Addendum #1

for the

Class I Environmental Assessment Registration Document

for the

Proposed Highway 113

Transportation and Public Works
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April 2001

Highway 113 Environmental Assessment Report Addendum
April 2001

Upon review of the comments received for the draft submission of the EA Registration Report for Highway 113 on July 28, 2000, several issues arose which the Department of Transportation and Public Works (TPW) wishes to clarify. To accomplish this, the following information is provided as an "addendum" to the original document.

1. Sources of funding

This project will be fully funded with Provincial money from TPW's capital program. Highway 113 will not be part of the National Highway System, and therefore is not eligible for cost sharing with the federal government.

2. Coloured map showing both developed or developable (private) land in contrast to Crown land.

A common concern with regards to this project was the loss of "pristine" land. While much land in the area is not developed at this time, a significant portion is owned by private developers. This area is currently one of the fastest growing areas in the Halifax Regional Municipality. In order to illustrate the potential development (most likely residential subdivisions) in the area, the attached 1:10,000 scale map is provided. The shaded areas identify lands which are either developed or have high development potential. Unshaded land adjacent to the proposed right of way is owned by the Crown. The map also shows the property mapping and associated eight digit parcel identification (PID) numbers.

This map illustrates how quickly development has occurred in the area, as the street network is much more developed than in the mapping available in the mid 1990's when the assessment mapping was provided.

Several developers in this area are waiting for the determination of the Highway 113 alignment so that their development will not conflict with the corridor.

3. Contact with developers

Communication with developers affected by the proposed alignment have been ongoing since the public consultation open house in July of 1998. The following summarizes the private developers and land owners impacted by the proposed highway corridor (from west to east), the type of development, and the planning work which has been conducted since the open house:

a) Piercey Investors Limited

Includes the shaded land adjacent to the Sheldrake Heights subdivision near Highway 103. The owner had designed a complete subdivision expansion prior to the open house which

conflicted with the land required for the proposed Highway 113. This plan has since been revised through the cooperation of TPW to incorporate the land requirements of the highway.

b) Private Landowner

This is a single unaccessible lot of land nearly 3 kilometres east of Highway 103 (PID #00427070). The lot is currently wooded with no intention to develop. TPW does not intend to provide access to this property and therefore will most likely purchase the entire lot. Land not required for the highway would likely be preserved as wilderness.

c) Barrett Enterprises Limited

Includes the two impacted properties east of Lewis and Ragged Lakes. These properties are currently managed woodlots, but the owners are reviewing the potential for developing the land. TPW has met with a company representative and discussed the potential impact to their land. The severed land south of the proposed highway will most likely be secured by TPW and preserved as wilderness.

d) United Gulf Developments Limited

Includes the remaining undeveloped portion of land bordered by Ragged Lake to the north and the power line to the south and east. The owner had presented plans illustrating their intentions for completing this portion of the Kingswood residential subdivision following the open house. Highway alignment information was provided by TPW as requested by the developer to allow for the required highway right of way and revise their development plans.

e) Annapolis Group Incorporated

Includes the shaded land east of the United Gulf Developments Limited property and continuing to the end of the project at Highway 102. Annapolis Group have already submitted a concept plan for the proposed residential subdivision development for the parcel of land west of Kearney Lake Road. The corridor of land required for the proposed Highway 113 has been recognized in this plan.

With the feverish expansion of existing residential subdivisions and birth of new developments along the proposed highway corridor, the impending impacts to developing lands need to be quickly addressed. Therefore, approval of the highway corridor location as a Class I undertaking is required to not only preserve the right of way required for the future construction of Highway 113, but to allow the above noted developers to finalize their development plans and continue with their work.

4. Riparian zone along both sides of the watercourse which connects Maple and Frasers Lakes at the highway crossing location.

An examination of the functional design profile yields sufficient clearance for a ***four metre riparian zone*** along the watercourse between Maple and Frasers Lake. This will allow for the

passage of animals along the river banks. A bridge would likely be required to facilitate animal movement.

5. Blue Mountain - Birch Cove Lakes wilderness area

One concern for the proposed Highway 113 project is related to the wilderness area in the Blue Mountain - Birch Cove Lakes vicinity which is located on a large portion of Crown land adjacent to the Kingswood subdivision. As mentioned above, the attached 1:10,000 scale map illustrates developed or developable (private) land as shaded. The attached handout map also shows the relation of Highway 113 to this area. As can be seen on the handout plan, the highway creates as minimal an impact as possible on the wilderness area.

Although the proposed highway severs a small portion of the wilderness area, it functions as an effective block to development toward the much larger area south of the Kingswood subdivision. Private land severed by the highway could also provide additional land to the wilderness area.

It should be noted that while various groups are proposing this Crown land be designated a wilderness area, it is not one of the areas currently being considered by the Province.

6. Fuel emissions savings

The attached Calculation of Tractor Trailer Emissions and Fuel Usage worksheet is rough and approximated. Nevertheless, the savings are noticeable. The assumptions are as follows:

- the difference in travel distance via Highway 113 and Hammonds Plains Road is negligible. Therefore, only heavy truck traffic currently forced to use Highways 102 and 103 will benefit from a shorter travel distance, and will comprise this calculation.
- the percentage of heavy truck traffic typically ranges from 6 to 15 percent. A conservative value of 9% was used for this calculation.
- the traffic volume predicted for the year 2016 was 11,000 vehicles per day. This value was determined using the Quick Response System II modeling software.
- emissions/consumption data was provided by the External Cost of Truck and Train report by Transport Concepts for Transport 2000, Ottawa, 1995.

Reductions in carbon dioxide emissions of 4,700 tonnes and fuel usage of 1.8 million litres per year are two notable values.

7. Wildlife Crossings

Provision for wildlife crossings along the traversed portion of the Crown land would be assessed as required at the detailed design phase of the project. One proposed location is at the crossing of the watercourse which connects Maple and Frasers Lakes. Locations for recreational crossings will also be examined during the detailed design phase.

8. Plant species list as identified during the environmental assessment field work conducted during the summer of 1999.

See attached

9. Additional Comments

- Drinking water monitoring will be outlined in the environmental monitoring program.

- There was a request to include well log data for the development adjacent to the alignment corridor. TPW chose not to include this information at this time due to the dynamic changes to development in this area. A significant portion of the adjacent lands will most likely be developed for residential use by the time construction would begin, and collection of data closer to that time would be most effective. Current well log data could also change due to the effects of new residential development.

Calculation of Tractor Trailer Emissions and Fuel Usage

Highway 113

Assumptions:

- 9% heavy truck traffic (conservative estimate)
- use 80% of full load factor (compensate for trucks not loaded all of the time)
- traffic volume predicted for 2016 was 11,000 vpd (using QRSII model)
- truck volume = 11,000*0.09 = 990 vpd

Data for a 5 axle Semi, 31.5 tonnes payload:

	(100% load factor) grams per tonne kilometre (g/t-km)
Fuel usage	12.6
NOx	0.36
CO	1.14
VOC	0.095
Particulate matter	0.008
CO2	39.9
Tire wear	1.8

Reduction in consumption/emissions using 80% of full load factor, truck volume of 990 vpd, and a distance savings of 13 km:

	Kilograms per day	Tonnes per year
Fuel usage	4,086	1,492
NOx	117	43
CO	370	135
VOC	31	11
Particulate matter	2.59	0.95
CO2	12,941	4,723
Tire wear	584	213

Litres of fuel saved, using 6 miles per gallon:

	Litres per day	Litres per year
Fuel	4,952	1,807,494

D. Cross, Jan 10/01

Emissions/consumption data from the External Cost of Truck and Train report by Transport Concepts, Ottawa, 1995.

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Tractor Trailer Emissions and Fuel Usage

From the External Cost of Truck and Train report by Transport Concepts, Ottawa, 1995.
Author Darrell Richards, 613-569-1058
Provided by John Pearce, Transport 2000, 469-3474, Dec 19, 2000

1995 Truck

NO_x	24.42 g/L
CO	75.89 g/L
VOC	6.36 g/L
Particulate Matter	0.48 g/L
CO_2	2674.22 g/L

5 axle Semi, 31.5 tonnes payload (100% load factor)

Fuel usage	12.60 g/t-km
NO_x	0.36 g/t-km
CO	1.14 g/t-km
VOC	0.095 g/t-km
Particulate Matter	0.008 g/t-km
CO_2	39.90 g/t-km
Tire wear	1.80 g/t-km

8 axle B-train, 44.2 tonnes payload (100% load factor)

Fuel usage	11.44 g/t-km
NO_x	0.33 g/t-km
CO	1.03 g/t-km
VOC	0.090 g/t-km
Particulate Matter	0.007 g/t-km
CO_2	36.40 g/t-km
Tire wear	1.85 g/t-km

Rare Plant Survey
Highway 113
August 1999
Marian Zinck

Part of the Environmental Impact Assessment involves field investigations to find any known rare plant species on site. The Nova Scotia Museum has suggested that any field studies for the proposed highway corridor include a search for the following plants, in their particular habitats. All but one species are known to grow in adjacent 10 km grid squares to the corridor. The goldenrod, *Euthamia galetorum*, has been found within the confines of the corridor, historically.

English name	Latin name	Habitat where found
Mountain Sandwort	Arenaria groenlandica	bare rock, often with Cladonia, Cladina lichens; wind-exposed sites.
Dwarf Billberry	Vaccinium cespitosum	rocky cliffs and crevices; other acidic sites
an evening-primrose	Oenothera tetragona	dry, sandy soil
horsetail	Equisetum variegatum	streambanks, bogs and thickets; open clearcuts, assoc. With past mining activity
bur-reed	Sparganium multipedunculatum	aquatic or emergent
goldenrod	Euthamia tenuifolia	sandy soils on beaches of lakes
goldenrod	E. galetorum	sandy, peaty soil around lakes or stillwaters

One of the above listed species, Sparganium multipedunculatum, has since been found to be a non-entity in the taxonomic sense. It is now considered to be a variety of S. Angustifolium, one of our more common species.

During field investigations of the proposed corridor of Highway 113, no plant species-at-risk were encountered.

From the existing Kearney Lake Road, north to Highway 102, the terrain is undulating, with many vegetated rocky outcrops alternating with poorly-drained mixed secondary forests. Typical plants of the outcrops included Honeysuckle (Diervilla lonicera), Paper Birch (Betula papyrifera), Red Maple (Acer rubrum), Large-toothed Aspen (Populus grandidentata), Witherod (Viburnum nudum), Huckleberry (Gaylussacia baccata), White Spruce (Picea glauca), White Ash (Fraxinus americana) and Shadbush (Amelanchier sp.). Where exposed bedrock occurred, and the canopy was open, the vegetation appeared to be more alpine in composition. Typical plants such as Cladonia and related lichens and Lowbush Blueberry (Vaccinium angustifolia) dominated. Other upland plants encountered are tabulated below.

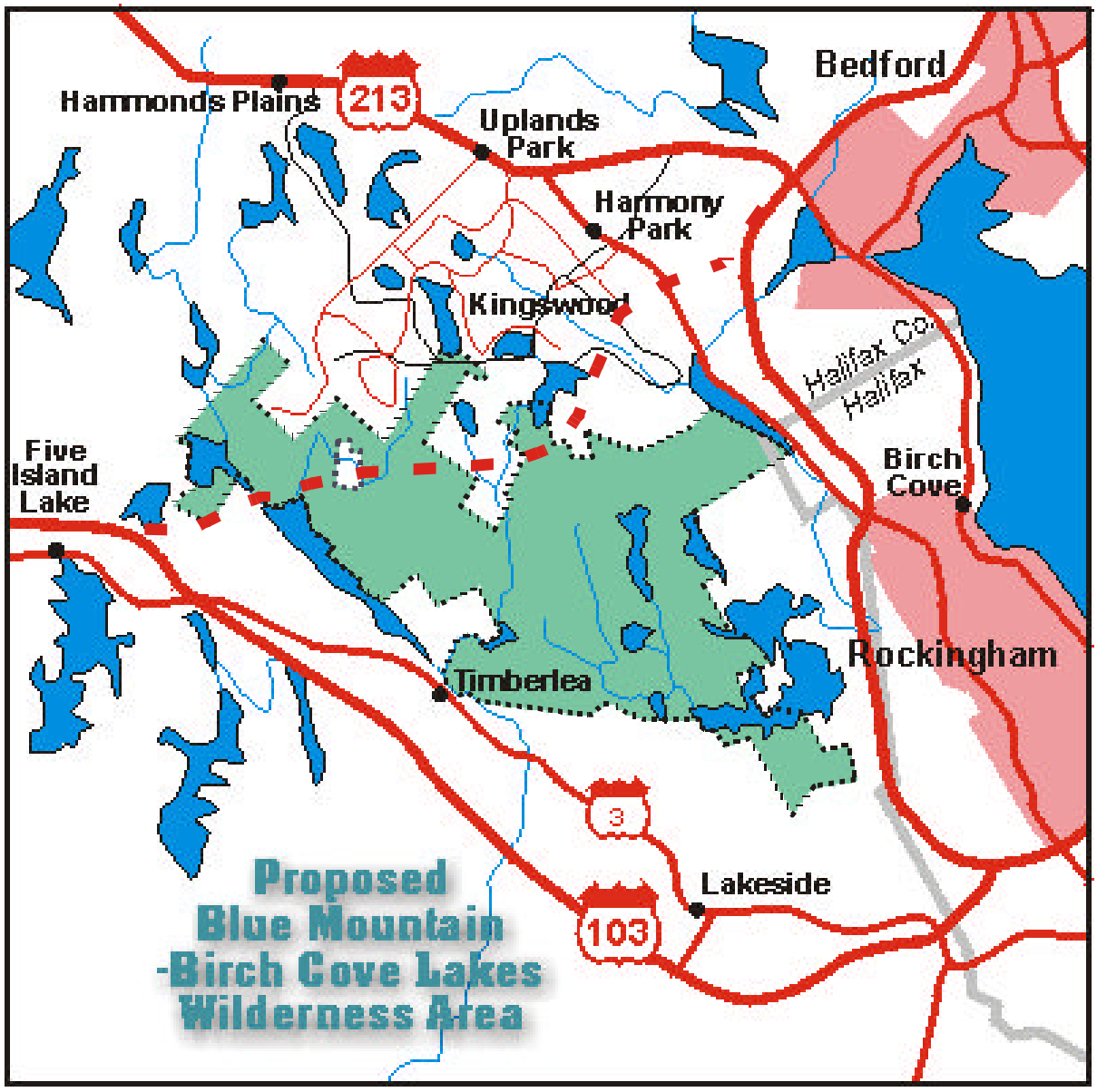
A small wetland between two ridges is dominated by Meadow-sweet (Spiraea alba) and Leatherleaf (Chamaedaphne calyculata). Lesser cover is provided by a sedge (Carex nigrum), Rhodora (Rhododendron canadense), Manna-grass (Glyceria canadensis) and Woolly Bulrush (Scirpus cyperinus).

ENGLISH NAME	LATIN NAME	OCCURRENCE IN NS
Rough Goldenrod	Solidago rugosa	common
Nightshade	Solanum dulcamara	common
Rough-stem Goldenrod	Solidago nemoralis	common
Sheep Laurel	Kalmia angustifolia	common
Teaberry	Gaultheria procumbens	common
Bracken Fern	Pteridium aquilinum	common
Bog Goldenrod	Solidago uliginousum	common
Canada Blueberry	Vaccinium myrtilloides	common
Meadow-sweet	Spiraea alba	common
Sarsaparilla	Aralia nudicaulis	common
Witch-hazel	Hamamelis virginiana	common
Wire Birch	Betula populifolia	common
Sheep Fescue	Festuca ovina	common
Chokeberry	Aronia sp.	Common
Cow-wheat	Melampyrum lineare	common
Crowberry	Empetrum nigrum	common

ENGLISH NAME	LATIN NAME	OCCURRENCE IN NS
Panic Grass	Panicum lanuginosum	common
Bunchberry	Cornús canadensis	common
Indian Cucumber-root	Medeola virginiana	common
Cinnamon Fern	Osmunda cinnamomea	common
Striped Maple	Acer pensylvanicum	common
N ew York Fern	Thelypteris novae-boracensis	common
Goldthread	Coptis trifolia	common
Starflower	Trientalis borealis	common
Wild Lily-of-the-valley	Maianthemum canadense	common
Mayflower	Epigaea repens	common
Common Speedwell	Veronica officinalis	common
Wood Aster	Aster acuminatus	common
Hay-scented Fern	Dennstaedtia punctilobula	common
Rowan	Sorbus aucuparia	common
Rough-stalk Bluegrass	Poa trivialis	common
Lion's-paw	Prenanthes trifoliolata	common
sedge	Carex arctata	common
Rock Polypody	Polypodium virginianum	common
Bristly Sarsaparilla	Aralia hispida	common
Ground-pine	Lycopodium obscurum	common
grass	Brachyelytrum erectum	common

The shoreline of Ragged Lake was surveyed, especially looking for the goldenrod species. Neither were encountered. The plants which dominate this boggy, rocky cove are Canada Holly (Ilex verticillata), Huckleberry (Gaylussacia baccata), False Holly (Nemopanthus mucronata), Sheep Laurel (Kalmia angustifolia), Black Spruce (Picea mariana), sedge (Carex nigrum), Wild Raisin (Viburnum nudum), and Leatherleaf (Chamaedaphne calyculata). A sandy ridge included White Pine (Pinus strobus), Red Maple (Acer rubrum) and Larch (Larix laricina). The aquatic plants are Cow-lily (Nuphar variegatum), Water-lily (Nymphaea odorata), Pickerel-weed

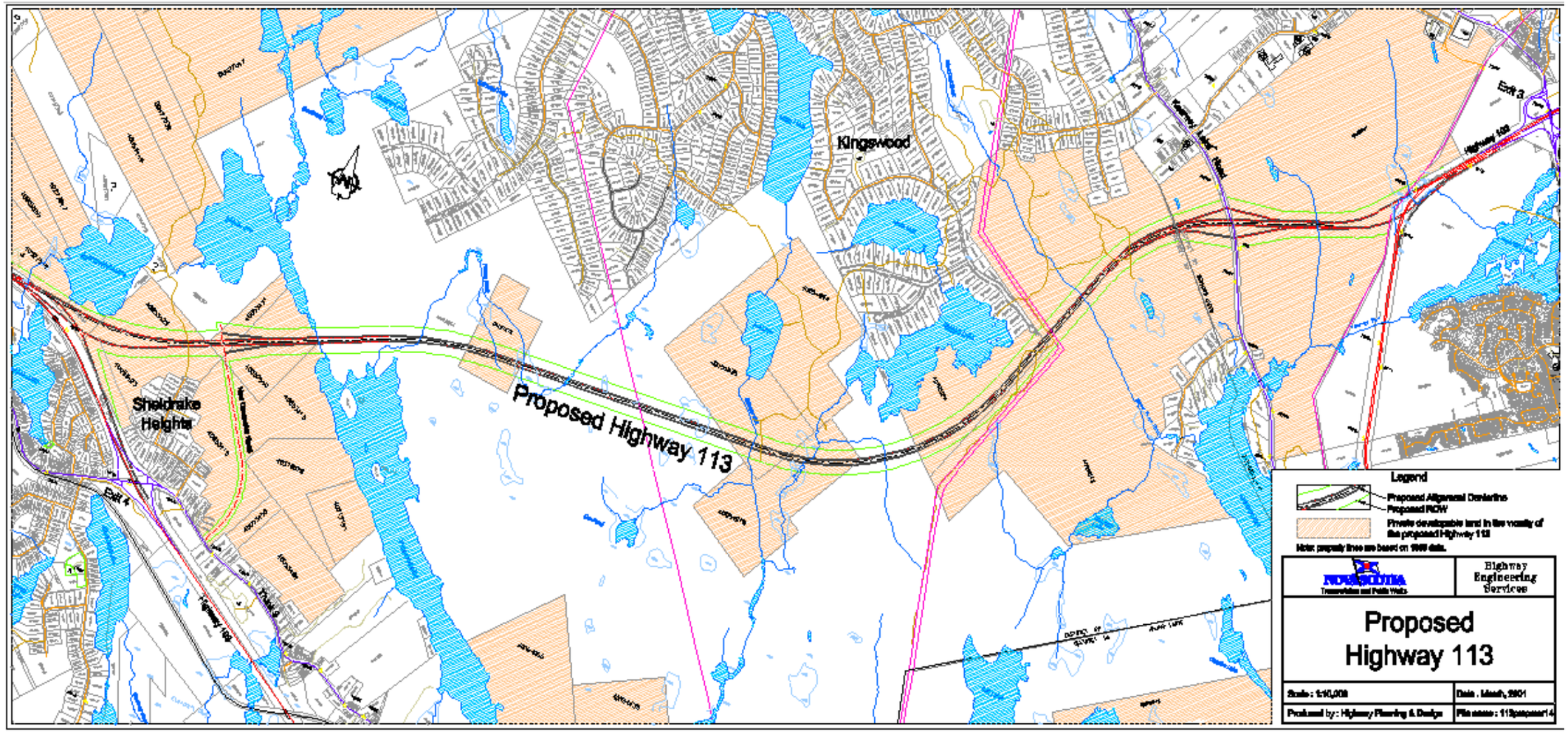
Relation of Highway 113 to the
Birch Cove Lakes Wilderness Area



Legend

Proposed Wilderness Area

Proposed Highway 113


Kingswood
Sheldrake Heights
Proposed Highway 113
Exit 3
Exit 4
Legend
Proposed Alignment Centerline
Proposed ROW
Private developable land in the vicinity of the proposed Highway 113
Highway Engineering Services
Proposed Highway 113