2)

The WD2 vegetation type is characterized by a red maple dominated tree overstory with a moderately dense shrub understory, composed largely of a mixture of northern wild raisin, speckled alder, red maple regeneration, mountain holly and black spruce regeneration. The species composition of the ground vegetation layer is highly variable between individual sites. The most abundant species of the ground vegetation layer include sphagnum moss, cinnamon fern and northern manna grass (*Glyceria laxa*).

E.10.2 Red maple-Balsam fir/Wood aster/Sphagnum moss (WD6)

The tree overstory of the WD6 vegetation type is composed largely of red maple and balsam fir along with small amounts of black spruce and heart-leaved birch. The shrub understory consists mainly of regenerating balsam fir along with some speckled alder. The species composition of the ground vegetation layer varies substantially between sites. Species that are characteristic of this vegetation type include sphagnum moss, cinnamon fern and three-seeded sedge.

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APPENDIX E4 VASCULAR PLANT LIST



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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Abies balsamea</i>	balsam fir	S5	secure
<i>Acer pensylvanicum</i>	striped maple	S5	secure
<i>Acer rubrum</i>	red maple	S5	secure
<i>Acer saccharum</i>	sugar maple	S5	secure
<i>Acer spicatum</i>	mountain maple	S5	secure
<i>Actaea rubra</i>	red baneberry	S5	secure
<i>Agalinis neoscotica</i>	Nova Scotia agalinis	S3	secure
<i>Agrimonia gryposepala</i>	woodland agrimony	S3	secure
<i>Agrostis gigantea</i>	redtop	SNA	exotic
<i>Agrostis perennans</i>	upland bent grass	S4S5	secure
<i>Agrostis stolonifera</i>	creeping bent grass	S5	secure
<i>Alnus incana</i>	speckled alder	S5	secure
<i>Amelanchier</i> sp.	a serviceberry		
<i>Amelanchier stolonifera</i>	running serviceberry	S3?	secure
<i>Amelanchier x intermedia</i>	running serviceberry	SNA	not assessed
<i>Anaphalis margaritacea</i>	pearly everlasting	S5	secure
<i>Andromeda polifolia</i>	bog rosemary	S5	secure
<i>Apocynum androsaemifolium</i>	spreading dogbane	S5	secure
<i>Apocynum cannabinum</i>	Indian hemp	S4	secure
<i>Aquilegia vulgaris</i>	European columbine	SNA	exotic
<i>Aralia hispida</i>	bristly sarsaparilla	S5	secure
<i>Aralia nudicaulis</i>	wild sarsaparilla	S5	secure
<i>Arethusa bulbosa</i>	arethusa	S4	secure
<i>Athyrium filix-femina</i>	common lady fern	S5	secure
<i>Bartonia paniculata</i>	branched bartonia	S4S5	secure
<i>Betula alleghaniensis</i>	yellow birch	S5	secure
<i>Betula michauxii</i>	Newfoundland dwarf birch	S2	sensitive
<i>Betula papyrifera</i>	paper birch	S5	secure
<i>Betula papyrifera</i> var. <i>cordifolia</i>	heart-leaved birch	S5	secure
<i>Betula populifolia</i>	gray birch	S5	secure
<i>Bidens cernua</i>	nodding beggarticks	S5	secure
<i>Botrychium multifidum</i>	leathery moonwort	S4	secure

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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Brachyelytrum septentrionale</i>	northern shorthusk	S5	secure
<i>Bromus ciliatus</i>	fringed brome	S5	secure
<i>Bromus inermis</i>	smooth brome	SNA	exotic
<i>Calamagrostis canadensis</i>	bluejoint reed grass	S5	secure
<i>Calamagrostis pickeringii</i>	Pickering's reed grass	S4S5	secure
<i>Calla palustris</i>	wild calla	S4	secure
<i>Callitriche palustris</i>	marsh water-starwort	S5	secure
<i>Cardamine pensylvanica</i>	Pennsylvania bittercress	S5	secure
<i>Carex arctata</i>	drooping woodland sedge	S5	secure
<i>Carex atlantica</i>	Atlantic sedge	S4	secure
<i>Carex atlantica ssp. atlantica</i>	Atlantic sedge	S4	secure
<i>Carex brunnescens</i>	brownish sedge	S5	secure
<i>Carex canescens</i>	silvery sedge	S5	secure
<i>Carex communis</i>	fibrous-root sedge	S5	secure
<i>Carex crinita</i>	fringed sedge	S5	secure
<i>Carex debilis</i>	white-edged sedge	S5	secure
<i>Carex deweyana</i>	Dewey's sedge	S5	secure
<i>Carex echinata</i>	star sedge	S5	secure
<i>Carex exilis</i>	coastal sedge	S4	secure
<i>Carex flava</i>	yellow sedge	S5	secure
<i>Carex folliculata</i>	northern long sedge	S5	secure
<i>Carex gracillima</i>	graceful sedge	S4S5	secure
<i>Carex gynandra</i>	nodding sedge	S5	secure
<i>Carex intumescens</i>	bladder sedge	S5	secure
<i>Carex lasiocarpa</i>	slender sedge	S5	secure
<i>Carex lenticularis</i>	lenticular sedge	S4	secure
<i>Carex leptalea</i>	bristly-stalked sedge	S5	secure
<i>Carex leptonevia</i>	finely-nerved sedge	S5	secure
<i>Carex lurida</i>	sallow sedge	S5	secure
<i>Carex magellanica</i>	boreal bog sedge	S5	secure
<i>Carex michauxiana</i>	Michaux's sedge	S4	secure
<i>Carex nigra</i>	smooth black sedge	S5	secure

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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Carex novae-angliae</i>	New England sedge	S5	secure
<i>Carex oligosperma</i>	few-seeded sedge	S5	secure
<i>Carex pauciflora</i>	few-flowered sedge	S4S5	secure
<i>Carex projecta</i>	necklace sedge	S5	secure
<i>Carex pseudocyperus</i>	cyperuslike sedge	S4S5	secure
<i>Carex scoparia</i>	broom sedge	S5	secure
<i>Carex stipata</i>	awl-fruited sedge	S5	secure
<i>Carex stricta</i>	tussock sedge	S5	secure
<i>Carex torta</i>	twisted sedge	S5	secure
<i>Carex trisperma</i>	three-seeded sedge	S5	secure
<i>Centaurea nigra</i>	black knapweed	SNA	exotic
<i>Chamaedaphne calyculata</i>	leatherleaf	S5	secure
<i>Chamerion angustifolium</i>	fireweed	S5	secure
<i>Chelone glabra</i>	white turtlehead	S5	secure
<i>Chrysosplenium americanum</i>	American golden saxifrage	S5	secure
<i>Cicuta bulbifera</i>	bulbous water-hemlock	S5	secure
<i>Cinna latifolia</i>	drooping wood reed grass	S5	secure
<i>Circaea alpina</i>	small enchanter's nightshade	S5	secure
<i>Circaea x intermedia</i>	intermediate enchanter's nightshade	SNA	not assessed
<i>Clematis virginiana</i>	Virginia clematis	S5	secure
<i>Clintonia borealis</i>	yellow bluebead lily	S5	secure
<i>Coptis trifolia</i>	goldthread	S5	secure
<i>Cornus alternifolia</i>	alternate-leaved dogwood	S5	secure
<i>Cornus canadensis</i>	bunchberry	S5	secure
<i>Cornus sericea</i>	red osier dogwood	S5	secure
<i>Corylus cornuta</i>	beaked hazel	S5	secure
<i>Crataegus sp.</i>	a hawthorn		
<i>Cypripedium acaule</i>	pink lady's-slipper	S5	secure
<i>Danthonia compressa</i>	flattened oat grass	S5	secure
<i>Danthonia spicata</i>	poverty oat grass	S5	secure
<i>Daucus carota</i>	Queen Anne's lace	SNA	exotic

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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Dennstaedtia punctilobula</i>	eastern hay-scented fern	S5	secure
<i>Deparia acrostichoides</i>	silvery glade fern	S4	secure
<i>Dichanthelium acuminatum</i>	woolly panic grass	S5	secure
<i>Dichanthelium boreale</i>	northern panic grass	S5	secure
<i>Diervilla lonicera</i>	northern bush honeysuckle	S5	secure
<i>Doellingeria umbellata</i>	hairy flat-top white aster	S5	secure
<i>Drosera intermedia</i>	spoon-leaved sundew	S5	secure
<i>Drosera rotundifolia</i>	round-leaved sundew	S5	secure
<i>Dryopteris campyloptera</i>	mountain wood fern	S5	secure
<i>Dryopteris carthusiana</i>	spinulose wood fern	S5	secure
<i>Dryopteris cristata</i>	crested wood fern	S5	secure
<i>Dryopteris intermedia</i>	evergreen wood fern	S5	secure
<i>Dryopteris x boottii</i>	a hybrid wood-fern	SNA	not assessed
<i>Dryopteris x triploidea</i>	a hybrid wood-fern	SNA	not assessed
<i>Dulichium arundinaceum</i>	three-way sedge	S5	secure
<i>Eleocharis obtusa</i>	blunt spikerush	S5	secure
<i>Eleocharis palustris</i>	common spikerush	S5	secure
<i>Empetrum nigrum</i>	black crowberry	S5	secure
<i>Epigaea repens</i>	trailing arbutus	S5	secure
<i>Epilobium ciliatum</i>	northern willowherb	S5	secure
<i>Epilobium leptophyllum</i>	bog willowherb	S5	secure
<i>Epilobium palustre</i>	marsh willowherb	S5	secure
<i>Equisetum fluviatile</i>	water horsetail	S5	secure
<i>Equisetum sylvaticum</i>	woodland horsetail	S5	secure
<i>Eriocaulon aquaticum</i>	white buttons	S5	secure
<i>Eriophorum tenellum</i>	rough cottongrass	S4S5	secure
<i>Eriophorum vaginatum</i>	tussock cottongrass	S5	secure
<i>Eriophorum virginicum</i>	tawny cottongrass	S5	secure
<i>Eriophorum viridicarinatum</i>	green-keeled cottongrass	S4	secure
<i>Eupatorium maculatum</i>	spotted Joe-pye-weed	S5	secure
<i>Eupatorium perfoliatum</i>	common boneset	S5	secure
<i>Euphrasia stricta</i>	stiff eyebright	SNA	exotic

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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Eurybia radula</i>	low rough aster	S5	secure
<i>Euthamia graminifolia</i>	grass-leaved goldenrod	S5	secure
<i>Fagus grandifolia</i>	American beech	S5	secure
<i>Festuca rubra</i>	red fescue	S5	secure
<i>Filipendula ulmaria</i>	queen-of-the-meadow	SNA	exotic
<i>Fragaria virginiana</i>	wild strawberry	S5	secure
<i>Fraxinus americana</i>	white ash	S5	secure
<i>Galium palustre</i>	common marsh bedstraw	S5	secure
<i>Galium trifidum</i>	three-petaled bedstraw	S5	secure
<i>Galium triflorum</i>	three-flowered bedstraw	S5	secure
<i>Gaultheria hispidula</i>	creeping snowberry	S5	secure
<i>Gaultheria procumbens</i>	eastern teaberry	S5	secure
<i>Gaylussacia baccata</i>	black huckleberry	S5	secure
<i>Gaylussacia bigeloviana</i>	Bigelow's huckleberry	S5	secure
<i>Geocaulon lividum</i>	northern comandra	S3	secure
<i>Geum rivale</i>	water avens	S5	secure
<i>Glyceria borealis</i>	northern manna grass	S5	secure
<i>Glyceria canadensis</i>	Canada manna grass	S5	secure
<i>Glyceria grandis</i>	common tall manna grass	S4S5	secure
<i>Glyceria laxa</i>	northern mannagrass	S4?	secure
<i>Glyceria obtusa</i>	Atlantic manna grass	S4	secure
<i>Glyceria striata</i>	fowl manna grass	S5	secure
<i>Goodyera tessellata</i>	checkered rattlesnake-plantain	S4	secure
<i>Gymnocarpium dryopteris</i>	common oak fern	S5	secure
<i>Hamamelis virginiana</i>	american witch-hazel	S5	secure
<i>Hieracium caespitosum</i>	field hawkweed	SNA	exotic
<i>Hieracium lachenalii</i>	common hawkweed	SNA	exotic
<i>Hieracium pilosella</i>	mouse-ear hawkweed	SNA	exotic
<i>Hieracium scabrum</i>	rough hawkweed	S5	secure
<i>Hippuris vulgaris</i>	common mare's-tail	S4	secure
<i>Huperzia lucidula</i>	shining firmoss	S5	secure

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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Hydrocotyle americana</i>	American marsh pennywort	S5	secure
<i>Hypericum boreale</i>	northern St John's-wort	S5	secure
<i>Hypericum canadense</i>	Canada St. John's-wort	S5	secure
<i>Hypericum ellipticum</i>	pale St. John's-wort	S5	secure
<i>Hypericum gentianoides</i>	false St. John's-wort	SNA	exotic
<i>Ilex verticillata</i>	common winterberry	S5	secure
<i>Impatiens capensis</i>	spotted jewelweed	S5	secure
<i>Iris versicolor</i>	harlequin blue flag	S5	secure
<i>Isoetes</i> sp.	a quillwort		
<i>Juncus brevicaudatus</i>	short-tailed rush	S5	secure
<i>Juncus bufonius</i>	toad rush	S5	secure
<i>Juncus canadensis</i>	Canada rush	S5	secure
<i>Juncus effusus</i>	soft rush	S5	secure
<i>Juncus effusus</i> var. <i>conglomeratus</i>	soft rush	S4?	secure
<i>Juncus militaris</i>	bayonet rush	S5	secure
<i>Juncus pelocarpus</i>	brown-fruited rush	S5	secure
<i>Juncus tenuis</i>	path rush	S5	secure
<i>Juniperus communis</i>	common juniper	S5	secure
<i>Juniperus communis</i> var. <i>depressa</i>	common juniper	S5	secure
<i>Kalmia angustifolia</i>	sheep laurel	S5	secure
<i>Kalmia polifolia</i>	pale bog laurel	S5	secure
<i>Lactuca canadensis</i>	Canada lettuce	S5	secure
<i>Lactuca serriola</i>	prickly lettuce	SNA	exotic
<i>Larix laricina</i>	tamarack	S5	secure
<i>Ledum groenlandicum</i>	common Labrador tea	S5	secure
<i>Leersia oryzoides</i>	rice cut grass	S5	secure
<i>Lemna turionifera</i>	Turion duckweed	S5	secure
<i>Leontodon autumnalis</i>	fall dandelion	SNA	exotic
<i>Leucanthemum vulgare</i>	oxeye daisy	SNA	exotic
<i>Linnaea borealis</i>	twinline	S5	secure
<i>Lobelia dortmanna</i>	water lobelia	S5	secure
<i>Lobelia inflata</i>	Indian tobacco	S5	secure

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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Lolium pratense</i>	meadow fescue	SNA	exotic
<i>Lonicera canadensis</i>	Canada fly honeysuckle	S5	secure
<i>Lonicera villosa</i>	mountain fly honeysuckle	S4S5	secure
<i>Lotus corniculatus</i>	garden bird's-foot trefoil	SNA	exotic
<i>Ludwigia palustris</i>	marsh seedbox	S5	secure
<i>Luzula multiflora</i>	common woodrush	S5	secure
<i>Lycopodium annotinum</i>	stiff clubmoss	S5	secure
<i>Lycopodium dendroideum</i>	round-branched tree-clubmoss	S5	secure
<i>Lycopodium digitatum</i>	southern clubmoss	S5	secure
<i>Lycopodium hickeyi</i>	Hickey's tree-clubmoss	S4?	secure
<i>Lycopodium obscurum</i>	flat-branched tree-clubmoss	S4S5	secure
<i>Lycopodium sitchense</i>	Sitka clubmoss	S3?	secure
<i>Lycopodium tristachyum</i>	blue groundcedar	S4	secure
<i>Lycopus americanus</i>	American water horehound	S5	secure
<i>Lycopus uniflorus</i>	northern water horehound	S5	secure
<i>Lysimachia terrestris</i>	swamp yellow loosestrife	S5	secure
<i>Lythrum salicaria</i>	purple loosestrife	SNA	exotic
<i>Maianthemum canadense</i>	wild lily-of-the-valley	S5	secure
<i>Maianthemum racemosum</i>	large false solomon's seal	S4S5	secure
<i>Maianthemum trifolium</i>	three-leaved false soloman's seal	S5	secure
<i>Matricaria discoidea</i>	pineapple weed	SNA	exotic
<i>Medeola virginiana</i>	Indian cucumber root	S5	secure
<i>Mentha arvensis</i>	wild mint	S5	secure
<i>Mitchella repens</i>	partridgeberry	S5	secure
<i>Mitella nuda</i>	naked bishop's-cap	S5	secure
<i>Monotropa hypopithys</i>	pinetop	S4	secure
<i>Monotropa uniflora</i>	Indian pipe	S5	secure
<i>Morella pensylvanica</i>	northern bayberry	S5	secure
<i>Muhlenbergia uniflora</i>	bog muhly	S5	secure
<i>Myosotis laxa</i>	small forget-me-not	S5	secure
<i>Myrica gale</i>	sweet gale	S5	secure

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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Nemopanthus mucronatus</i>	mountain holly	S5	secure
<i>Nuphar lutea</i>	variegated pond-lily	S5	secure
<i>Nymphaea odorata</i>	fragrant water-lily	S5	secure
<i>Nymphoides cordata</i>	little floatingheart	S5	secure
<i>Oclemena acuminata</i>	whorled wood aster	S5	secure
<i>Oclemena nemoralis</i>	bog aster	S5	secure
<i>Oclemena x blakei</i>	a hybrid white paniced American-aster	S5	secure
<i>Odontites vernus</i>	red bartsia	SNA	exotic
<i>Oenothera biennis</i>	common evening primrose	S5	secure
<i>Omalotheca sylvatica</i>	woodland cudweed	S4S5	secure
<i>Onoclea sensibilis</i>	sensitive fern	S5	secure
<i>Orthilia secunda</i>	one-sided wintergreen	S5	secure
<i>Osmunda cinnamomea</i>	cinnamon fern	S5	secure
<i>Osmunda claytoniana</i>	interrupted fern	S5	secure
<i>Osmunda regalis</i>	royal fern	S5	secure
<i>Oxalis montana</i>	common wood sorrel	S5	secure
<i>Oxalis stricta</i>	European wood sorrel	S5	secure
<i>Packera aurea</i>	golden groundsel	S4	secure
<i>Packera schweinitziana</i>	Schweinitz's groundsel	S4	secure
<i>Petasites frigidus var. palmatus</i>	northern sweet coltsfoot	S4	secure
<i>Phalaris arundinacea</i>	reed canary grass	S5	secure
<i>Phegopteris connectilis</i>	northern beech fern	S5	secure
<i>Phleum pratense</i>	common timothy	SNA	exotic
<i>Photinia floribunda</i>	purple chokeberry	S5	secure
<i>Photinia melanocarpa</i>	black chokeberry	S5	secure
<i>Photinia pyrifolia</i>	red chokeberry	S4?	secure
<i>Picea glauca</i>	white spruce	S5	secure
<i>Picea mariana</i>	black spruce	S5	secure
<i>Pinus strobus</i>	eastern white pine	S5	secure
<i>Plantago major</i>	common plantain	SNA	exotic
<i>Platanthera blephariglottis</i>	white fringed orchid	S4	secure

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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Platanthera clavellata</i>	club spur orchid	S5	secure
<i>Platanthera dilatata</i>	white bog orchid	S4S5	secure
<i>Platanthera psycodes</i>	small purple fringed orchid	S4	secure
<i>Poa compressa</i>	Canada blue grass	SNA	exotic
<i>Poa pratensis</i>	Kentucky blue grass	S5	secure
<i>Pogonia ophioglossoides</i>	rose pogonia	S4	secure
<i>Polygonum arifolium</i>	Halberd-leaved Tearthumb	S2	sensitive
<i>Polygonum cilinode</i>	fringed black bindweed	S5	secure
<i>Polygonum hydropiper</i>	marshpepper smartweed	SNA	exotic
<i>Polygonum punctatum</i>	dotted smartweed	S5	secure
<i>Polygonum sagittatum</i>	arrow-leaved smartweed	S5	secure
<i>Polypodium virginianum</i>	rock polypody	S5	secure
<i>Polystichum acrostichoides</i>	Christmas fern	S5	secure
<i>Pontederia cordata</i>	pickerelweed	S5	secure
<i>Populus grandidentata</i>	large-toothed aspen	S5	secure
<i>Populus tremuloides</i>	trembling aspen	S5	secure
<i>Potamogeton confervoides</i>	alga pondweed	S5	secure
<i>Potamogeton epihydrus</i>	ribbon-leaved pondweed	S5	secure
<i>Potamogeton oakesianus</i>	Oakes' pondweed	S4S5	secure
<i>Potamogeton robbinsii</i>	Robbins' pondweed	S4	secure
<i>Potentilla norvegica</i>	rough cinquefoil	S5	secure
<i>Potentilla simplex</i>	old field cinquefoil	S5	secure
<i>Prenanthes altissima</i>	tall rattlesnakeroot	S5	secure
<i>Prunella vulgaris</i>	common self-heal	S5	secure
<i>Prunus pensylvanica</i>	pin cherry	S5	secure
<i>Pteridium aquilinum</i>	bracken fern	S5	secure
<i>Pyrola elliptica</i>	shinleaf	S5	secure
<i>Radiola linoides</i>	tiny allseed	SNA	exotic
<i>Ranunculus acris</i>	common buttercup	SNA	exotic
<i>Ranunculus flammula var. filiformis</i>	lesser spearwort	S5	secure
<i>Ranunculus repens</i>	creeping buttercup	SNA	exotic
<i>Rhododendron canadense</i>	rhodora	S5	secure

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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Rhynchospora alba</i>	white beakrush	S5	secure
<i>Ribes glandulosum</i>	skunk currant	S5	secure
<i>Ribes lacustre</i>	bristly black currant	S5	secure
<i>Rorippa nasturtium-aquaticum</i>	watercress	SNA	exotic
<i>Rosa nitida</i>	shining rose	S4	secure
<i>Rosa virginiana</i>	Virginia rose	S5	secure
<i>Rubus adenocaulis</i>	glandulose dewberry	SNR	undetermined
<i>Rubus canadensis</i>	smooth blackberry	S5	secure
<i>Rubus chamaemorus</i>	cloudberry	S4	secure
<i>Rubus elegantulus</i>	showy blackberry	SNR	undetermined
<i>Rubus hispidus</i>	bristly dewberry	S5	secure
<i>Rubus idaeus</i>	red raspberry	S5	secure
<i>Rubus idaeus ssp. strigosus</i>	red raspberry	S5	secure
<i>Rubus pensilvanicus</i>	Pennsylvania blackberry	S4	secure
<i>Rubus pubescens</i>	dwarf red raspberry	S5	secure
<i>Rubus setosus</i>	bristly blackberry	S4?	secure
<i>Rumex acetosella</i>	sheep sorrel	SNA	exotic
<i>Rumex orbiculatus</i>	greater water dock	S5	secure
<i>Salix discolor</i>	pussy willow	S5	secure
<i>Salix humilis</i>	upland willow	S5	secure
<i>Salix pyrifolia</i>	balsam willow	S5	secure
<i>Sambucus racemosa</i>	red elderberry	S5	secure
<i>Sanicula marilandica</i>	Maryland sanicle	S4	secure
<i>Sarracenia purpurea</i>	northern pitcher plant	S5	secure
<i>Scheuchzeria palustris</i>	marsh scheuchzeria	S5	secure
<i>Schoenoplectus subterminalis</i>	water bulrush	S5	secure
<i>Scirpus atrocinctus</i>	black-girdled bulrush	S5	secure
<i>Scirpus cyperinus</i>	common woolly bulrush	S5	secure
<i>Scutellaria galericulata</i>	marsh skullcap	S5	secure
<i>Scutellaria lateriflora</i>	mad-dog skullcap	S5	secure
<i>Sisyrinchium montanum</i>	mountain blue-eyed-grass	S5	secure
<i>Sium suave</i>	common water parsnip	S5	secure

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Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Solanum dulcamara</i>	bittersweet nightshade	SNA	exotic
<i>Solidago canadensis</i>	Canada goldenrod	S5	secure
<i>Solidago flexicaulis</i>	zigzag goldenrod	S5	secure
<i>Solidago macrophylla</i>	large-leaved goldenrod	S4	secure
<i>Solidago puberula</i>	downy goldenrod	S5	secure
<i>Solidago rugosa</i>	rough-stemmed goldenrod	S5	secure
<i>Solidago uliginosa</i>	northern bog goldenrod	S5	secure
<i>Sorbus americana</i>	American mountain ash	S5	secure
<i>Sparganium americanum</i>	American burreed	S5	secure
<i>Sparganium angustifolium</i>	narrow-leaved burreed	S5	secure
<i>Spiraea alba</i>	white meadowsweet	S5	secure
<i>Spiraea tomentosa</i>	steepleshub	S5	secure
<i>Spiranthes cernua</i>	nodding ladies'-tresses	S5	secure
<i>Spiranthes lacera</i>	slender ladies'-tresses	S5	secure
<i>Spiranthes lacera var. lacera</i>	slender ladies'-tresses	S5	secure
<i>Streptopus amplexifolius</i>	clasping-leaved twisted-stalk	S4S5	secure
<i>Streptopus lanceolatus</i>	rose twisted-stalk	S5	secure
<i>Streptopus lanceolatus var. lanceolatus</i>	rose twisted-stalk	S5	secure
<i>Symphyotrichum cordifolium</i>	heart-leaved aster	S4S5	secure
<i>Symphyotrichum lanceolatum</i>	lance-leaved aster	S4S5	secure
<i>Symphyotrichum lateriflorum</i>	calico aster	S5	secure
<i>Symphyotrichum novi-belgii</i>	New York aster	S5	secure
<i>Symphyotrichum puniceum</i>	purple-stemmed aster	S5	secure
<i>Tanacetum vulgare</i>	common tansy	SNA	exotic
<i>Taxus canadensis</i>	Canada yew	S5	secure
<i>Thalictrum pubescens</i>	tall meadow-rue	S5	secure
<i>Thelypteris noveboracensis</i>	New York Fern	S5	secure
<i>Thelypteris simulata</i>	bog fern	S4	secure
<i>Torreyochloa pallida</i>	pale false manna grass	S4S5	secure
<i>Triadenum fraseri</i>	Fraser's marsh St. John's-wort	S5	secure
<i>Trichophorum caespitosum</i>	tufted clubrush	S5	secure
<i>Trientalis borealis</i>	northern starflower	S5	secure

March 2016

Table E4.1 Vascular Plant Species Observed in the LAA during Project Field Surveys

Scientific Name	Common Name	AC CDC S-Rank	NSDNR General Status Rank
<i>Trifolium campestre</i>	low hop clover	SNA	exotic
<i>Trifolium hybridum</i>	alsike clover	SNA	exotic
<i>Trifolium pratense</i>	red clover	SNA	exotic
<i>Trifolium repens</i>	white clover	SNA	exotic
<i>Triglochin maritima</i>	seaside arrowgrass	S5	secure
<i>Trillium cernuum</i>	nodding trillium	S4	secure
<i>Trillium undulatum</i>	painted trillium	S5	secure
<i>Tsuga canadensis</i>	eastern hemlock	S4S5	secure
<i>Tussilago farfara</i>	coltsfoot	SNA	exotic
<i>Typha latifolia</i>	broad-leaved cattail	S5	secure
<i>Utricularia cornuta</i>	horned bladderwort	S5	secure
<i>Utricularia geminiscapa</i>	twin-stemmed bladderwort	S4	secure
<i>Utricularia gibba</i>	humped bladderwort	S4	secure
<i>Utricularia intermedia</i>	flat-leaved bladderwort	S5	secure
<i>Utricularia macrorhiza</i>	greater bladderwort	S5	secure
<i>Utricularia minor</i>	lesser bladderwort	S4	secure
<i>Vaccinium angustifolium</i>	late lowbush blueberry	S5	secure
<i>Vaccinium macrocarpon</i>	large cranberry	S5	secure
<i>Vaccinium myrtilloides</i>	velvet-leaved blueberry	S5	secure
<i>Vaccinium oxycoccos</i>	small cranberry	S5	secure
<i>Veronica officinalis</i>	common speedwell	S5	exotic
<i>Veronica scutellata</i>	marsh speedwell	S5	secure
<i>Viburnum lantanooides</i>	hobblebush	S5	secure
<i>Viburnum nudum</i>	northern wild raisin	S5	secure
<i>Vicia cracca</i>	tufted vetch	SNA	exotic
<i>Viola cucullata</i>	marsh blue violet	S5	secure
<i>Viola lanceolata</i>	lance-leaved violet	S5	secure
<i>Viola macloskeyi</i>	small white violet	S5	secure
<i>Viola renifolia</i>	kidney-leaved white violet	S4	secure
<i>Viola septentrionalis</i>	northern woodland violet	S5?	secure
<i>Viola sororia</i>	woolly blue violet	S5	secure