APPENDIX D
BIOPHYSICAL ASSESSMENT REPORT
(Envirosphere Consultants Limited, 2018)

Environmental Assessment Registration Document:
Money Point Quarry Expansion
Money Point, Victoria County, Nova Scotia

Biophysical Assessment:
Money Point Quarry Expansion
342 6014 Road, Bay Road Valley, Victoria County, Nova Scotia – PID 85062008

January 2018

Prepared for:

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Bedford, Nova Scotia

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1 INTRODUCTION

Dexter Construction Company Limited, Bedford, Nova Scotia (Dexter Construction), is proposing to expand an existing quarry in the Bay Road Valley area of Victoria County, near St. Margaret Village in Cape Breton, Nova Scotia. The quarry is presently operating under an industrial approval (NSE Approval No. 2010-072527-01) for quarries less than four hectares in size; an approval to expand the quarry beyond the current size is required under the Environmental Assessment Regulations of the Nova Scotia Environment Act. Dexter Construction contracted Envirosphere Consultants Limited of Windsor, Nova Scotia, to prepare a biophysical and socio-economic overview and assessment of the expansion in support of the approval application. This report contains the results of the overview and assessment. It presents a description of the methodology and scope, existing environment, environmental effects, cumulative effects, discussion, and conclusions. The assessment provides a sufficient level of detail to ensure that all information necessary to allow adequate review of the project is provided; to demonstrate how the assessment was conducted; and to document the information on which the conclusions were based.

2 INFORMATION SOURCES

Information for the biophysical and socio-economic overview and assessment was collected from various sources, including interviews with representatives of the Nova Scotia Department of Natural Resources (NS DNR), Nova Scotia Department of Aquaculture and Fisheries (NS DAF), and Fisheries and Oceans Canada; contacts with organizations, businesses and individuals in the Money Point / Bay St. Lawrence area; review of published information including soil surveys, reports on geology, reports on archeology, First Nations groups consultations (e.g. Cultural Resource Management Group) and natural history (e.g. *Natural History of Nova Scotia*); use of relevant websites and databases (e.g. Nova Scotia Open Data Portal; DNR Significant Habitat and Wetland Databases, Atlantic Canada Conservation Data Centre, and Nova Scotia Museum of Natural History); and use of maps, digital data on land use and property ownership, aerial photos, and 1:50,000 topographic maps. Site visits and walkovers by project personnel were carried out on October 15, 2016 and July 5 and 6, 2017 (fall and late spring/early summer botany surveys); June 22, 2017 (owls and breeding birds); and June 21 and 22, 2017 (site reconnaissance). Key project personnel included Patrick Stewart (M.Sc.), Valerie Kendall (M.Env.Sc.), and Heather Levy (B.Sc. Hons. Environmental Science) (background review, site reconnaissance, wetlands, water quality & fish habitat assessment); Ruth Newell, M.Sc. (botany surveys); and Mr. Fulton Lavender and Mr. Richard Hatch (bird surveys).

3 SITE LOCATION AND STUDY AREA

Money Point Quarry in Victoria County is located approximately one kilometre east of Bay St. Lawrence Road and about 2.5 km south of the community of Bay St. Lawrence, at approximately UTM Zone 20, NAD83, Easting 693,175 and Northing 5205530 near the northernmost tip of Nova Scotia. The site is shown in air photos Air Photos 2009 304-100 & -101, July 11, 2009, and Google Earth satellite imagery from September 28, 2013. The focus area for the assessment is shown on Figures 1 & 2 and Map A-1,

Appendix A. The quarry is shown in Figures 3 & 4. The proposed quarry expansion area will be located entirely within the EA study area.

Figure 1. Project location shown on NTS 1:50,000 mapping.

Figure 2. Study area in relation to local site features in 2009 air photo.

Figure 3. Panoramic view of Money Point Quarry, facing southeast, June 2017.

Figure 4. View of northeast corner of Money Point Quarry and Cape North, June 2017.

4 EXISTING ENVIRONMENT

4.1 PHYSICAL ENVIRONMENT

4.1.1 CLIMATE AND WINDS

The Money Point Quarry study site is an exposed, high elevation location, with strong marine influences from the Gulf of St. Lawrence, Cabot Strait, and the Atlantic Ocean. Average daily temperatures for northern Cape Breton Island[1] in similar settings are moderate, ranging from as low as -6 ℃ in January-February to 18-19 ℃ in July-August. The area has a high annual precipitation of 1375 to 1535 mm (Cheticamp and Baddeck respectively, Figures 5 & 6), about half coming as snow, mainly in January-February (Canadian Climate Normal's 2017) and high snowfall is a significant feature of the Money Point site. Rainfall occurs mainly in April to July, fog is common, and icing of power lines and trees is a common occurrence in winter. Winds are generally strongest in winter, predominantly from the west and south quadrants, occurring mainly from the west in winter (November-February), shifting to north and northwest (February-April), and south (spring to late summer, May-August), and returning to the west in September-October (TDC Atlas 1991). Presence of the broad expanse of open water of the Gulf of St. Lawrence and Cabot Strait leads to elevated wind speeds, particularly from the west and northwest, but northeast winds in winter storms approaching from Sydney Bight and the Atlantic Ocean can also impact the site. Steep slopes and steep-sided valleys characteristic of the area lead to funnelling of winds along valleys, causing higher than normal winds and gusts. The Cape Breton Highlands, in which Money Point is located, can experience severe turbulence, especially when southeast winds occur ahead of low pressure systems on west coasts (e.g. Cheticamp) and create downdrafts and high winds called "*les suètes*" (NavCan 2013). Cloud commonly occurs on the mountaintops in the highlands and Cape North, in particular when winds are from the northeast to northwest (NavCan 2013).

1 Cheticamp and Baddeck, Canadian Climate Normals (2017).

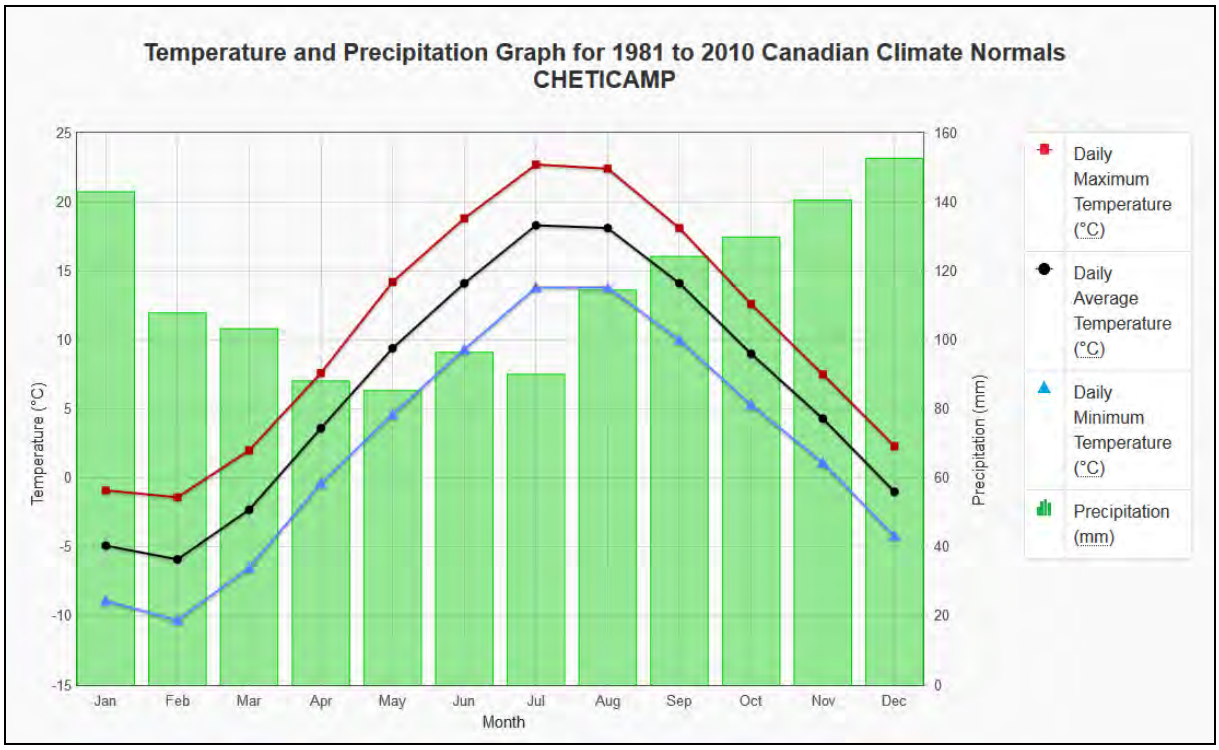

Figure 5. Annual precipitation and temperature cycle, Cheticamp (1981-2010), Canadian Climate Normal's (2017).

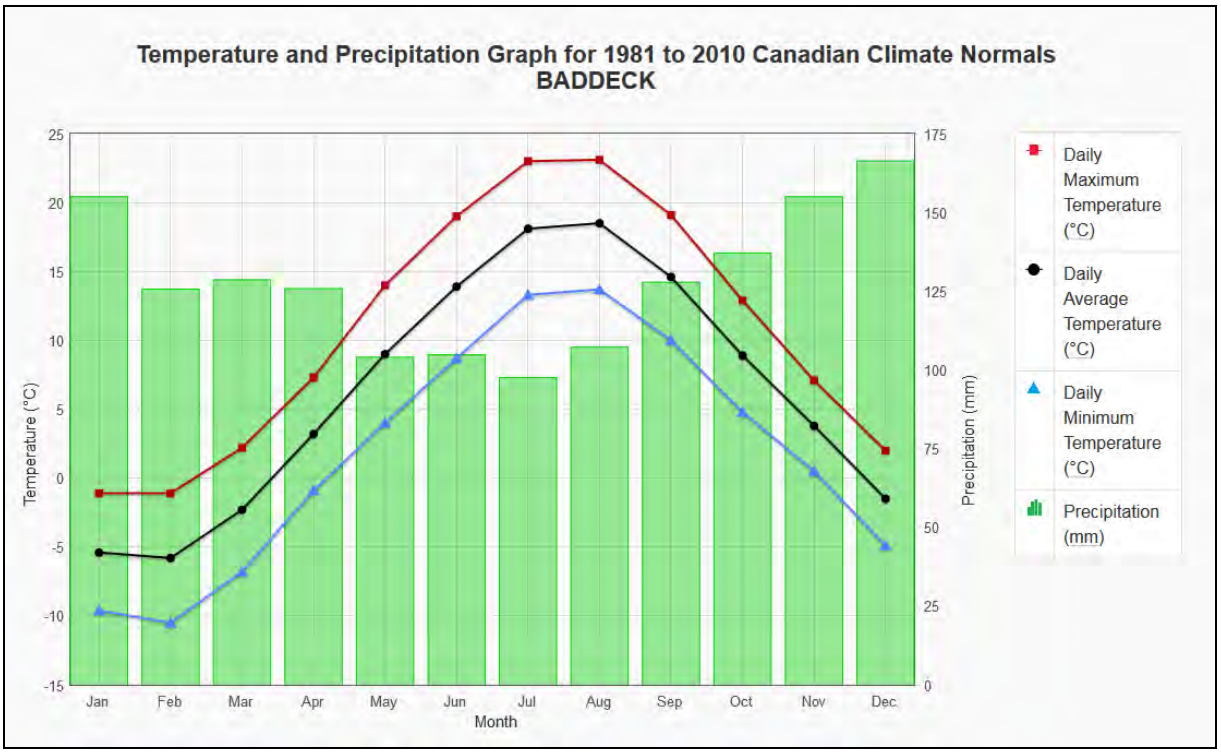

Figure 6. Annual precipitation and temperature cycle, Baddeck (1981-2010) Canadian Climate Normal's (2017).

4.1.2 TOPOGRAPHY AND GEOLOGY

Landscape

Money Point Quarry is located on the northeastern edge of the Cape Breton Highlands, a scenic old geological formation with high elevations, wilderness, and deeply cut valleys that occupies the northernmost part of Cape Breton Island. The site is located on the flat crest of one of the uplands making up North Mountain of Victoria County, which forms the backbone of Cape North, the most northerly mainland projection of Nova Scotia (Figure 1). The quarry is surrounded by steep slopes and sharply incised valleys, descending steeply to the east to meet the Atlantic Ocean; to the north towards Bay St. Lawrence; and to the west to the valley which follows a geological fault line, which connects the remainder of Nova Scotia to the coastal fishing community of Bay St. Lawrence (Figure 1, Maps A-1 & A-4), found north of the site.

Figure 7. West-facing view of the Cape Breton Highlands from the study site, October 2017. Photo by Ruth Newell.

Bedrock Geology

Bedrock at the site consists of old metamorphic formations including Devonian Schists, and Hadrynian to Silurian gneisses of the Cape North Group (Raeside & Barr 1992; Barr et al. 1992; Keppie 2000), and gneisses and schists of the older Pollets River group (Blair River formation) in a narrow band on the west side of the study area (Figure 8). Areas west and northwest of the site are underlain by rocks of the Carboniferous sedimentary Horton, Windsor and Mabou Groups, including sandstone, shale, gypsum and conglomerate deposits (Keppie 2000; Raeside and Barr 1992).

Surficial Geology

Surface materials in the area are derived from the bedrock formations both pre- and post- of the last glacial advance, which have been subjected to glacial activity and post-glacial weathering. Predominant types are: rock residuum found on the upland plateaus, creating a flat to strongly rolling topography consisting of a thin layer of coarse surface materials (1-4 m) with forest cover typical of uplands in the area; and colluvial deposits formed from a mixture of glacial deposits and weathered material forming a blanket over steep valley walls (Stea et al. 1992) (Figure 9). The floor of Bay Road Valley and the lowland bordering on the ocean at Bay St Lawrence, are formed of a combination of stony glacial till of variable thickness which covers much of the area; and coarse (sand & gravel) deposits resulting from post-glacial stream and river flows.

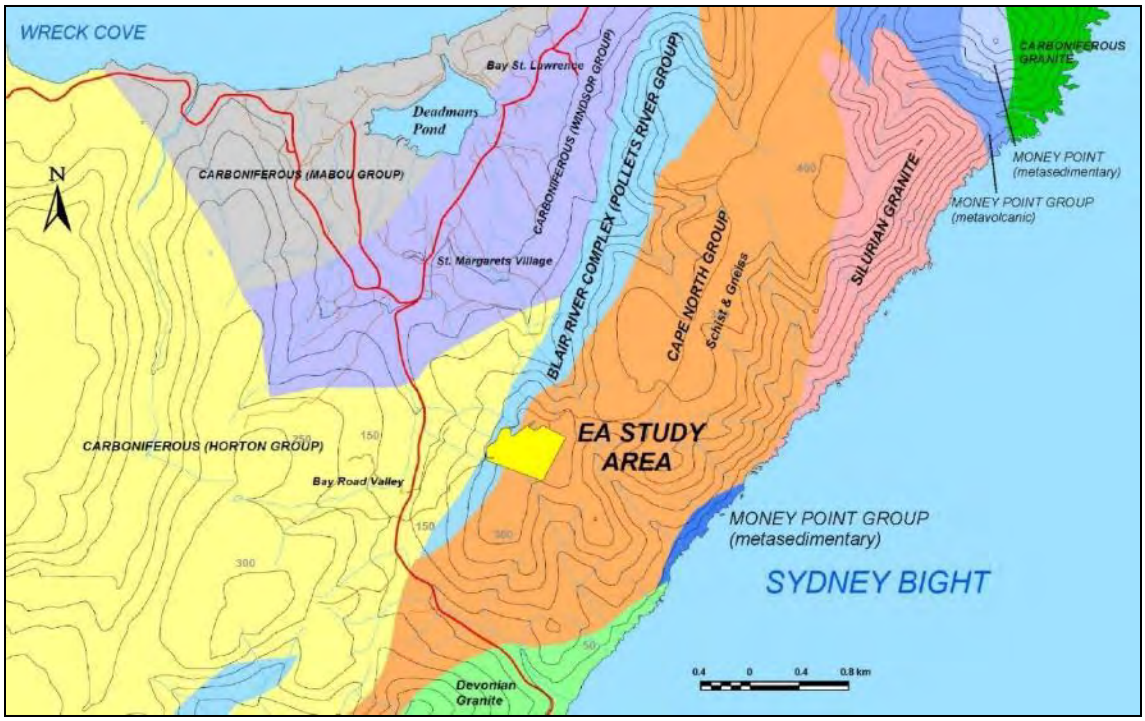

Figure 8. Bedrock geology of the study area. From (Keppie 2000; Raeside & Barr 1992).

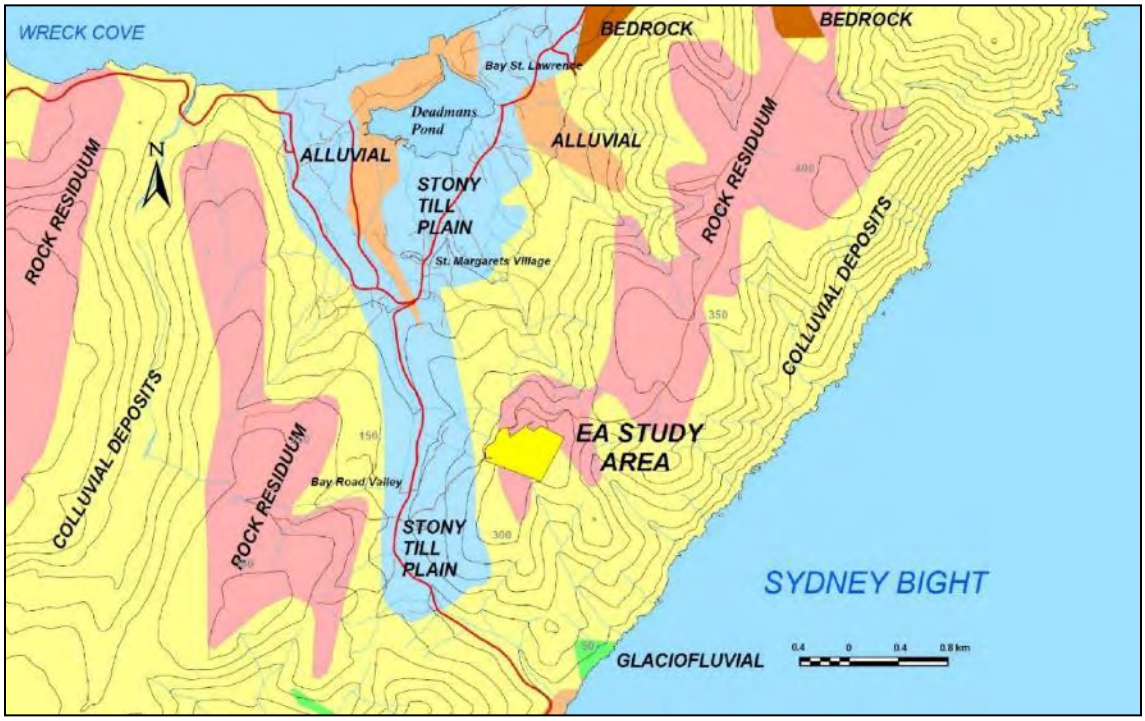

Figure 9. Surficial geology of the study area. From Stea et al. (1992) and digital version (2016).

4.1.3 AIR QUALITY, NOISE & LIGHT

The Bay Saint Lawrence area experiences low levels of artificial light, low levels of ambient noise, and high air quality. There are few sources of artificial light in the area; ambient noise levels reflect local vehicle traffic and operations of the quarry; and air quality is expected to be good due to the rural location and predominantly forested setting.

House and yard lights as well as vehicle lights are the main sources of artificial light at the site. These include light from local residences and traffic traveling on Bay St. Lawrence Road—which is the main road connecting the Cabot Trail, at Cape North, to northern Cape Breton communities (e.g. Aspy Bay, Bay Saint Lawrence, Meat Cove). Traffic levels on Bay St Lawrence Road, which passes west of the quarry, are low and generate little artificial light. Lights at the quarry, as well as 'skyshine' from operations when low cloud occurs, can probably be seen from Bay St Lawrence and residences within Bay Road Valley and 6014 Road (connecting to the quarry) area, but several residents interviewed said they had not noticed light from the quarry.

The Bay Road Valley area is expected to have a relatively high natural baseline air quality typical of areas with high proportions of natural landscape such as neighbouring forested wilderness areas to the west. Low levels of human activity, including vehicle traffic along Bay St. Lawrence Road, as well as that associated with quarry activities, have little impact on overall air quality at the site. Bay St. Lawrence Road is the main road that passes through the area and vehicle use is relatively low along this route. Periodic dust and vehicle exhaust emissions from quarry activities as well as regular residential vehicle traffic are the main contributors to particulates and exhaust emissions, which are expected to be at low levels.

The scope of operations, including annual usage, for the quarry are not expected to change and ambient noise levels in general are expected to be low due to the relatively isolated location of the quarry. Peak vehicle noise on the highway is expected to coincide with vehicle traffic patterns. Morning and evening traffic and noise level peaks, as well as seasonal (summer) peaks in traffic noise corresponding to tourist activities, are expected. The quarry and associated movement of trucks and equipment would continue to provide a minor and periodic source of noise in the area and noise levels reaching the nearest residences are minor[2]. Operations at the quarry are periodic in response to demand for product and are likely one of the main noise sources in the area. Blasting occurs typically one to two times per year; operation of a portable crusher and heavy equipment may take place periodically and add to noise levels when the quarry is in operation; a portable asphalt plant may operate at the site periodically; and trucks are used to transport the product and move the portable equipment as required. Typical noise includes blasting, and sounds from crusher and other heavy equipment operations (e.g. motors, generators, back-up signals etc.). All trucks leaving the site are required to follow best operational practices, established by Truckers Association of Nova Scotia (TANS) and the Nova Scotia Road Builders Association (NSRBA), to minimize emissions. Noise levels arising from the quarry in the future will continue to meet the limits

2 Local residents interviewed did not indicate a problem with noise from the quarry.

established in the Pit and Quarry Guidelines, and are expected to be consistent with those produced by the existing quarry operations at the site.

4.1.4 HYDROLOGY

Money Point Quarry is located on the divide between small watersheds draining into the Gulf of St. Lawrence at Bay St. Lawrence, and into Aspy Bay in Sydney Bight. Uplands have shallow to non-existent overburden and occasional bedrock exposures leading to rapid runoff after precipitation events, into steep, sharply incised watercourse channels or ravines, which are strongly intermittent and dry at other times of year. The lower portions of ravines support small, low-flowing watercourses. The north and west sides of the Money Point Quarry drain into the watershed of Bay St. Lawrence, entering a first order unnamed stream in the Bay St. Lawrence Road Valley (Figure 12); the eastern side drains into Middle Brook; and the south into Peters Brook, both of which traverse precipitous slopes (approximately 1:2 to 1:5) to Aspy Bay. The heads of ravines at the site during the June survey were dry. High snowfall and retention of snow into spring limits periods of peak runoff to the April-May and fall (October to December) periods (Figure 10) with maximum flow estimated in May (0.53 m^3/sec) and minimum between July to September (0.06 to 0.08 m^3/sec)(Figure 10).

A small flow derived from groundwater sources was observed in June 2017 and October 2016 in a ravine that crosses the access road at the southwest corner of the study area (Figure 11). No runoff leaves the quarry site at the surface and precipitation occurring enters groundwater in its entirety directly. Surface runoff from the access road (Road 6014) and some surface runoff from undeveloped slopes are channeled by roadside ditches but all were dry at the time of the June 2017 survey. Flows in the area can be flashy as evidenced by erosion in several locations along the road and in ravines below the access road.

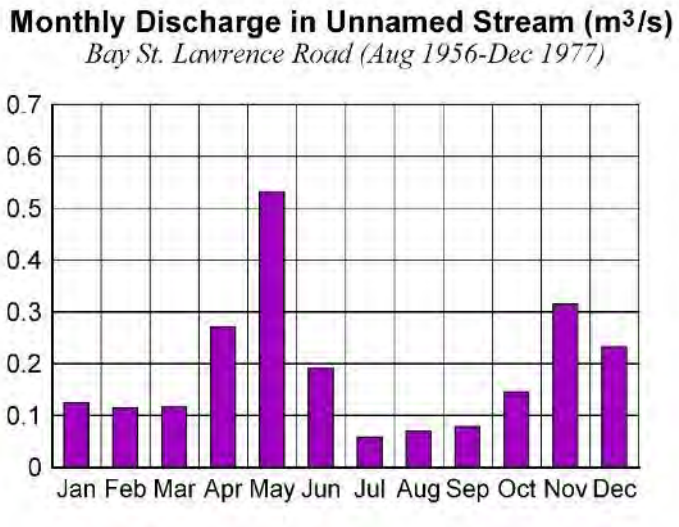

Figure 10. Average monthly flows of unnamed stream in valley along Bay St. Lawrence Road, 1956-1977, based on Wreck Cove Brook, Wreck Cove, and ratios of watershed areas.

Figure 11. Ravine, which leaves southwest corner of the study area (October 2016) (left) and downstream flow channeled through culvert under 6014 Road (water sampling point WS3, Map A- 2 (June 22, 2017) (right).

Figure 12. Unnamed Stream adjacent to Bay St. Lawrence Road below study site, June 21, 2017.

4.1.5 HYDROGEOLOGY

Groundwater at the site develops predominantly on impervious bedrock surfaces beneath overburden, as well as subsurface in cracks, fractures and horizontal surfaces between strata in bedrock; and in till and alluvial deposits, which are more important some locations in the general vicinity. Most precipitation likely leaves the site through a combination of in a shallow sub-surface flow, to enter heads of ravines around the study area, and cracks and fissures in bedrock. There are few areas in the general vicinity of the site where significant depth of overburden occurs and could allow development of near surface dug wells, as well as drilled wells. Ravines leaving the site have small spring-fed flows when they reach lower elevations, and small flows were noted in streams crossing Bay St. Lawrence Road at the site.

4.1.6 SOILS

Most of the land in the vicinity of the Money Point quarry has soils classified as Rough Mountain Land, in which the soil developed on stony, sandy loam till derived from erosion and ice movement on mountain tops, having variable drainage and irregular topography, and not suitable for agriculture (Cann et al. 1963). The Bay Road Valley immediately to the west of the quarry, and extending along the Bay Road through the communities of St. Margaret's Village and Bay St. Lawrence, supports Kirkhill Soils, which have developed on shaly glacial till which predominates in the base of the Valley. These areas have good drainage, strong rolling to hilly topography, moderate stoniness, and have been used for some farming and pasture. Slopes become gentler and the soil less stony and more suitable for these purposes towards the ocean. An area of soils of the Diligence Group occurs southwest of the harbour (Deadman's Pond) at Bay St. Lawrence, developed on grayish brown clay loam till, from finer shale bedrock, and although poorly

drained, the land is more gently rolling and not as stony as the other areas and is more suitable for agriculture (Cann et al. 1963).

4.2 BIOLOGICAL RESOURCES AND HABITAT

4.2.1 TERRESTRIAL ENVIRONMENT

The study site is located on the eastern edge of the Cape Breton Highlands, a landform in northwestern Cape Breton Island characterized by high elevations, typically 400-500 m, striking forested mountains highly dissected by rivers and supporting steep slopes. Vegetation on the plateau is characterized by boreal mixed forest dominated by Balsam Fir, White Birch and White Spruce (Davis and Browne 1997) (Map A-4). Slopes are occupied by mixed deciduous forest including White and Yellow Birch, Sugar Maple and Balsam Fir. Disturbed areas or areas where canopy has been removed by blowdowns or dieoff (e.g. Spruce Budworm damaged forest) can support mountain ash, pin cherry, elderberry, all of which were observed around the Money Point site.

Along the eastern edge of the quarry on the exposed upper margin of the slope, Mountain Ash, Elderberry, Balsam Fir, Pin Cherry and some birch dominate (Figures 13 & 14). The south part of the upland plateau which occupies most of the study area supports softwood forest dominated by Balsam Fir with little understorey vegetation and groundcover of mosses common (Figures 15 & 16). Towards the northwest part of the study area, blowdowns occur along the margins of the softwood forest (Figure 17).

Mixed woodland is the most common forest type present within the study area (Figures 13, 18 & 19). Predominantly softwoods, but with White Birch a dominant, occurs on the shoulders of slopes and occasionally down slopes. Common tree species present included Heart-leaved Birch (*Betula cordifolia*), Red Maple (*Acer rubrum*) and Balsam Fir (*Abies balsamea*). Less common tree species occurring in this habitat included Moose Maple (*Acer pensylvanicum*), Pin Cherry (*Prunus pensylvanica*) and Mountain Maple (*Acer spicatum*). Shrub species observed included Witherod (*Viburnum nudum* var. *cassinoides*), Northern Mountain-ash (*Sorbus decora*) and Wild Raspberry (*Rubus idaeus* ssp. *strigosus*). Common herbaceous vascular plant species observed in this habitat included Bracken (*Pteridium aquilinum*), Wood Aster (*Oclemena acuminata*), Large-leaved Goldenrod (*Solidago macrophylla*), Wild Sasparilla (*Aralia nudicaulis*), Wild Lily-of-the-Valley (*Maianthemum canadense*), New York Fern (*Thelypteris noveboracensis*), Spinulose Woodfern (*Dryopteris carthusiana*) and Bunchberry (*Cornus canadensis*).

Hardwoods, dominated by White and Yellow Birch and Sugar Maple, occupy slopes and lower elevations at the site. The predominant location of hardwood forest is in the southwest corner of the study area (Figure 17). A small area of deciduous woodland occurs in the southwest corner of the survey area. Birches, including Yellow Birch (*Betula alleghaniensis*) and Heart-leaved Birch (*Betula cordifolia*) and maples including Sugar Maple (*Acer saccharum*), Mountain Maple (*A.spicatum*) and Moose Maple (A. *pensylvanicum*), are dominant in this habitat. Herbaceous species present include Drooping Woodland Sedge (*Carex arctata*), Evergreen Woodfern (*Dryopteris intermedia*), Zigzag Goldenrod (*Solidago flexicaulis*), Large-leaved Goldenrod (*Solidago macrophylla*) and Braun's Holly Fern (*Polystichum braunii*). Alternate-leaved Dogwood (*Cornus alterniflolia*) is a scattered to common shrub.

On the exposed northwest slope adjacent to the quarry, an extensive patch of stunted trees and vegetation occurs (Figures 20 & 21). This area has a moderate to steep slope, which extends downwards to the 6014 Road. Much of the woody vegetation here is stunted or dead possibly due to wind exposure and/or other environmental factors, and the area is more open than other woodland habitats at the site. Common woody vegetation here includes Red Elderberry (*Sambucus racemosa* ssp. *pubens*), Bush Honeysuckle (*Diervilla lonicera*), Pin Cherry (*Prunus pensylvanica*), Beaked Hazelnut (*Corylus cornuta*), Balsam Fir (*Abies balsamea*), American Fly Honeysuckle (*Lonicera canadensis*) and Heart-leaved Birch (*Betula cordifolia*). Herbaceous vegetation present includes bracken (*Pteridium aqulinum*), Pearly Everlasting (*Anaphalis margaritacea*), Rough Goldenrod (*Solidago rugosa*), Wood Aster (*Oclemena acuminata*) and Evergreen Woodfern (*Dryopteris intermedia*). The stunted vegetation occurring here has features resembling *krumholtz*—a type of plant community typical to subarctic and subalpine landscapes below the treeline, and which occurs in similar highly exposed settings throughout the Cape Breton Highlands. This type of vegetation is vulnerable to disturbance as regeneration is slow due to harsh climatic conditions and a limited growing season. Woody plants displaying these characteristic features often represent old-growth trees that are unable to reach full size typical to species type (e.g. mature spruce and fir species).

Plant communities at the site are moderately diverse with 67 species recorded (Appendix B). No species of conservation concern were found at the site. Bordering areas of the existing quarry have been revegetated in grasses (Figure 16).

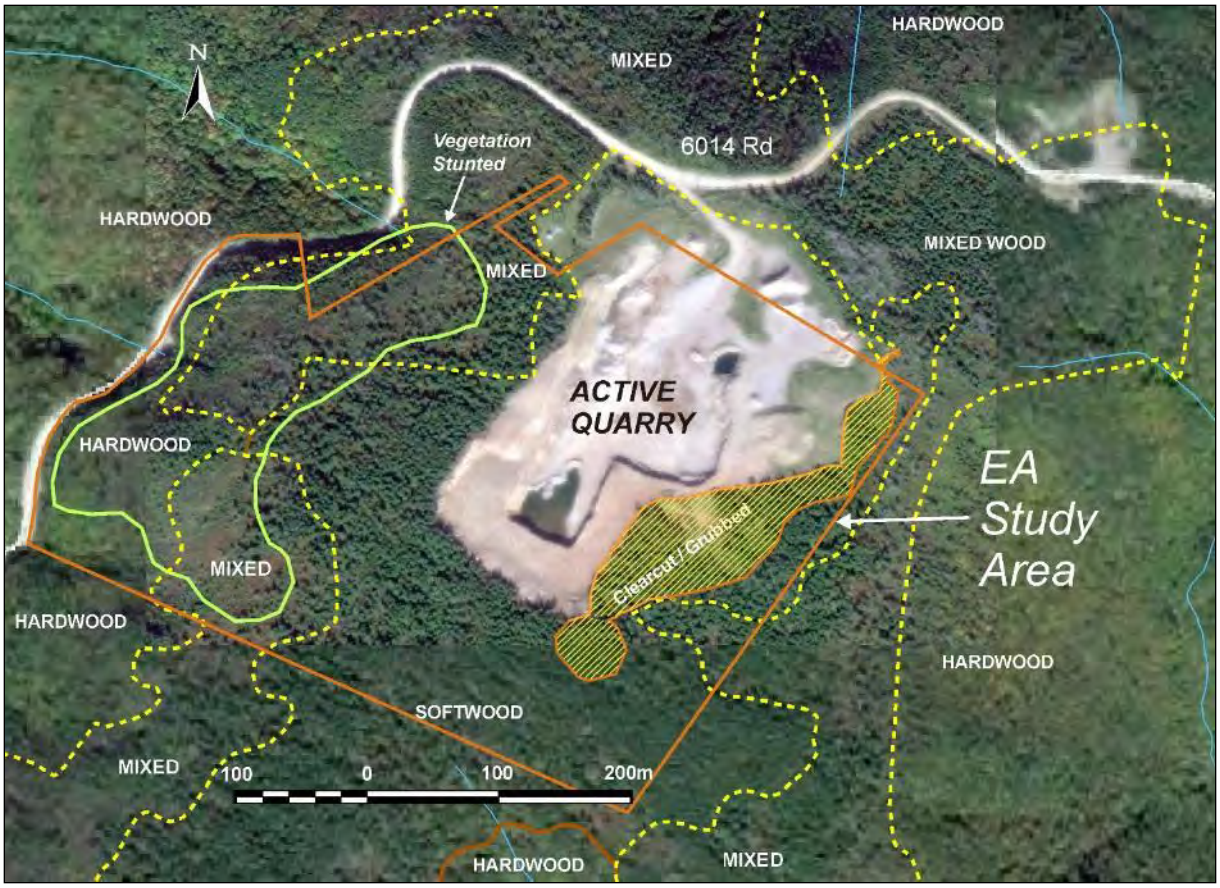

Figure 13. Dominant forest types, Money Point Quarry.

Figure 14. Southeast view of edge of upper slope, with shrubs, balsam fir and remnants of white birch, June 21, 2017.

Figure 15. Softwood forest, dominated by Balsam Fir and mosses, October 2016.

Figure 16. Northeast section of existing site showing softwoods (Balsam Fir) development and revegetated areas of the quarry, June 21, 2017.

Figure 17. Blowdowns on northwestern edge of softwood forest, June 22, 2017.

Figure 18. Mixed forest, Money Point quarry site (October, 2016).

Figure 19. Mixed deciduous forest and understorey of ferns near shoulder of slopes, June 22, 2017.

Figure 20. Northwest facing slope supporting stunted vegetation and shrubs and a view of the coast towards Meat Cove (October 2016).

Figure 21. Patch of ferns and shrubs and stunted trees on northwest facing slope near the location of Figure 20 (June 2017).

4.2.2 AQUATIC ENVIRONMENT

The study area lacks permanent surface water features; in particular there are no permanent first order streams or water bodies on site. Most of the site is on a plateau on a watershed divide, and the only drainage features are ravines that carry intermittent flow originating around the margin of the plateau, and eventually becoming steep channels and sometimes streams fed by springs at lower elevations. Of watercourses in the vicinity of the site, an unnamed first-order stream occupies Bay St. Lawrence Valley approximately 650 m west of the site, and flows to Bay St. Lawrence (Figure 11). South of the site in the Bay St. Lawrence Valley, Polly's Brook flows south and discharges into Aspy Bay. The study area is also a headwater for Peters Brook and Middle Brook, which originate on the southern and eastern slope respectively (Figure 2, Map A - 2) and descend steeply to the ocean. Unnamed streams drain towards Bay St. Lawrence to the north from the general vicinity of the Money Point Quarry through St. Margaret Village and Bay St. Lawrence. The upper portions of the ravines were dry at the time of the survey, but lower reaches are spring-fed and support flow year-round.

Figure 22. Head of ravine on south side of study area (Site WS5, Map A-2)(left) and stream at Bay St. Lawrence Road)(right), June 21-22, 2017.

4.2.3 WATER QUALITY

Surface waters sampled at the site (spring fed flows and flow in an unnamed stream along Bay St. Lawrence Road) were typical of undisturbed natural environments in upper watersheds of bedrock-dominated areas of northern Nova Scotia. Samples showed low conductivities, high transparency and low suspended sediment levels, as well as high oxygen levels and neutral to slightly basic acidity, and were within normal and guideline ranges for the protection of freshwater aquatic life (Table 1). All surface water observed arising from slopes adjacent to the quarry at the time of the survey was derived from springs. Residents of the area noted that 2017 has been an exceptionally dry year, and heads of ravines exiting the study area were dry, so precipitation is not a major source at the time of the survey. The Unnamed Stream that flows along Bay St. Lawrence Road may include surface water from other sources located upstream. Characteristics of natural waters flowing downslope from the vicinity of the Money Point Quarry were similar to those of the Unnamed Stream (Table 1).

Table 1. Water quality measurements from streams in the vicinity of Money Point Quarry.

Site Location & Date	June 22, 2017		
	WS6	**WS7**	**WS3**
Site Description	**Watercourse below Bay St. Lawrence Road**	**Unnamed Stream along Bay St. Lawrence Road**	**Culvert Flow along 6041 Road SW of Study Area**
Temperature ºC	12.1	13.4	--
Dissolved Oxygen (mg/L)	8.5	8.1	--
Dissolved Oxygen (% saturation)	80.3	83.0	--
Conductivity (µs/cm)	76.1	129.2	--
Specific Conductivity (25˚) (µs/cm)	100.8	165.9	--
pH	7.4	7.3	7.4
TSS (mg/L)	3.0	3.5	11.0
Colour	Clear, colourless	Clear, colourless	Clear, colourless
Time (June 22, 2017)	11:36	11:10	12:49
Note: TSS = Total Suspended Solids			

4.2.4 WETLANDS

The quarry property and proposed expansion area have parts that are both well drained and steeply sloping and conditions have not led to wetland development at the site or in the general vicinity. Highland environments are not conducive to establishment of significant areas of wetlands, and the nearest small wetlands to the Money Point Quarry are several kilometres from the site.

4.2.5 FISH & FISH HABITAT

No streams or water bodies, which could support fish, occur within the EA study area. Permanent watercourses at the site form from springs on the lower elevations of slopes outside the study area in steep gradient ravines; intermittent flow occurs at higher elevations. The steep gradient (typically 1:5) of

ravines and watercourses at the site extending to the floor of the valley or to the ocean would be impassible by fish. No direct runoff from the working area of the quarry enters ditches or ravines, which could impact directly on local fish habitat. The unnamed stream at that follows the Bay St. Lawrence Valley is expected to support salmonids, and possibly Atlantic Salmon in addition to trout and other usual freshwater fish for that part of Cape Breton, including brook, rainbow and brown trout; Rainbow Smelt, Sticklebacks (Three-spine, Four-spine and Nine-spine) and American Eel (Parks Canada 2017). One 8-9 cm brook trout was captured there after a 17-hr set of a minnow trap on June 22-23.

4.2.6 BIRDS

Birds are an important component of the ecosystem in the vicinity of the Money Point Quarry. Eighty species of birds have been recorded potentially breeding in the study area (Maritimes Breeding Bird Atlas 2017, 10 km^2 grid square 20PT90, Table 2), but additional species may breed at the site from time to time or were unrecorded. The number, which is half of the total 160 species for Cape Breton Highlands overall (Maritimes Breeding Bird Atlas, 2017), reflects a smaller range of suitable habitat types and proximity to the ocean. Cape North and Money Point are included in the Cape North – Money Point Important Bird Area (IBA)(NS030) (IBA Canada 2017), in particular due to occurrences and breeding of Bicknell's Thrush, and Boreal Owl, both of which are rare in the Maritimes. Bald Eagle nests may occur within the study area and are known to occur in adjacent surrounding areas, particularly in mixed or deciduous forests (D. Anderson, DNR, personal communication, 2017). Bicknell's Thrush favours exposed areas of stunted vegetation and so it is possible that the species occurs at, and potentially breeds in the northwest portion of the study area, although the species was not detected in the bird surveys conducted for the project.

Habitat types in and around the study site include softwood, mixed forest and mature hardwood forest, as well as a stunted mixed forest on the northwest slope of the site (Figure 13). Surveys at the site included: site walkovers and a night owl survey on June 21 and 22, 2017; and ten-minute dawn point count surveys at ten sites on June 22, 2017 (Figure 28). A single Great-horned Owl was heard at the site during the owl survey. The June point-count survey documented 27 species of songbirds (Table 4). Neither Bicknell's Thrush nor Boreal Owl, both known to occur in the area (IBA Canada 2017), were detected in the surveys.

The most common and abundant species at the site were: American Robin, Swainson's Thrush, Magnolia Warbler, Dark-eyed Junco, White-throated Sparrow, Mourning Warbler, and Yellow-rumped Warbler which occurred in all habitat types (Table 3); while American Crow, Yellow-bellied Flycatcher and Common Raven were also relatively abundant (Table 3). Most species (15-16) occurred in sites associated with mature deciduous forest, where the dominant species (most common and abundant) included Magnolia Warbler, American Robin, Swainson's Thrush, White-throated Sparrow and Yellow-bellied Flycatcher, as well as Yellow-rumped Warbler, Mourning Warbler, Dark-eyed Junco, Common Raven, and American Crow, all of which occurred at all sites in the habitat category (Table 4).

Relatively high numbers of several species and overall highest number of species were observed in the mixed forest areas (7-17 species per site and 25 species overall (Table 4)), where important species

included American Robin, Swainson's Thrush, Magnolia Warbler and Dark-eyed Junco (all of which occurred at all sites) and Blue-winged Warbler, and Mourning Warbler and Yellow-rumped Warbler which each occurred at three sites (75%) (Table 4). Softwood stands were dominated by White-throated Sparrow, Dark-eyed Junco, American Robin and Swainson's Thrush, which occurred at all, sites, with Mourning Warbler and Magnolia Warbler, each occurring at four sites (80%). Some less common and abundant species in softwood stands were Yellow-bellied Flycatcher and Yellow-rumped Warbler (Table 4). All birds were expected based on the Maritimes Breeding Bird Atlas (2017) records for the area.

Figure 23. Survey locations for Owls and Songbirds, Money Point Quarry, June 22, 2017. Aerial image is from 2013. Current edge of forest is shown.

Table 2. Birds potentially breeding in the Money Point/Cape North Area of the Cape Breton Highlands (Maritime Breeding Bird Atlas 2017).

Songbirds (Passeriformes)		
Alder Flycatcher	Chipping Sparrow	Palm Warbler‡
American Crow	Common Grackle	Pine Grosbeak
American Goldfinch	Common Raven	Pine Siskin
American Redstart	Common Yellowthroat	Purple Finch
American Robin	Dark-eyed Junco	Red-breasted Nuthatch
Bank Swallow §‡	European Starling	Red-eyed Vireo
Barn Swallow	Evening Grosbeak	Ruby-crowned Kinglet
Bay-breasted Warbler	Fox Sparrow	Ruby-throated Hummingbird
Bicknell's Thrush †	Golden-crowned Kinglet	Savannah Sparrow
Black-and-white Warbler	Gray Jay	Song Sparrow
Blackburnian Warbler	Hermit Thrush	Swainson's Thrush
Black-capped Chickadee	Least Flycatcher	Swamp Sparrow
Blackpoll Warbler	Lincoln's Sparrow	Tennessee Warbler
Black-throated Blue Warbler‡	Magnolia Warbler	Tree Swallow
Black-throated Green Warbler	Mourning Warbler	Veery‡
Blue Jay	Nashville Warbler	White-throated Sparrow
Blue-headed Vireo	Nelson's Sparrow	White-winged Crossbill
Bobolink	Northern Parula	Winter Wren
Boreal Chickadee	Northern Waterthrush	Yellow Warbler
Cedar Waxwing	Olive-sided Flycatcher †	Yellow-bellied Flycatcher
Chestnut-sided Warbler‡	Ovenbird	Yellow-rumped Warbler
Swans, Geese & Ducks (Anatidae)		
Common Merganser		
Pheasants, Grouse and Turkeys (Galliformes, Phasianidae)		
Ruffed Grouse		Spruce Grouse
Cormorants (Pelicaniformes, Phalacrocoracidae)		
Double-crested Cormorant §*		
Raptors (Falconiformes)		
Hawks & Eagles (Accipitridae), Falcons (Falconidae), and Osprey (Pandionidae)		
Bald Eagle ¤	Osprey	Red-tailed Hawk
Woodpeckers (Order Piciformes, Picidae)		
Hairy Woodpecker	Northern Flicker	Pileated Woodpecker
Owls (Strigiformes, Strigidae) and Barn Owls (Strigiformes, Tytonidae)		
Boreal Owl†		Northern Saw-whet Owl
Gannet (Sulidae)		
Northern Gannet§†		
Shorebirds		
Sandpipers & Snipes (Charadriiformes, Scolopacidae)		
Spotted Sandpiper		Willet
Storm Petrels (Hydrobatidae)		
Leach's Storm Petrel § ‡*		

Table 2. Birds potentially breeding in the Money Point/Cape North Area of the Cape Breton Highlands (Maritime Breeding Bird Atlas 2017).	
Kingfishers (Coraciiformes, Alcedinidae)	
Belted Kingfisher	
Swifts (Apodiformes, Apodidae) and Hummingbirds (Apodiformes, Trochilidae)	
Ruby-throated Hummingbird	
Gulls, Terns, Skuas (Charadriiformes, Laridae)	
Herring Gull §	Great Black-backed Gull §
Auks, Murres, Puffins (Charadriiformes, Alcidae)	
Black Guillemot § ‡ *	
† and ¤ indicate rare species in Maritimes, ‡ a regionally rare species and § a colonial species. * marine species likely only as a flyover.	

Table 3. Bird species heard or observed during dawn point count bird surveys conducted June 22, 2017 between 0330 and 0730 hrs at the Money Point Quarry study site. For locations of observation points, see Figure 28.

Bird Species	Mixed forest (Sites 1,2,8,9)		Deciduous (Site 10 & 11)		Softwood (Sites 3-7)	
	Number of sites	Average/ 10 mins	Number of sites	Average/ 10 mins	Number of sites	Average/ 10 mins
PASSERIFORMES						
American Crow	2	0.5	2	1.5	2	0.6
American Redstart	1	0.25	1	0.5	0	0
American Robin	4	6.75	2	5.5	5	2.4
Bay-breasted Warbler	1	0.25	0	0	0	0
Black-capped Chickadee	1	0.25	0	0	1	0.2
Blue-headed Vireo	0	0	1	0.5	0	0
Black and White Warbler	3	1.5	0	0	0	0
Boreal Chickadee	1	0.25	0	0	2	0.6
Black-throated Green Warbler	1	0.5	1	1	0	0
Cedar Waxwing	1	0.5	0	0	0	0
Chestnut-sided Warbler	0	0	1	0.5	0	0
Common Raven	1	0.5	2	1.5	1	0.4
Common Yellowthroat	1	0.5	0	0	0	0
Dark-eyed Junco	4	2.25	2	2	5	2.4
Evening Grosbeak	1	0.25	0	0	0	0
Golden-crowned Kinglet	1	0.25	0	0	1	0.2
Hairy Woodpecker	0	0	1	0.5	0	0
Hermit Thrush	1	0.25	0	0	2	0.4
Lincoln's Sparrow	2	2.5	1	0.5	2	1.2
Magnolia Warbler	4	3.5	2	6	4	2
Mourning Warbler	3	5	2	3.5	4	2.8

Table 3. Bird species heard or observed during dawn point count bird surveys conducted June 22, 2017 between 0330 and 0730 hrs at the Money Point Quarry study site. For locations of observation points, see Figure 28.

Bird Species	Mixed forest (Sites 1,2,8,9)		Deciduous (Site 10 & 11)		Softwood (Sites 3-7)	
	Number of sites	Average/ 10 mins	Number of sites	Average/ 10 mins	Number of sites	Average/ 10 mins
Northern Waterthrush	0	0	1	0.5	0	0
Northern Parula	1	0.25	0	0	0	0
Pine Grosbeak	0	0	0	0	1	0.2
Ovenbird	2	0.75	1	0.5	0	0
Pine Siskin	2	0.5	0	0	2	0.4
Red Crossbill	0	0	0	0	1	0.4
Red-breasted Nuthatch	0	0	1	0.5	0	0
Red-eyed Vireo	0	0	1	1.5	1	0.2
Ruby-crowned Kinglet	2	0.5	1	0.5	1	0.2
Swainson's Thrush	4	6	2	4.5	5	2
White-throated Sparrow	3	2.25	2	3	5	2.4
Yellow-bellied Flycatcher	0	0	2	3	3	0.8
Yellow-rumped Warbler	3	1.5	2	2	3	0.8
SUMMARY						
AVERAGE ABUNDANCE		37.5		39.5		20.6
TOTAL SPECIES IN HABITAT		25		21		20
AVERAGE NUMBER OF SPECIES PER SITE		12.5		15.5		10.2

4.2.7 MAMMALS

A variety of large and small mammal species, including game and furbearing species, are found in Victoria County and may occur at the quarry site. Mammal species expected to occur regularly or occasionally at the quarry site reflect the communities typical of the dominant terrestrial habitat in the surrounding area, which include coniferous, deciduous and mixed forest. Moose occur in the general vicinity of the quarry, and droppings were seen in mixed forest about 200 m south of the study area boundary on June 22, 2017. A moose overwintering area is located approximately four kilometers due west of the study area. Canada Lynx and American Marten (both provincially listed as Endangered) can occur in the study area (D. Anderson, DNR, personal communication, 2017) and much of the Cape North peninsula to the east is a Provincial lynx management area. Other species likely to occur in the general area include carnivores such as fishers; as well as rodents and small mammals including lemmings (Southern Bog Lemming), voles (Rock Vole), shrews (Long-tailed Shrew (designated federally as Special Concern) and American Water Shrew), and bats (Little Brown Myotis—federally and provincially designated as Endangered) (ACCDC, 2017)—which may use the general area for foraging and be present during migration. Bat populations are

diminished at present due to the White Nose Syndrome in North America (S. Weseloh-McKeane, Nova Scotia Museum, personal communication, 2017).

4.2.8 REPTILES AND AMPHIBIANS

Some of the common Nova Scotian amphibians and reptiles are expected to occur at the site, although little wetland and open water habitat is available. No occurrences of typical species were noted during site visits. The unnamed stream and adjacent riparian that runs along Bay Road valley will likely support some amphibian species such as Leopard Frog, Pickerel Frog and Spring Peeper; and lands around the quarry may support snakes, including Maritime Garter Snake (records in the vicinity of the site), Northern Redbelly Snake, and Northern Ringneck Snake, which have all been recorded from Victoria County (Gilhen 1984). Habitat is not present at the site for species of conservation concern such as Wood Turtle or Four-toed Salamander. Snapping Turtle, which is a federally and provincially listed species (Special Concern and Vulnerable, respectively), may occur in the Bay St. Lawrence Valley at the site.

4.2.9 SPECIES AT RISK

Species at Risk are plants or animals whose existence is threatened or which are in danger of being threatened, by human activities or natural events. The Canadian Committee on the Status of Endangered Wildlife in Canada (COSEWIC) presently recommends species to be listed for legal federal protection under the federal *Species at Risk Act* (SARA). At the provincial level, the Nova Scotia Species at Risk Working Group completes assessments and recommendations for a species' status. Nova Scotia maintains a list of legally protected species under the *Nova Scotia Endangered Species Act*. A third status list is the *Nova Scotia General Status of Wild Species*, which is a provincial system used as a "first-alert tool" for identifying and prioritizing species potentially at-risk and does not provide legal protection. General status rankings are assigned by a provincial General Status Species Assessment process based on expert scientific evaluation of a set of criteria. Species listed as "Red" (any species known to be, or believed to be, at risk), and "Yellow" (any species known to be, or believed to be, particularly sensitive to human activities or natural events) are considered priority species. Species that may be at risk of extirpation or extinction are candidates for a detailed risk assessment by COSEWIC, or provincial or territorial equivalents.

Species of conservation concern listed under federal or provincial legislation as well as with general status that occur within five kilometres of the Money Point Quarry study site include both animals and plants. Animals of particular conservation concern in the general are Canada Lynx and American Marten, which are currently listed as "Endangered" under the NS Endangered Species Act, are of concern due to low numbers. Both species are known to frequent the study area, although the main range of American Martin is further to the south in Victoria and Inverness Counties. Bird species occurring within 5 km of the Quarry include: Bicknell's Thrush, Olive-sided Flycatcher and Canada Warbler (all listed under the federal *Species at Risk* and provincial *Endangered Species* acts*);* Barn Swallow and Bobolink (all listed provincially); and Bank Swallow designated as "Threatened" by COSEWIC (ACCDC 2017).

Some species are unlikely to occur in the study area due to the absence of suitable habitat. Both Canada Warbler and Olive-Sided Flycatcher typically are found in wetland habitats, including treed and shrubby

grassy swamps around bog/fen wetlands for Canada Warbler, and treed (black spruce) sphagnum bogs for Olive-Sided Flycatcher, none of which occur on the site. Both Canada Warbler and Olive-sided Flycatcher are known to breed elsewhere in the area, however (D. Anderson, DNR, personal communication 2017). Open fields, marshes, swamps, etc. are typical habitat for Barn Swallow and Bobolink, none of which occurs at the site. Bicknell's Thrush, which breeds in deciduous and mixed forests and foggy upland areas, potentially may occupy some of the mixed and softwood forests and the stunted forest on exposed slopes found here. Eastern Wood Pewee, a bird species listed as "Vulnerable" has been noted to possibly breed in the area (D.Anderson, DNR, personal communication 2017) and mature hardwood forests here are suitable habitat, but the species was not detected at the site in surveys for the Maritimes Breeding Birds Atlas (2017) or in this year's surveys, and there are no records within 5 km of site (ACCDC 2016).

Other animals of conservation concern potentially occurring at the site include Little Brown Myotis (federally and provincially listed as "Endangered"), and the Long-tailed Shrew (designated federally as a species of "Special Concern"). Neither of these animals are documented within a 5 km radius of the study site (ACCDC, 2017). No federally- or provincially-listed plant species of concern were found or reported within five kilometres of the study area (ACCDC 2017) and the botanical surveys of the site did not detect any species of conservation concern. Sixteen plant species, however, with a general status within Nova Scotia as Sensitive (Yellow) potentially occur in the area. These include: One-sided Groove Moss (*Aulacomnium heterostichum*), Northern Birch (*Betula borealis*), Rock Whitlow-Grass (*Draba arabisans*), Squashberry (*Viburnum edule*), Scabrous Black Sedge (*Carex atratiformis*), Slender Cottongrass (*Eriophorum gracile*), Northern Holly Fern (*Polystichum lonchitis*), Pink Crowberry (*Empetrum eamesii*), Northern Blueberry (*Caccinium boreale*), Alpine Bilberry (*Vaccinium uliginosum*), Highland Rush (*Juncus trifidus*), Downy Willowherb (*Epilobium strictum*), Menzies' Rattlesnake-plantain (*Goodyera oblongifolia*), Labrador Bedstraw (*Galium labradoricum*), Satiny Willow (*Salix pellita*) and Metropolitan Timmia Moss (*Timmia megapolitana*); and Spiked Woodrush (*Luzula spicata*), Showy Lady's Slipper (*Cypripedium reginae*), Long-bracted Frog Orchid (*Coeloglossum viride var.virescens*), Northern Maidenhair (*Adiantum pedatum*), Canada Anemone (*Anemone canadensis*), Marsh Lousewort (*Pedicularis palustris*) and Little Yellow Rattle (*Rhinanthus minor ssp. groenlandicus*) with a general status rank of "May be at Risk" (Red) have been observed within a 5 km radius of the study area (Table 5) (ACCDC 2017). None of these species were noted during the spring and fall botany surveys of the study area. Two species with a status within Nova Scotia as Sensitive (Yellow), however, were observed in both fall 2016 and spring 2017 botanical surveys—Tender Sedge (*Carex tenera*) and Blood Milkwort (*Polygala sanguinea*) (Appendix B). A list of plants and animals of concern within a 100-kilometer radius of the study site are included in Appendix C.

Table 4. Records of species of concern within a 5-km radius of Money Point Quarry, Victoria County. Atlantic Canada Conservation Data Centre (ACCDC) Database, December 2016.

Family/Scientific Name		Common Name	Status/Rank				
			SARA	COSEWIC (NPROT[1])	NS ESA (SPROT[2])	General Status of Wild Species Rankings[3]	AC CDC[4] Rankings (GRANK, SRANK[5])
Plants							
Aspleniaceae	*Asplenium trichomanes*	Maidenhair Spleenwort				4 Secure	G5, S3
Aulacomniaceae	*Aulacomnium heterostichum*	One-sided Groove Moss				3 Sensitive	G5, S1S2
Betulaceae	*Betula borealis*	Northern Birch				3 Sensitive	G4G5, S2
Brassicaceae	*Draba arabisans*	Rock Whitlow-Grass				3 Sensitive	G4, S2
Caprifoliaceae	*Viburnum edule*	Squashberry				3 Sensitive	G5, S3
Cyperaceae	*Carex atratiformis*	Scabrous Black Sedge				3 Sensitive	G5, S2
	Eriophorum gracile	Slender Cottongrass				3 Sensitive	G5, S2S3
Dryopteridaceae	*Polystichum lonchitis*	Northern Holly Fern				3 Sensitive	G5, S2
Empetraceae	*Empetrum eamesii*	Pink Crowberry				3 Sensitive	G5, S3
Ericaceae	*Vaccinium boreale*	Northern Blueberry				3 Sensitive	G4, S3
	Vaccinium uliginosum	Alpine Bilberry				3 Sensitive	G5, S3
Gentianaceae	*Halenia deflexa ssp. brentoniana*	Spurred Gentian				5 Undetermined	G5T3?, S1?
Juncaceae	*Juncus trifidus*	Highland Rush				3 Sensitive	G5, S2S3
	Luzula parviflora	Small-flowered Woodrush				4 Secure	G5, S3S4
	Luzula spicata	Spiked Woodrush				2 May Be At Risk	G5, S1
Onagraceae	*Epilobium strictum*	Downy Willowherb				3 Sensitive	G5?, S3
Orchidaceae	*Coeloglossum viride var. virescens*	Long-bracted Frog Orchid				2 May Be At Risk	G5T5, S2S3
	Cypripedium reginae	Showy Lady's-Slipper				2 May Be At Risk	G4, S2
	Goodyera oblongifolia	Menzies' Rattlesnake-plantain				3 Sensitive	G5?, S3
Poaceae	*Trisetum spicatum*	Narrow False Oats				4 Secure	G5, S3S4

Table 4. Records of species of concern within a 5-km radius of Money Point Quarry, Victoria County. Atlantic Canada Conservation Data Centre (ACCDC) Database, December 2016.

Family/Scientific Name		Common Name	Status/Rank				
			SARA	COSEWIC (NPROT[1])	NS ESA (SPROT[2])	General Status of Wild Species Rankings[3]	AC CDC[4] Rankings (GRANK, SRANK[5])
Pteridaceae	*Adiantum pedatum*	Northern Maidenhair Fern				2 May Be At Risk	G5, S1
Ranunculaceae	*Anemone canadensis*	Canada Anemone				2 May Be At Risk	G5, S2
Rubiaceae	*Galium kamtschaticum*	Northern Wild Licorice				4 Secure	G5, S3
	Galium labradoricum	Labrador Bedstraw				3 Sensitive	G5, S2
Salicaceae	*Salix pellita*	Satiny Willow				3 Sensitive	G5, S2S3
Scrophulariaceae	*Pedicularis palustris*	Marsh Lousewort				2 May Be At Risk	G4G5, S1
	Rhinanthus minor ssp. groenlandicus	Little Yellow Rattle				2 May Be At Risk	G5T5?, S1
Timmiaceae	*Timmia megapolitana*	Metropolitan Timmia Moss				3 Sensitive	G5, S1S2
Animals-Birds							
Alcidae	*Fratercula arctica*	Atlantic Puffin				3 Sensitive	G5, S3B,S5N
Anatidae	*Anas discors*	Blue-winged Teal				2 May Be At Risk	G5, S3S4B
Corvidae	*Perisoreus canadensis*	Gray Jay				3 Sensitive	G5, S3
Emberizidae	*Passerella iliaca*	Fox Sparrow				4 Secure	G5, S3S4B
	Ammodramus nelsoni	Nelson's Sparrow		Not At Risk		4 Secure	G5, S3S4B
Fringillidae	*Carduelis pinus*	Pine Siskin				3 Sensitive	G5, S2S3
	Coccothraustes vespertinus	Evening Grosbeak				4 Secure	G5, S3S4B,S3N
	Pinicola enucleator	Pine Grosbeak				2 May Be At Risk	G5, S2S3B,S5N
Hirundinidae	*Hirundo rustica*	Barn Swallow		Threatened	Endangered	1 At Risk	G5, S3B
	Riparia	Bank Swallow		Threatened		2 May Be At Risk	G5, S2S3B
Hydrobatidae	*Oceanodroma leucorhoa*	Leach's Storm-Petrel				4 Secure	G5, S3B,S5M
Icteridae	*Dolichonyx oryzivorus*	Bobolink		Threatened	Vulnerable	3 Sensitive	G5, S3S4B
Paridae	*Poecile hudsonica*	Boreal Chickadee				3 Sensitive	G5, S3

Table 4. Records of species of concern within a 5-km radius of Money Point Quarry, Victoria County. Atlantic Canada Conservation Data Centre (ACCDC) Database, December 2016.

Family/Scientific Name		Common Name	Status/Rank				
			SARA	COSEWIC (NPROT[1])	NS ESA (SPROT[2])	General Status of Wild Species Rankings[3]	AC CDC[4] Rankings (GRANK, SRANK[5])
Parulidae	*Dendroica castanea*	Bay-breasted Warbler				3 Sensitive	G5, S3S4B
	Dendroica striata	Blackpoll Warbler				3 Sensitive	G5, S3S4B
	Wilsonia canadensis	Canada Warbler	Threatened	Threatened	Endangered	1 At Risk	G5, S3S4B
	Dendroica tigrina	Cape May Warbler				3 Sensitive	G5, S2B
	Vermivora peregrina	Tennessee Warbler				3 Sensitive	G5, S3S4B
Regulidae	*Regulus calendula*	Ruby-crowned Kinglet				3 Sensitive	G5, S3S4B
Scolopacidae	*Tringa semipalmata*	Willet				2 May Be At Risk	G5, S2S3B
	Actitis macularius	Spotted Sandpiper				3 Sensitive	G5, S3S4B
Sittidae	*Sitta canadensis*	Red-breasted Nuthatch				4 Secure	G5, S3
Strigidae	*Aegolius funereus*	Boreal Owl		Not At Risk		5 Undetermined	G5, S2?B
Sulidae	*Morus bassanus*	Northern Gannet				4 Secure	G5, SHB,S5M
Turdidae	*Catharus fuscescens*	Veery				4 Secure	G5, S3S4B
	Catharus bicknelli	Bicknell's Thrush	Special Concern	Threatened	Endangered	1 At Risk	G4, S1S2B
	Catharus ustulatus	Swainson's Thrush				4 Secure	G5, S3S4B
Tyrannidae	*Contopus cooperi*	Olive-sided Flycatcher	Threatened	Threatened	Threatened	1 At Risk	G4, S3B
	Empidonax flaviventris	Yellow-bellied Flycatcher				3 Sensitive	G5, S3S4B
Other							
Felidae	*Lynx canadensis*	Canadian Lynx		Not At Risk	Endangered	1 At Risk	G5, S1
Salmonidae	*Salmo salar*	Atlantic Salmon				2 May Be At Risk	G5, S1
	Salvelinus fontinalis	Brook Trout				3 Sensitive	G5, S3

1. NPROT, National conservation status of species, as designated by COSEWIC.
Extinct (X) – A wildlife species that no longer exists.
Extirpated (XT) - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.
Endangered (E) - A wildlife species facing imminent extirpation or extinction.

Table 4. Records of species of concern within a 5-km radius of Money Point Quarry, Victoria County. Atlantic Canada Conservation Data Centre (ACCDC) Database, December 2016.

Family/Scientific Name	Common Name	Status/Rank				
		SARA	COSEWIC (NPROT[1])	NS ESA (SPROT[2])	General Status of Wild Species Rankings[3]	AC CDC[4] Rankings (GRANK, SRANK[5])

Threatened (T) - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Data Deficient (DD)- A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.
Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.

2. SPROT=Provincial Rank/Status of Taxon.

3. General Status of Wild Species Rank listed for Nova Scotia: 0.2=Extinct (Blue); 0.1=Extirpated (Purple); 1=At Risk (Red); 2=May be at Risk (Orange); 3=Sensitive (Yellow); 4=Secure (Green); 5=Undetermined (light grey); 6=Not Assessed (dark grey); 7=Exotic (Black); 8=Accidental (Aqua).

4. Atlantic Canada Conservation Data Centre (ACCDC).

5.
GRANK, Global rarity rank of species, using CDC/NatureServe methods

G1 **Critically Imperiled**—At very high risk of extinction or elimination due to very restricted range, very few populations or occurrences, very steep declines, very severe threats, or other factors.

G2 **Imperiled**—At high risk of extinction or elimination due to restricted range, few populations or occurrences, steep declines, severe threats, or other factors.

G3 **Vulnerable**—At moderate risk of extinction or elimination due to a fairly restricted range, relatively few populations or occurrences, recent and widespread declines, threats, or other factors.

G4 **Apparently Secure**—At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors.

G5 **Secure**—At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.

GU **Unrankable**—Currently unrankable due to lack of information or due to substantially conflicting information about status or trends. NOTE: Whenever possible (when the range of uncertainty is three consecutive ranks or less), a range rank (e.g., G2G3) should be used to delineate the limits (range) of uncertainty.

GNR **Unranked**—Global rank not yet assessed.

G#G# **Range Rank**—A numeric range rank (e.g., G2G3, G1G3) is used to indicate the range of uncertainty about the exact status of a taxon or ecosystem type. Ranges cannot skip more than two ranks (e.g., GU should be used rather than G1G4).

Q **Questionable taxonomy that may reduce conservation priority**—Distinctiveness of this entity as a taxon or ecosystem type at the current level is questionable; resolution of this uncertainty may result in change from a species to a subspecies or hybrid, or inclusion of this taxon or type in another taxon or type, with the resulting taxon having a lower-priority (numerically higher) conservation status rank. The "Q" modifier is only used at a global level and not at a national or subnational level.

C **Captive or Cultivated Only**—Taxon or ecosystem at present is presumed or possibly extinct or eliminated in the wild across their entire native range but is extant in cultivation, in captivity, as a naturalized population (or populations) outside their native range, or as a reintroduced population or ecosystem restoration, not yet established. The "C" modifier is only used at a global level and not at a national or subnational level. Possible ranks are GXC or GHC. This is equivalent to "Extinct" in the Wild (EW) in IUCN's Red List terminology (IUCN 2001).

T **Infraspecific Taxon** (trinomial)—The status of infraspecific taxa (subspecies or varieties) are indicated by a "T-rank" following the species' global rank. Rules for assigning T-ranks follow the same principles outlined above. For example, the global rank of a critically imperiled subspecies of an otherwise widespread and common species would be G5T1.

Table 4. Records of species of concern within a 5-km radius of Money Point Quarry, Victoria County. Atlantic Canada Conservation Data Centre (ACCDC) Database, December 2016.

Family/Scientific Name	Common Name	Status/Rank				
		SARA	COSEWIC (NPROT[1])	NS ESA (SPROT[2])	General Status of Wild Species Rankings[3]	AC CDC[4] Rankings (GRANK, SRANK[5])

A T subrank cannot imply the subspecies or variety is more abundant than the species. For example, a G1T2 subrank should not occur. A vertebrate animal population, (e.g., listed under the U.S. Endangered Species Act or assigned candidate status) may be tracked as an infraspecific taxon and given a T-rank; in such cases a Q is used after the T-rank to denote the taxon's informal taxonomic status.

SRANK, Sub-National (Provincial) Rarity Ranks

S1 Extremely rare throughout its range in the province (typically 5 or fewer occurrences or very few remaining individuals).
May be especially vulnerable to extirpation.

S2 Rare throughout its range in the province (6 to 20 occurrences or few remaining individuals). May be vulnerable to extirpation due to rarity or other factors.

S3 Uncommon throughout its range in the province, or found only in a restricted range, even if abundant in at some locations (21 to 100 occurrences).

S4 Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the Element is of long-term concern (e.g. watch list). (100+ occurrences).

S5 Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions.

S#S# Numeric range rank: A range between two consecutive numeric ranks. Denotes range of uncertainty about the exact rarity of the Element (e.g., S1S2).

SH Historical: Element occurred historically throughout its range in the province (with expectation that it may be rediscovered), perhaps having not been verified in the past 20 - 70 years (depending on the species), and suspected to be still extant.

SU Unrankable: Possibly in peril throughout its range in the province, but status uncertain; need more information.

SX Extinct/Extirpated: Element is believed to be extirpated within the province.

S? Unranked: Element is not yet ranked.

SA Accidental: Accidental or casual in the province (i.e., infrequent and far outside usual range). Includes species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded.

SE Exotic: An exotic established in the province (e.g., Purple Loosestrife or Coltsfoot); may be native in nearby regions.

SE# Exotic numeric: An exotic established in the province that has been assigned a numeric rank.

SP Potential: Potential that Element occurs in the province, but no occurrences reported.

SR Reported: Element reported in the province but without persuasive documentation, which would provide a basis for either accepting or rejecting (e.g., misidentified specimen) the report.

SRF Reported falsely: Element erroneously reported in the province and the error has persisted in the literature.

SZ Zero occurrences: Not of practical conservation concern in the province, because there are no definable occurrences, although the species is native and appears regularly. An NZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations) or transitory. In other words, the migrant regularly passes through the province, but enduring, mappable Element Occurrences cannot be defined.

Table 5. Provincially listed species of concern with potential to occur in the vicinity of the project site (~10km). Nova Scotia Museum records (S. Weseloh Mckeane, NS Museum, pers. comm., 2016).

Scientific Name	Common Name	SARA	COSEWIC (NPROT[1])	NS ESA (SPROT[2])	General Status of Wild Species Rankings[3]	AC CDC [4] Rankings (GRANK, SRANK[5])
PLANTS						
Adiantum pedatum	Northern Maidenhair Fern				2 May Be At Risk	G5, S1
Anemone canadensis	Canada Anemone				2 May Be At Risk	G5, S2
Anemone riparia	Virginia Anemone				3 Sensitive	-, S1S2
Arabis drummondii	Drummond's Rockcress				3 Sensitive	-, S2
Arabis hirsuta	Hairy Rockcress				-	-
Artemisia campestris	Field Wormwood				-	-
Betula borealis	Northern Birch				3 Sensitive	G4G5, S2
Calamagrostis stricta	Slim-stemmed Reed Grass				3 Sensitive	-, S2
Carex adusta	Lesser Brown Sedge				3 Sensitive	-, S2S3
Carex atratiformis	Scabrous Black Sedge				3 Sensitive	G5, S2
Carex castanea	Chestnut Sedge				2 May Be At Risk	-, S2
Carex eburnea	Bristle-leaved Sedge				3 Sensitive	-, S3
Carex scirpoidea	Scirpuslike Sedge				3 Sensitive	-, S2
Coeloglossum viride	Long-bract Frog Orchid				-	-
Cypripedium reginae	Showy Lady's-Slipper				2 May Be At Risk	G4, S2
Diapensia lapponica	Diapensia				2 May Be At Risk	-, S1
Draba arabisans	Rock Whitlow-Grass				3 Sensitive	G4, S2
Draba glabella	Rock Whitlow-Grass				2 May Be At Risk	-, S1
Draba norvegica	Norwegian Whitlow-Grass				2 May Be At Risk	-, S1
Draba pycnosperma	Dense Whitlow-Grass				2 May Be At Risk	-, S1
Empetrum eamesii	Pink Crowberry				3 Sensitive	G5, S3
Epilobium hornemannii	Hornemann's Willowherb				4 Secure	-, S3
Epilobium strictum	Downy Willowherb				3 Sensitive	G5?, S3

Table 5. Provincially listed species of concern with potential to occur in the vicinity of the project site (~10km). Nova Scotia Museum records (S. Weseloh Mckeane, NS Museum, pers. comm., 2016).

Scientific Name	Common Name	SARA	COSEWIC (NPROT[1])	NS ESA (SPROT[2])	General Status of Wild Species Rankings[3]	AC CDC [4] Rankings (GRANK, SRANK[5])
Eriophorum gracile	Slender Cottongrass				3 Sensitive	G5, S2S3
Galium labradoricum	Labrador Bedstraw				3 Sensitive	G5, S2
Gentianella amarelle	Northern Gentian				2 May Be At Risk	-, S1
Geocaulon lividum	Northern Comandra				4 Secure	-, S3
Goodyera oblongifolia	Menzies' Rattlesnake Plantain				3 Sensitive	-, S3
Impatiens pallida	Pale Jewelweed				3 Sensitive	-, S2
Juncus trifidus	Highland Rush				3 Sensitive	G5, S2S3
Luzula spicata	Spiked Woodrush				2 May Be At Risk	G5, S1
Pedicularis palustris	Marsh Lousewort				2 May Be At Risk	G4G5, S1
Poa glauca, ssp. glauca	Glaucous Blue Grass				-	-
Polystichum lonchitis	Northern Holly Fern				3 Sensitive	G5, S2
Saxifraga paniculata	White Mountain Saxifrage				-	-
Shephercia canadensis	Soapberry				3 Sensitive	S2S3
Vaccinium boreale	Northern Blueberry				3 Sensitive	G4, S3
Vaccinium ovalifolium	Oval-leaved Bilberry				2 May Be At Risk	-, S1
Vaccinium uliginosum	Alpine Bilberry				3 Sensitive	-, S3
Veronica serpyllifolia	Thymeleaf Speedwell				-	-
Woodsia glabella	Smooth Cliff Fern				3 Sensitive	S2

1. NPROT, National conservation status of species, as designated by COSEWIC.
Extinct (X) – A wildlife species that no longer exists.
Extirpated (XT) - A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.
Endangered (E) - A wildlife species facing imminent extirpation or extinction.
Threatened (T) - A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction.
Special Concern (SC) - A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats.
Data Deficient (DD)- A category that applies when the available information is insufficient (a) to resolve a wildlife

Table 5. Provincially listed species of concern with potential to occur in the vicinity of the project site (~10km). Nova Scotia Museum records (S. Weseloh Mckeane, NS Museum, pers. comm., 2016).

Scientific Name	Common Name	SARA	COSEWIC (NPROT[1])	NS ESA (SPROT[2])	General Status of Wild Species Rankings[3]	AC CDC [4] Rankings (GRANK, SRANK[5])

species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.
Not At Risk (NAR) - A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances.
2. SPROT=Provincial Rank/status of taxon & Provincial GS Rank.
3. National General Status of Wild Species Rank listed for Nova Scotia: 0.2=Extinct (Blue); 0.1=Extirpated (Purple); 1=At Risk (Red); 2=May be at Risk (Orange); 3=Sensitive (Yellow); 4=Secure (Green); 5=Undetermined (light grey); 6=Not Assessed (dark grey); 7=Exotic (Black); 8=Accidental (Aqua).

4. Atlantic Canada Conservation Data Centre (ACCDC).
5. GRANK, Global rarity rank of species, using CDC/Nature Serve methods; SRANK, Sub-National (Provincial) Rarity Rank.

4.2.10 NATURAL AREAS & WILDERNESS

The Bay St. Lawrence area is one of the most remote locations in Nova Scotia. Situated on the northeastern edge of the Cape Breton Highlands, the area has a relatively high proportion of wilderness both inland and along its largely untouched coast. A low population density is spread along a few major travel routes, connecting it with Aspy Bay some 10 km south. Although settlement and consequent agricultural expansion and logging in past changed the character of the landscape, much of the land has returned to forest in most areas, extending back from access routes along valleys where settlement was most intense, and into the Highlands. A high proportion of Crown Land in the area has been devoted to protected and managed wildlife areas, leaving a high proportion of natural and untouched areas. In addition to preservation for wildlife, hunting and outdoor recreation in wild areas are an important component of experiences of locals and visitors to the area. The presence of wild areas nearby is an important element in the lives of residents. Large areas of wilderness in the Pollets Cove / Aspy Bay wilderness area located a few kilometres west of the Money Point Quarry, as well as the rugged extent of land on North Mountain extending to Cape North on the east, which are largely undeveloped. People living in these areas are exposed to the natural environment day-to-day and appreciate the presence of, and access to, undeveloped land and nature, while accepting the usual activities needed to use the resources (e.g. aggregate quarries, forestry operations) on which many of them depend for their livelihood.

4.3 HUMAN USES OF THE ENVIRONMENT

4.3.1 MI'KMAQ

The Mi'kmaq maintain aboriginal claim to all of the landmass of Nova Scotia, and the Province of Nova Scotia maintains a policy that proponents of industrial development projects consult with the Mi'kmaq concerning their activities. Dexter Construction has contacted First Nations representatives concerning

the present Money Point Quarry expansion project. The study area was once contained within a Mi'kmaw territory known as Wunama'kik ('Foggy Land'). As there are no significant waterways or water bodies that would have been relied upon for transportation and sustenance, the area was unlikely a major resource base for the Mi'kmaw, their ancestors and predecessors prior to the arrival of European settlers, and the coastal lowlands around Bay St. Lawrence would have been more important. There are no records of specific traditional use within the study area by Mi'kmaq; however, there are six traditional use areas approximately three kilometers north of the study area, which indicate use for hunting, fishing, and an encampment (Cultural Resource Management Group (CRM), 2016). Additionally, the Cape Breton highlands are a traditional area for hunting moose (CRM 2016). Presently, no significant Mi'kmaq cultural activities occur in or around the study area although traditional fishing and hunting, in particular moose hunting, continues in the general area of Bay St. Lawrence.

Many of Nova Scotia's Mi'kmaq reside in Cape Breton and access lands throughout the region for various uses such as hunting and fishing, as well as traditional ceremonial activities. The nearest First Nations communities are Wagmatcook, situated in Victoria County on the western side of the Bras d'Or Lakes just west of Baddeck and about 105 km from the quarry site; and Waycobah, about 125 km from the site, also along the Bras d'Or, in Inverness County. The small (0.9 ha) Margaree I.R. 25 Reserve in the Margaree Valley is 85 km southwest of the quarry site, and is administered by the Waycobah First Nation.

Two tribal councils exist in Nova Scotia: the Confederacy of Mainland Mi'kmaq (CMM) and Union of Nova Scotia Indians (UNSI). CMM is a not-for-profit organization incorporated in 1986, whose mission is to promote and assist Mi'kmaq communities. The UNSI, created in 1969, was formed to provide a cohesive political voice for Mi'kmaq people. The Native Council of Nova Scotia (NCNS) represents Mi'kmaq people living off reserve. The NCNS is a self-governing agency located in Truro. The Office of Aboriginal Affairs in Nova Scotia estimates that approximately 35% of Mi'kmaq live off reserve. The goal of NCNS is "to operate and administer a strong and effective Aboriginal Peoples Representative Organization that serves, advocates and represents our community."

The Mi'kmaq Rights Initiative (Kwilmu'kw Maw-klusuaqn; KMK) also represent a number of the First Nations in Nova Scotia. The mission of KMK—whose name means, "we are seeking consensus"— is "to address the historic and current imbalances in the relationship between Mi'kmaq and non-Mi'kmaq people in Nova Scotia and secure the basis for an improved quality of Mi'kmaq life." KMK's objective is to negotiate between the Mi'kmaq of Nova Scotia whom it represents, the province and the Government of Canada, and operates from its main office in Millbrook. The Atlantic First Nations Environmental Network (AFNEN) is an environmental organization of Mi'kmaq communities and organizations. The CMM and UNSI are members of the AFNEN, with the Mi'kmaq Confederacy of PEI in Charlottetown currently the acting coordinator. The AFNEN includes a representative from each Mi'kmaq organization and community interested in environmental issues. The Network meets regularly during the year through meetings, conferences, and the Internet to discuss environmental matters or concerns.

4.3.2 POPULATION AND ECONOMY

The Municipality of the County of Victoria is a largely rural municipality located at the north-eastern tip of Nova Scotia Population is approximately 7,000, and has been declining over the past several decades, dropping 6.3% between 2006 and 2011, but has been stable between 2011 and 2016 (Statistics Canada 2017). The two main population centres in Victoria County are Ingonish and Baddeck (the existing quarry is located approximately 30 kilometers north of Ingonish). Victoria County has the highest percentage of small businesses of all Cape Breton counties because of the focus on natural resources and tourism (Anon 2014). Traditionally, the main industries in the County were fishing along the coast, and farming and forestry inland. Today, tourism is an important local industry, with the Cabot Trail, as well as Cape Breton Highlands National Park, all being located partially within the boundaries of the County (Municipality of Victoria County 2014; Anon 2014). Visitors to Cape Breton Highlands National Park and the surrounding area visit scenic areas along the coast and utilize recreational features, namely coastal and wooded hiking trails. Local businesses around Bay St. Lawrence include a motel, bed and breakfasts, privately owned campgrounds in the general area, a Co-Op store, a credit union, offices of health professionals, and seasonal restaurants and take-outs. The fishery in areas off Bay St. Lawrence and into Aspy Bay support some of the highest landings of lobster in the Province (Coffen-Smout et al. 2013). Bay St. Lawrence is an important local fishing port while many locals also participate in fisheries on the east and west coasts of the island. Lobster, crab, herring, mackerel, and groundfish species such as flounder and hake are harvested in the area when in season (Anon 2003). The fishery is relatively small, however, with average annual landed value of approximately $17 million over the 2012-2016 period in the Aspy Bay – Sydney Bight (DFO Statistical Areas 1 & 4— compared with about $99 million in the Sydney Area (DFO Policy and Economics Branch, Maritimes Region, 2017). Lobster accounts for most (81%) of landed value, followed by sea scallops and crab combined (12%).

In addition to wild saltwater fisheries, eleven shellfish aquaculture leases and a shellfish hatchery for American Oyster and Blue Mussels are operated in the Aspy Bay area (North Harbour and South Harbour) and contribute to the local economy (Government of Nova Scotia 2017). Unlike other parts of Nova Scotia, forestry is not a major contributor to the economy, in part because of the large amount of protected land in parks and wilderness areas, although local private landowners harvest wood commercially and for firewood. Communities in the area face some of the same challenges as elsewhere in rural Nova Scotia, including lack of economic growth and an aging population. Median gross household income for Victoria County is approximately $72,476—comparable to the median family income for Nova Scotia ($77,136) (Statistics Canada Online 2017).

4.3.3 WATER SUPPLY AND RESIDENTIAL WELLS

Nine homes occur within 1 km of the study area. Local residents suggest the majority of the households use a combination of spring-fed water systems and dug wells. Two drilled wells (a commercial well at the Bay St. Lawrence Co-Op and a residential well) are recorded in the NS well log database (Kennedy and Fisher 2013) (Figure 24). Several of the homes along Bay St. Lawrence Road have a combination of gravity fed and shallow surface well systems. One such spring-fed source, which supplies two nearby residences

on Bay St. Lawrence Road, originates in a ravine on the east side of the 6014 Road ("Mountain Road") used by the quarry, and is only about 2 m off the edge of the road. The Municipality of Victoria recently (January 2017) drilled two community water supply test wells, one of which is in the vicinity of this residential supply (Figure 24), and the second which is opposite civic 2648 Bay St. Lawrence Road. The Municipality has been, and is continuing, water quality and flow tests on these wells, most recently in late-October 2017, to confirm their suitability as a municipal water supply for the area (R. Dauphinnee, personal communication, 2017).

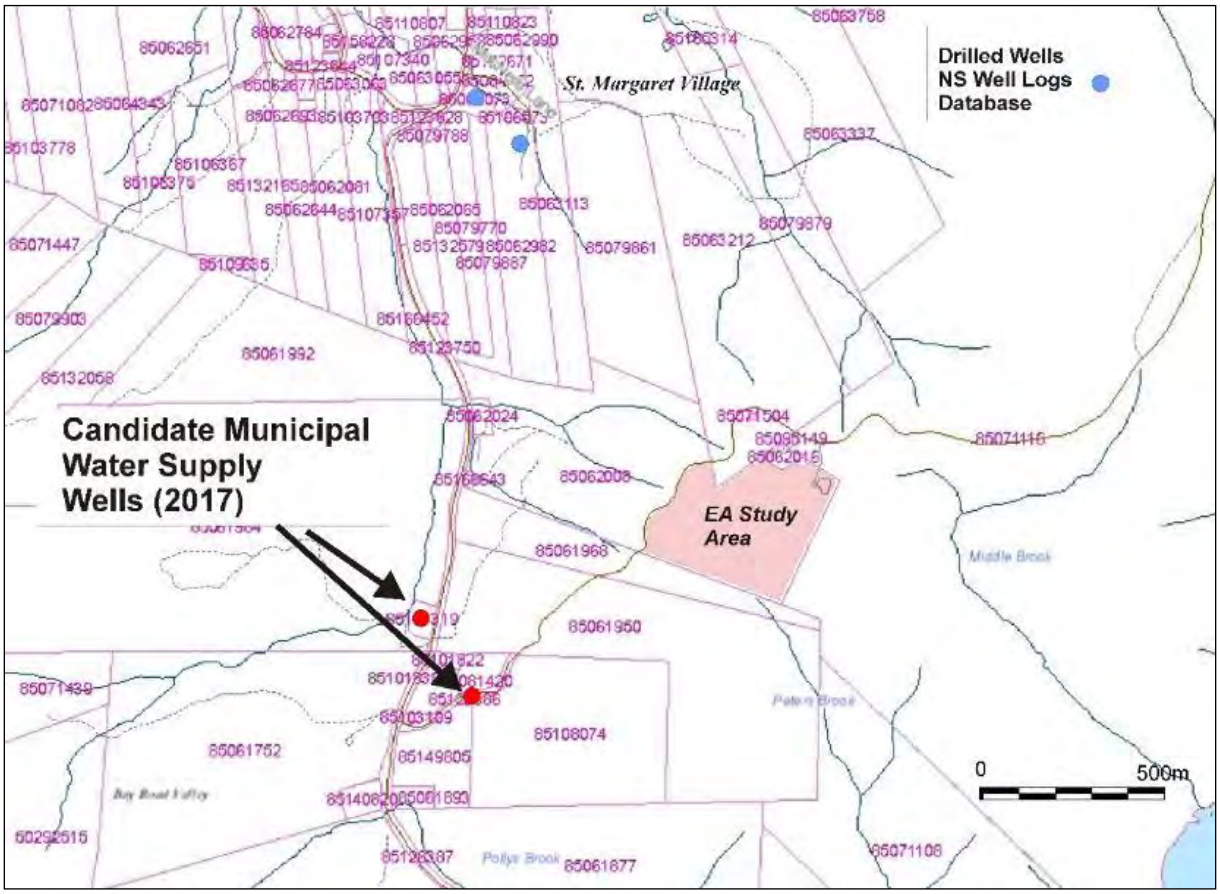

Figure 24. Drilled wells and candidate municipal water supply wells in vicinity of Money Point Quarry.

4.3.4 LAND USE

Land in the vicinity of the quarry is predominantly wilderness and undeveloped forest land, with rural residential use concentrated along the Bay St. Lawrence Road and in the lowland surrounding the communities of St. Margaret Village and Bay St. Lawrence. Limited forestry and commercial use (e.g. quarries) as well as residences, small woodlots, and home-operated businesses are found nearby. Travel routes are used by tourists and outdoor recreational enthusiasts. Hunting, trapping and commercial fishing from the harbour at Bay St. Lawrence are important local activities. A handful of residences are also located along Bay St. Lawrence Road, which is the main travel corridor in the area. Land ownership in the vicinity is a mix of privately owned land and Crown land in the general vicinity (Map A-3).

4.3.5 HUNTING AND TRAPPING

The Money Point quarry site supports many of the common game and fur-bearing species characteristic of Nova Scotia in general, although the remoteness of the site and the prevalence of protected land and active management, allows some less common fur-bearing species, such as Canada Lynx and American Marten, to maintain a presence. Some hunting or trapping activity may take place in the general vicinity of the site, although trapping statistics indicate that Victoria County as a whole has a small harvest of most species. Moose are relatively abundant and are known to overwinter in the area, and White-tail Deer are also common, although the County typically ranks lowest for deer harvest of counties in Nova Scotia. The main furbearers trapped in 2016-2017 were muskrat and coyote, but Victoria County had the lowest beaver, mink and bobcat harvest of any Cape Breton County in 2016-2017, and no lynx, marten, or fisher were trapped there. Snowshoe Hare, Ruffed Grouse, and Ring-Necked Pheasant are the most hunted upland game (Table 2). The four Cape Breton counties have the lowest harvest of Black Bear in Nova Scotia, and harvest in Victoria County is second lowest in the Province, accounting for about 1.3% of provincial harvest. (Table 2). Moose are an important contributor to the hunting economy both for Mi'kmaq and for non-natives, and northern Cape Breton is an important area, and the only area where moose hunting is licensed. One resident noted that moose were very abundant in the general area. The northern parts of Inverness and Victoria Counties (Provincial Moose Hunting Zones 1 & 5 which include the study area) have the highest success rate (harvest for level of effort) for moose harvest in Cape Breton.

Table 6. Five-year summary of wildlife harvested in Victoria County and Nova Scotia (2012 – 2016).

Animal	Victoria Co. Reported Harvest	Provincial Reported Harvest	Percent (%) of total for province
Large Mammals			
Deer*	104	47 839	0.2%
Bear	18	1399	1.3%
Moose**	Not Available	240	--
Upland Game			
Snowshoe Hare	3187	352 605	0.9%
Ruffed Grouse	10 922	222 699	4.9%
Ring-necked Pheasant	207	23 604	0.9%
Fur Harvest (Furbearers)			
Beaver	140	22 114	0.6%
Muskrat	168	82 662	0.2%
Otter	68	2370	2.9%
Mink	28	7424	0.4%
Bobcat	52	4107	1.3%
Fox	81	2585	3.1%
Racoon	16	11 197	0.1%
Skunk	0	293	0.0%
Squirrel	119	8269	1.4%
Weasel	79	3742	2.1%
Coyote	402	10 347	3.9%
Lynx	1	58	1.7%
Marten	5	36	13.9%
Fisher	3	815	0.4%
Total Furbearers	**1162**	**156 019**	**0.7%**

* 2010 – 2015. ** Moose are only harvested in the four Cape Breton Counties.

4.3.6 FORESTRY & AGRICULTURE

Forestry is one of the mix of industries in Victoria County but its impact here is relatively small compared with the rest of Nova Scotia supporting only 3.1% of the provincial labour force engaged in forestry—among the lowest in the province (APEC 2004).

Farming is not a large economic sector in Victoria County and in the immediate study area, accounting for only 0.23% of all farm receipts reported in Nova Scotia in 2010. Victoria County farms reported a total of approximately $1.38 million in farm receipts and a net value of $120,000. Main agricultural activities in Victoria County are cattle ranching and animal production (NS Federation of Agriculture 2014). Little of the agricultural activity would be concentrated in the northern parts of Cape Breton, including the study area, largely due to the terrain and lack of agricultural land, although in the early days of settlement, local agriculture was more important. Lowland areas around Bay St. Lawrence and the Aspy Bay-Dingwall area have soils with greatest capability for agriculture, but soils at the quarry site are generally unfit for

agriculture. Agri-tourism is not established in Victoria County to the same extent that it is in other parts of Nova Scotia (NS Federation of Agriculture 2014).

4.3.7 RECREATIONAL, COMMERCIAL, AND MI'KMAQ FISHING

Recreational fishing provides an important resource and pastime for residents of Victoria County and marine fisheries are the mainstay of Bay St. Lawrence in the area. Lobster is the main fishery at the site, with upwards of fifteen vessels from the local community and the adjacent communities of Capstick and Meat Cove using the harbour there. Marine fishing and the estuarine waters of Deadman's Cove are likely used recreationally, and species including American eel and rainbow smelt occur there. The study area itself is not particularly important for freshwater recreational fishing but rivers in the Bay St. Lawrence area (e.g. Salmon River) and Polly Brook, which originates near the site and flows towards Dingwall, is probably fished recreationally. Mi'kmaq individuals' residing in the area likely use the limited fishing resource as well. Other streams in the area are either too small, are not accessible, or have too steep a gradient to promote fishing.

4.3.8 HISTORICAL, ARCHAEOLOGICAL AND PALAEONTOLOGICAL RESOURCES

The land within the study area was once part of the greater Mi'kmaw territory known as *Wunama'kik*, meaning 'Foggy Land' (CRM 2016). Mi'kmaq originally occupied the area, with Europeans entering in the late- 1700s to 1800s when they pursued mainly agriculture and forestry (CRN 2016). Money Point is named after a cove about 2 km from the Money Point lighthouse, where a French Galleon was wrecked and for years, gold coins kept washing ashore.

Prior to the arrival of European settlers, Mi'kmaq would have used lakes and small watercourses as transportation corridors, providing access to the resource base. The Money Point Quarry site, however, lacks significant rivers, lakes or other freshwater sources that would have been suitable— in particular, sites used for hunting, fishing, and associated encampments. The remaining Cape Breton highlands are, however, a traditional area for hunting moose, and Mi'kmaq moose harvest continues today (CRM 2016). Cabot's Landing Provincial Park in Sugarloaf, about four kilometers south of the site, is thought to be a launching site for Mi'kmaq ocean paddlers whose journeys may have included destinations in coastal Newfoundland.

Archaeology database searches show no records of archaeological sites within the study area, and historic maps do not indicate settlement, except nearer to associated roadways (CRM 2016; S. Weseloh-Mckeane, Coordinator, Special Places, personnel communication, 2017). Based on the lack of historic land use; signs of development such as roads or structures in the vicinity of the Money Point Quarry site; site reconnaissance and the absence of signs of settlement; and other limiting physical factors such as topography, slope and distance from significant fresh water sources, the study area is considered to have low potential for encountering Precontact and/or early historic Native archaeological resources (CRM 2016).

4.3.9 PARKS AND PROTECTED AREAS

The Province of Nova Scotia actively protects natural landscapes and promotes and supports nature-based recreation and conservation through its Provincial Parks system and through management and protection of some of its Crown Lands and a federal national park—Cape Breton Highlands National Park—also occurs south of the site. Several wilderness and protected areas, and a Provincial Park, have been designated in the general area of the quarry site: Polletts Cove-Aspy Fault Wilderness Area (designated); Cabot's Landing Provincial Park; and Cape Breton Highlands National Park. There are also several special wildlife management areas in the vicinity of the study site for Canada Lynx, American Marten and Bald Eagle, and Cape North and Money Point is included in an Important Bird Area (IBA) of that name (IBA Canada, 2017).

The Polletts Cove-Aspy Fault Wilderness Area occupies much of the land west of the study area, spanning both Victoria and Inverness counties. This wilderness area covers 27, 235 hectares, providing protection for the unique highland and coastal features of Cape Breton Nova Scotia, including headlands, forested canyons, and highland barrens (Figure 25). This regionally significant wilderness area provides good opportunities for recreational use such as hiking and hunting, and for which moose is a particular attraction in the area.

Cabot's Landing Provincial Park is located in Victoria County along Bay St. Lawrence Road in Sugarloaf, less than 4 km south of the quarry site (Figure 25). The 8.63 hectares encompass a protected beach along the shore of Aspy Bay (North Harbour Beach) and a national historic site with a cairn commemorating the landfall of John Cabot. The site features views of the steep faces of uplands in the Pollets Cove-Aspy Fault Wilderness Area and offers activities such as beachcombing, bird watching, hiking, and kayaking in addition to backcountry camping and fishing.

Cape Breton Highlands National Park is located in Victoria and Inverness counties south of the Polletts Cove-Aspy Fault Wilderness Area and consists of 94,870 hectares that protect more than 100 km of coastline, steep cliffs, deep river canyons, sheltered coves, rugged mountains and plateaus. It is one of the largest protected wilderness areas in Nova Scotia, and natural features include Acadian, Boreal and Taiga habitats, plants and animals.

A Special Wildife Management Area for Canada Lynx occupies much of Cape North and Money Point on Crown Land there, abutting the quarry study area on the northeast, and as well includes several small patches west of the site. Lynx management areas were designated to protect small, remaining, isolated patches of Lynx distribution in the highland areas of Cape Breton.

American Marten are an important, rare, species in Cape Breton, and Special Management Areas have been designated south of the Cape Breton Highlands National Park to protect remaining small, fragmented patches of marten in the highland areas (northwest and southeast) of Cape Breton. Special management practices would apply regarding development within these areas.

Cape North and the Money Point-Bay St. Lawrence area (and the quarry site) are located within an Important Bird Area (IBA)—the Cape North – Money Point IBA NS030 (Figure 26). This designation, which

has a global significance, reflects the landscape and local occurrence of Bicknells Thrush, a species listed as threatened under the COSEWIC, and Boreal Owl.

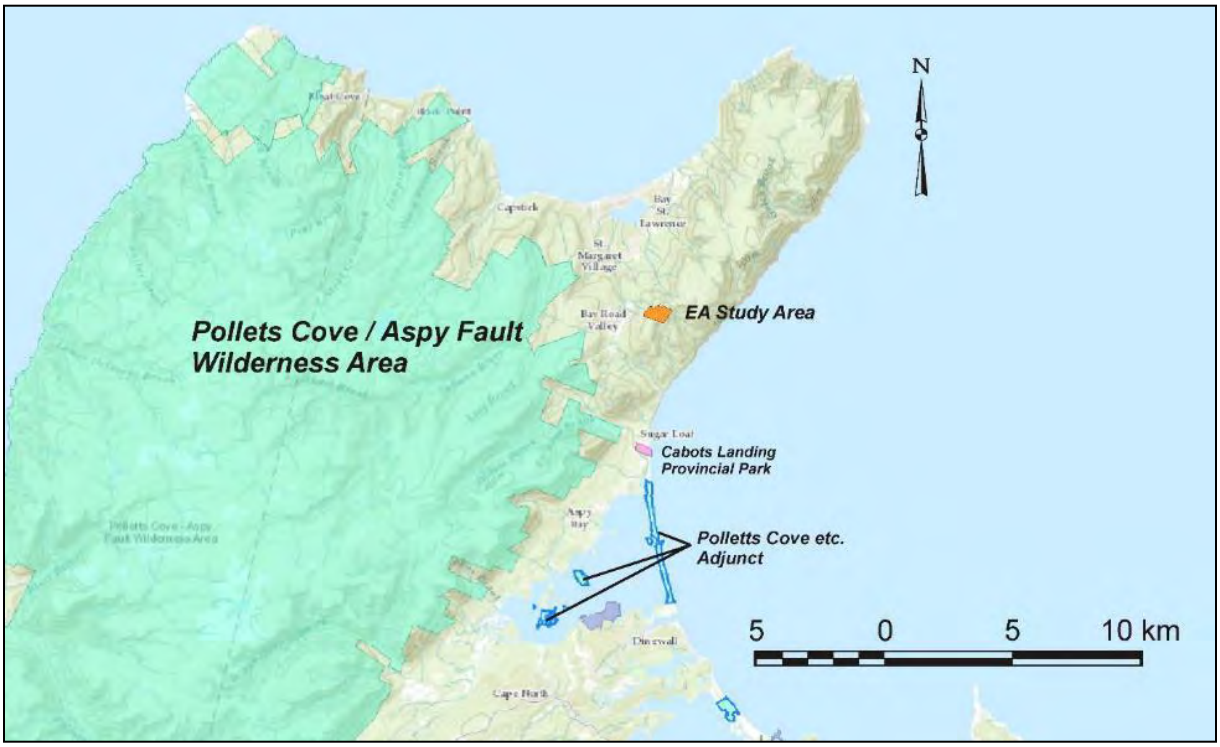

Figure 25. Parks and protected areas in the vicinity of Money Point Quarry.

Figure 25. Cape North - Money Point Important Bird Area (IBA) NS030.

4.3.10 RECREATIONAL/CULTURAL FEATURES

Residents and visitors to Victoria County access natural areas for a wide range of outdoor recreation activities. In the Bay St. Lawrence / Money Point area, the predominant outdoor recreational activities are sightseeing, camping, hiking and snow shoeing, and snowmobiling, as well as hunting and fishing. Locals use ATVs in summer and snowmobiles in winter to access trails running past the quarry. There is a commonly used hiking trail on the old access road to the Money Point lighthouse, and one on the 6014 Road past the quarry known as the Kauzmann Trail (https://capebreton.lokol.me/the-kauzmann-trail), which runs along the crest of North Mountain towards Money Point. Coastal areas from Bay St. Lawrence to Meat Cove are popular tourist routes and coastal lookoffs, with views of St. Paul Island (the most northerly part of Nova Scotia) in clear weather, visible from along the coast. South of the site, the Bay St. Lawrence Road offers spectacular scenic views of mountains, precipitous slopes, and the ocean, along the route between Aspy Bay and the study site. Cabot's Landing Provincial Park is located south of the site, and the nationally significant Cape Breton Highlands National Park are major attractions both for locals and visitors with opportunities for recreational use such as hiking, camping, golfing, and swimming.

4.3.11 RESIDENTIAL USE

Approximately a dozen single family homes and a commercial building (a former telecommunications maintenance shed at the corner of the 6014 Road and the Bay road) cluster mainly along the east side of Bay Road in the area (Map A-3). Lot sizes are large and may include surrounding tracts of forested land. Lifestyles of the residents of the general area along the Bay St. Lawrence Road near the Money Point quarry include younger individuals commuting away from the area for work, retirees maintaining their homes and properties, and residents working locally, including for the quarry. Residents use the area and backcountry for recreation such as walking or hiking, and use of ATVs and winter snowmobiling, as well as for access to natural resources (e.g. firewood). The 6014 Road used to access the quarry is not ploughed in winter and is actively used by locals as a recreational trail. Locals also use a small private gravel pit near the foot of the 6014 Road for campfires. Four of five of the residents living closest to the quarry site were interviewed, none of whom indicated concerns over the operations and accept the presence of the quarry. The owner nearest the quarry road noted truck noise and dust associated with quarry operations, but considered it to be at acceptable levels. The nearest communities for services are Bay St. Lawrence Aspy Bay / Dingwall.

4.3.12 COMMERCIAL/INDUSTRIAL DEVELOPMENT

No active commercial establishments are in the immediate vicinity of the study area but a former telecommunications maintenance shed and garage is located at the junction of Bay St. Lawrence Road and the 6014 Road (Figure 29). Additionally, the quarry site is nearby a CBC Radio FM transmission tower. Most commercial activity in the St. Margaret Village and Bay St. Lawrence centres on tourism and food service including a Co-Op store but there is a Credit Union and a number of offices for professional services.

4.3.13 TOURISM AND VIEWSCAPE

Bay St. Lawrence Road is an important—and the only—travel route for tourists to the community of Bay St. Lawrence, and Meat Cove, which is a popular scenic tourist destination located at the very tip of Nova Scotia in Inverness County (Figure 2, Map A-1). Various trails extending into the back country, including the 6014 Road, are used by hikers, ATV users and snowmobilers, where they are provided with spectacular view in all directions, in particular to Bay St. Lawrence on the north (Figure 28) and Aspy Bay and its coastal barrier beaches to the southeast. The Money Point Quarry in its location on top of a prominence cannot be seen from adjacent areas along the road network and from Bay St. Lawrence (Figure 27) or by travelers at higher elevations along 6014 Road east of the site towards Money Point, although it may be visible from the highest elevations on the route to Money Point. Light and dust at the quarry site are visible from Bay St. Lawrence.

Figure 26. Intersection of Bay St. Lawrence Road and 6014 Road leading to Money Point Quarry, looking north, June 22 2017.

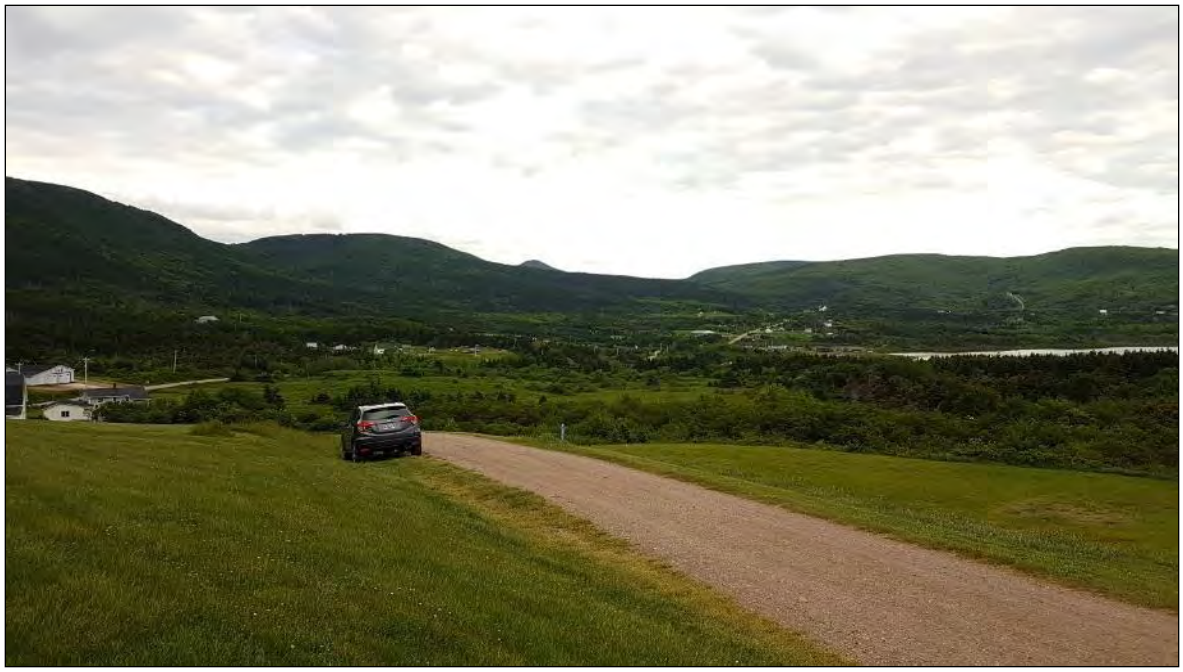

Figure 27. View of Bay St. Lawrence, and the location of the Money Point Quarry (not visible, just over the rise to the right of the first dip on the left). Bay St. Lawrence Valley is in the centre of the photo and the visible peak is Sugarloaf Mountain.

Figure 28. View from 6014 Road near Money Point Quarry, towards Bay St Lawrence Harbour, June 2016.

4.3.14 TRANSPORTATION

Bay St. Lawrence Road, which runs past the quarry site, is a provincial local road and the only highway connection between the Bay St. Lawrence area and the rest of Cape Breton. It supports mainly local traffic, including residential commuting within Victoria County and the rest of the island, as well as a supply route for local industries including the fishing port at Bay St. Lawrence, construction and quarrying, and for tourists visiting the area. The section nearest Money Point Quarry has a low to moderate traffic volume compared with other Highways in the Province, with an annual average daily traffic (AADT) of 810, 110 and 640 vehicles in the years 2008, 2011 and 2014 respectively (Nova Scotia Open Data Portal 2017), similar to the Cabot Trail near where the two highways merge near the community of Cape North ((810, 110 & 640 respectively) (Nova Scotia Open Data Portal 2017). Average daily traffic (ADT) in the same spring-summer period of the same years is higher (913, 102 and 1159 vehicles per day) and a similar relative pattern and traffic volumes are observed on the Cabot Trail (Nova Scotia Open Data Portal 2017). When in operation, the quarry will contribute truck traffic and some heavy equipment traffic (e.g. crushers, asphalt trucks etc.) in the vicinity of the site, typically in the summer / fall construction season. Access to the quarry from Bay St. Lawrence Road is unobstructed with good sight lines (Figure 26) and is not expected to create safety concerns.

5 ENVIRONMENTAL IMPACTS, SIGNIFICANCE, AND MITIGATION

5.1 ASSESSMENT APPROACH AND METHODS

Information for the assessment was obtained from consultants' personal knowledge, from reviews of available information, and knowledge of the purpose and proposed design of the project. The environmental assessment follows *Guide to Preparing an EA Registration Document for Pit and Quarry Developments in Nova Scotia* (NSE September 2009) and uses assessment methodology typical for environmental assessment screenings of this kind. For this assessment a list of valued environmental components (VECs)[3] (also known as VCs)[4], and project activities and outcomes for the expansion of the existing quarry were developed, and the potential for interactions of these activities with VECs was identified. Where interactions were identified, and there was potential for significant impacts if mitigation was not undertaken, mitigating actions or activities have been suggested that will avoid the impact or reduce it to acceptable levels before the project proceeds. The process ensures that all potentially significant impacts on VECs are identified and all potential impacts on them have been considered, and sufficient mitigation planned.

5.2 VALUED ENVIRONMENTAL COMPONENTS

The list of Valued Environmental Components considered for the assessment, and interactions with project components, are presented in Table 8. The environmental effects and potential impacts of the project along with their significance and suggested mitigations are outlined in the following and are summarized in Tables 9 & 10.

3 Valued Environmental Components (VECs) are features or things in the environment, which are particularly important either ecologically, socially, economically or culturally. The environmental assessment addresses potential interactions of the project with each VEC identified, and assesses potential impacts. The process followed involves identifying all the activities or outcomes of the project, which interact with each VEC, and then determining and rating the magnitude of the impact in a standard way, in this case in a manner guided by standard approaches that have been developed for environmental assessments.

4 Valued Environmental Components (VECs) and Valued Components (VCs) are equivalent. Use of the acronym VC is occurring more commonly as a result of its use in environmental assessments carried out under the federal environmental assessment process under the Canadian Environmental Assessment Act (2012).

Table 7. Valued Environmental Components (VECs) for Money Point Quarry Expansion.	
BIOPHYSICAL	SOCIO-ECONOMIC
Air Quality, Noise and Light	Mi'kmaq
Groundwater	Recreation, Tourism & Viewscape
Hydrology	Recreational, Commercial & Mi'kmaq Fishing
Water Quality	Archaeological, Cultural and Historical
Freshwater Aquatic Environments	Economy, Land Use and Value
Terrestrial Environments	Transportation
Fish & Fish Habitat	Residential Use
Flora & Fauna & Habitat	Commercial /Industrial Use
Species at Risk	Water Supplies & Residential Wells
Natural Areas & Wilderness	Parks & Protected Areas
	Forestry, Hunting & Trapping

5.3 SOCIOECONOMIC IMPACTS

5.3.1 MI'KMAQ

The Mi'kmaq maintain a general interest in all lands in Nova Scotia and claim they have never surrendered, ceded, or sold the Aboriginal title, and that they claim all of Nova Scotia. As co-owners of the land and its resources, they expect that any potential impacts to rights and title be addressed (T. Gaudet, KMKNO, personal communication 2014). Mi'kmaq occupied much of Nova Scotia prior to European contact, and lands were used to varying degrees for habitation, hunting and fishing, as noted in Section 4.3.1. In more recent times, treaties made with the British and continued through Canadian law have maintained their rights. The Bay St. Lawrence Valley adjacent to which the quarry is located, may have been used as a transportation route as Mi'kmaq migrated between areas; however there is low potential for occurrence of Mi'kmaq archaeological resources at the quarry site (CRM 2016).

Operation of the Money Point Quarry will use land that would otherwise be occupied by terrestrial ecosystems and would not likely used for Mi'kmaq activities or by other residents for activities such as nature-walks, and hunting or fishing (either recreationally or for subsistence). Best management practices used at the site will reduce any potential impacts quarry activities may have on water quality and quantity. The land area affected is small in relation to the available wildlife habitat in the area, and would not likely affect moose populations, which are particularly important for Mi'kmaq hunting in the Bay St. Lawrence & Cape Breton Highlands area, and there are no likely cumulative effects of other activities in the area; consequently none of these effects are considered significant.

5.3.2 RECREATIONAL ACTIVITIES

Recreational use and nature appreciation of the environment in the vicinity of the site consists principally of walking/hiking, camping, hunting, fishing, and general enjoyment of home-based recreation (e.g. gardening). Only hiking and nature appreciation, which takes place in the summer, would be affected by quarry activities—principally by vehicle traffic—and then principally when the quarry is operating. Operations at the quarry would be cyclic, likely occupying several weeks during the construction season

during the years in which the site is active, and the facilities are well maintained. Although quarry operations could likely be heard and residents would experience truck traffic and other effects of quarry operations, the frequency and scope of the quarry is not expected to increase from past use, and any impact on normal activities of residents as a result of the proposed quarry expansion are expected to be negligible.

5.3.3 TOURISM AND VIEWSCAPE

The Money Point quarry would have little influence on tourism and viewscape. The property is located approximately one kilometer from the Bay St. Lawrence Road, and is not currently visible from either the highway or from 6014 Road, which leads to Cape North and Money Point, and is used by hikers and locals. Truck and equipment traffic accessing and exiting the 6014 Road onto the Bay St. Lawrence Road is expected to be the main interaction with tourists. This traffic is expected be occasional, will be similar now as in the future, and would likely be only a minor impediment to tourist vehicle traffic in the area. The intersection has good sightlines and is well maintained, and is not a particular safety concern; however use of signage (e.g. "Trucks Turning") during periods of onsite activity, would improve safety by alerting travelers. Lights and dust, if present, at the site can be seen from Bay St. Lawrence, but would be controlled by proper environmental management practices at the site. Overall the impacts on viewscape and tourism are expected to be negligible.

5.3.4 RECREATIONAL, COMMERCIAL & MI'KMAQ FISHING

There are no significant watercourses supporting fish in the immediate vicinity of the quarry, and the presence of the quarry will not result in significant changes in flow regime or water quality in waterways downstream of the site. Water quality of the runoff from the quarry is likely to be good for salmonids, including low turbidity and neutral pH, which would lead to good quality of waters downstream for fish. Overall a negligible impact of the quarry on fishing is expected.

5.3.5 ARCHAEOLOGICAL/CULTURAL/HISTORICAL

The land proposed for the quarry expansion has low potential for pre-contact and/or early historic native or European archaeological resources (CRM 2016). The area was not settled by Europeans until late in the 17th century and not intensely settled until more recently, and then generally along travel routes. The quarry is set back from the Bay St. Lawrence Road, and the adjacent land has not been used for agriculture and likely was used only for resource removal such as logging, trapping and hunting. If an archaeological feature of significance is encountered during quarry activities, particularly evidence of Mi'kmaq occupation, the effects can be reduced by halting operations and consult with experts in the field to ensure the artifact or feature is not disturbed, and is adequately documented and preserved.

5.3.6 ECONOMY, LAND USE AND VALUE

Hunting and trapping, marine fisheries, tourism, as well as rural-residential activities, are the major economic activities in the vicinity of the site and the study area as a whole. The land on the site is not

suitable for agriculture or subsurface mining, and aggregate production is among the only potential commercial uses of the area. Land in the area is, however, also designated for conservation and wildlife management (i.e. Polletts Cove – Aspy Fault Wilderness Area; Cape Breton Highlands National Park) and as well contains habitat for valued species such as moose, which support hunting—an important activity for locals, visitors and Mi'kmaq alike. The expanded quarry will remove only a small fraction of available land for these purposes in the area, and therefore won't have a significant impact on these uses. Areas not required for the quarry will be preserved if possible to assist in maintaining forest ecosystems for wildlife, and to buffer adjacent areas from quarry activities. Quarry activities are also not expected to impact existing residential, industrial or conservation and scientific use of nearby areas. As the quarry has been in operation between 20 and 25 years, and the scope and frequency of activities are not expected to change from past use, residential property values in the area are not expected to change significantly. The existing quarry has been operating at the site with little to no impact, while providing economic development and a source of aggregate for local construction projects.

5.3.7 TRANSPORTATION

The quarry generates a low level of truck traffic on highways in the area, but activity levels are not expected to increase significantly, and consequently the quarry is not expected to change the existing traffic volumes significantly. Suitable signage for truck and equipment operators, as well as the surrounding communities, would help avoid dangerous situations at the intersection of Bay St. Lawrence Road and 6014 Road. Parts of the 6014 Road to the quarry are steep and circuitous, and the road is used by both quarry operators and locals, as well as tourists, who operate vehicles ranging from ATVs to SUVs and heavy trucks. Safe use of the road and avoidance of accidents is essential, both for human impacts and the potential impacts of vehicle accidents and spills on the local watercourses and environments. Warning signs and speed limits can be placed in areas leading to the quarry, in particular when the quarry is operating, to improve safety. Equipment and truck operators for the quarry can be given instruction on safe and environmentally acceptable procedures. With suitable foresight and care, overall the impact of the project on transportation and safety is expected to be minimal.

5.3.8 RESIDENTIAL USE

Quarry activities can potentially interfere with normal use and enjoyment of nearby residential properties by creating background noise, and through truck and equipment traffic, which some residents may find objectionable. The property is located approximately one kilometer from the Bay St. Lawrence Road, and is not visible. Noise from routine operations in the quarry would not normally disturb residents living nearby; truck movements along the 6014 Road and Bay St. Lawrence Road are responsible, however, for periodic elevated noise and dust levels. Control of vehicle speed, engine braking, securing equipment to prevent banging (e.g. doors and chains), covering loads, etc. would normally mitigate such effects. Normal traffic noise on Bay St. Lawrence Road would likely exceed any noise coming from the quarry for homes located nearby. Residents of homes along Bay St. Lawrence Road in the vicinity of the quarry when interviewed, have pointed out some of these issues associated with quarry operations. Activities at the quarry would be limited in time seasonally (approximately March to November) and during the day,

although nighttime operations, but not blasting, will be required under some circumstances. Traffic volumes from the site would be moderate, and a high frequency of truck traffic would be an irregular occurrence, depending on the supply requirements for particular projects. Dust from operations is unlikely to reach residential areas. Dust generation could be moderate due to exceptionally high winds and the exposed high elevation of the site, but measures to control dust will be implemented and the adjoining forest areas would act as a buffer between the quarry and offsite receptors. Quarry activities such as blasting, are not expected to impact residential water supplies, as homes are located at a significant distance from the site, but a monitoring program for water supplies could be implemented to ensure changes, if any, suspected to be due to the quarry, are detected. Most operations at the site occur during daylight hours. On rare circumstances when they are undertaken at night, activities will involve minimal additional lighting and noise, and is unlikely to be a serious disturbance to local residents. The quarry will include signage with phone numbers and contact persons should any members of the community wish to register complaints or concerns. A complaint resolution procedure will be put in place by Dexter Construction Company Limited to address complaints and concerns.

5.3.9 COMMERCIAL/INDUSTRIAL USE

With the exception of the CBC FM transmitter located adjacent the site, there are no commercial operations near the quarry which could be affected, and only a shop and garage associated with a telephone company on the Bay St. Lawrence Road. Businesses in St. Margaret Village and Bay St. Lawrence would be unlikely to see any effects. The television antenna has been functioning through development of the quarry to its current state, and the quarry is expanding away from the antenna, leading to less potential for effects. The quarry contributes to net economic benefit in the community through supporting local trucking operations and providing access to aggregate and other quarry products.

5.3.10 WATER SUPPLIES AND RESIDENTIAL WELLS

Nearby residents use spring fed water sources and dug surface wells for potable water supply, and a candidate water supply well, drilled recently by Victoria County, is also located near the base of the mountain along 6014 Road. Dexter will implement a groundwater monitoring program and will respond as necessary to input from local residents and the Municipality to ensure water quality and supply is maintained. Groundwater recharge generated by the quarry is likely to be of high quality (low conductivity and dissolved solids and neutral in pH). Additionally, best management practices for operations will be implemented to mitigate potential impact of aquifers at the site.

5.3.11 PARKS AND PROTECTED AREAS

The Money Point quarry site is not expected to be visible by tourists traveling from the main National (Cape Breton Highlands) and Provincial Parks (Cabot's Landing Provincial Park), and road traffic activity due to the quarry is not expected to be high enough in volume to disrupt tourist traffic. Occasional blasting may be heard in Cabot's Landing Provincial Park, but occurrences are likely to be brief, and distant, and not likely to be a significant concern to visitors/users of those areas. The quarry is adjacent to a Canada Lynx management area, and the species may from time to time visit the site, although the area of land

occupied by the quarry represents only a small proportion of land in the area available to Lynx. The quarry will be restored at the end of its useful life. The Money Point quarry is not located in the Pollets Brook – Aspy Fault Wilderness area located west of the site, and expansion of the quarry will not affect its integrity. The quarry is, however, inside the Cape North-Money Point Important Bird Area, which contains habitat for several species of conservation concern, including Bicknell's Thrush and Boreal Owl. Noise levels, and the potential effect of noise on birds, will not be increasing over that which has occurred in past. Expansion of the quarry will result in only a small change in the amount of softwood and mixed forest at the site, and therefore is likely to have a negligible potential impact on Boreal Owl. A small area identified as having stunted forest, on the northwest side of the quarry, is ideal nesting habitat for Bicknell's Thrush. In developing the site to include this area, a breeding bird survey, focused on Bicknell's Thrush, should be conducted in advance to ensure nesting habitat is not disturbed.

5.3.12 RESOURCE USE—FORESTRY, HUNTING & TRAPPING

Use of the land for a quarry will remove the potential for logging the site, at least until after the quarry is closed and rehabilitated in future; however the area occupied by the quarry is relatively small in relation to the available forest resources in the area, timber harvesting is not a big industry in the area, and the overall impact on economic return is expected to be small. The quarry will occupy a relatively small area of habitat for furbearing and game species, and will not have a significant impact on hunting and trapping, and in particular on Moose populations, in the Bay St. Lawrence area.

5.4 BIOPHYSICAL IMPACTS—IMPACTS OF THE PROJECT ON THE ENVIRONMENT

5.4.1 AIR QUALITY, NOISE, AND LIGHT

Quarry activities are not expected to change from the previous scope of operations, however various project activities have the potential to generate dust, combustion emissions, noise, and light. In particular, operation of heavy equipment (e.g. earth movers, crushers), rock drilling and blasting, operation of an asphalt plant, as well as onsite routine operations contribute to increased dust and particulate levels. Noise levels can impact human use and enjoyment of the environment. Dust emissions during the construction phase will be localized and short term, and are expected to be minimal from routine operations. Dust management will be undertaken, including use of water spray and covering working and laydown areas with blasted rock. Monitoring of airborne particulate emissions will be conducted at the request of NSE and in accordance with the Pit and Quarry Guidelines and the Nova Scotia Air Quality Regulations. Industry standards and best practices will be followed during all phases of operations.

Exhaust emissions will be generated by the operation of vehicles and equipment. An asphalt plant may generate air-borne odours that can be detected at a distance from the site; however prevailing winds are generally from the southwest to northwest and the general direction of travel of such emissions would be into unpopulated areas and offshore. Given the scope of the planned operations, these emissions will be minimal (i.e. restricted to several pieces of heavy equipment, earth movers, trucks etc. as well as operation of crushers and asphalt plant), and will be localized and similar in type and amount to those

produced during previous operations. Ambient air quality monitoring may be conducted at the request of NSE.

Noise levels from the expanded quarry are expected to be similar to those already produced at the site, since the operations are expected to be similar in size at a given time. The operator should ensure that they do not exceed those specified in the Nova Scotia Pit and Quarry Guidelines. Blasting is expected to occur infrequently (1-2 times per year).

Light during nighttime operations— particularly during times of low-hanging cloud and fog—can attract migrating birds traveling over water towards the rest of the mainland of Nova Scotia. Measures can be taken to ensure use of directional lighting, which minimizes emanation of light upward and laterally over the horizon.

5.4.2 GROUNDWATER

Activities associated with the project including forest clearing, grubbing and removal of overburden, and blasting, influence groundwater flow locally in the vicinity of the quarry, but are not expected to influence groundwater aquifers in adjacent areas (i.e. on adjacent mountains or ridges). The amount of recharge area involved in project activities is moderate in relation to the overall size of the aquifers in the general vicinity; however the quarry floor will continue to add recharge in approximately the same amount as at present, although the response time in influencing groundwater flow would be shorter and the flows would be more sudden; overall, the effect on overall groundwater flow patterns will be negligible.

5.4.3 HYDROLOGY

Expansion of the quarry will result in an artificial and managed regime of surface water movement and runoff at the site, but mainly precipitation will enter the water table through the quarry floor, and therefore not have a substantial impact on local springs and groundwater. Runoff from the quarry will be managed to ensure that it meets acceptable environmental standards. Exposed surfaces on the quarry and on the access road (6014 Road) lead to more sudden, 'flashy' runoff patterns during rainfall events; this has resulted in deepened ditches along the road, and deep-cutting of ravines, as well as increasing temporary flows in watercourses, downslope from the road. The steep slopes along the 6014 Road will not likely allow room for more flow management; however additional culverts and water diversions off the road surfaces would help reduce erosion. Dexter will maintain the flow management system in place and continue to manage the flow in a natural way and minimize damage to the local landscape.

5.4.4 WATER QUALITY

Water quality downslope of the site is important for fish habitat in the unnamed stream that runs along Bay St. Lawrence Road and for spring-fed water supplies for residents in the area. Quality of water leaving the site and entering groundwater is high, due both to the onsite management and the low-contaminant characteristics of the bedrock. Quarry rock is within acceptable limits for sulphur and acid-generating potential. Blasting is not expected to result in groundwater quality changes, particularly with efforts to

reduce releases of other chemicals such as nitrates used in blasting. Forest clearing and grubbing activities can lead to releases of fines from the soil, resulting locally in elevated suspended sediment levels but no flow is expected off the site and sediments may settle out before the water enters groundwater. Release of other contaminants such as oils and lubricants from operating equipment, as well as contaminants which may be found in material, such as recycled asphalt, which may be stored at the site, is expected to be mitigated by normal precautions on equipment operations and fuelling locations. Contaminants arising from operations of the quarry are expected to be exceedingly low. All activities will conform to the Nova Scotia Erosion and Sedimentation Control Handbook (NSE 1988) and the Nova Scotia Pit & Quarry Guidelines (NSE 1999). Runoff from road surfaces potentially can lead to elevated suspended sediment levels in flows running down ravines to streams such as the unnamed stream along Bay St. Lawrence Road, although effects would be short term, and the stream would naturally be exposed to short term episodes of suspended sediment. Impact of the quarry on water quality in adjacent streams and other waters is expected to be negligible.

5.4.5 FRESHWATER AQUATIC ENVIRONMENTS

The only permanent streams at the site are located outside of the study area to the west along Bay St. Lawrence Road, and several steeply sloping watercourses on the east and south flowing to the ocean. There are no ponds or wetlands at the site. Presently some runoff from the quarry flows along road ditches and surfaces near the quarry entrance, but otherwise is managed on site. Quantities of runoff arising from the site in future will be approximately the same as at present, and will remain in the same watershed. The quarry is unlikely to generate significant quantities of contaminants or suspended sediments that could impact any freshwater habitat.

5.4.6 TERRESTRIAL ENVIRONMENTS

Proposed expansion will utilize areas which are mainly medium-aged softwood and mixed forest—types which are common in the general vicinity, and in particular locally at the site—and the quarry will not remove a large proportion of either type. Land at the quarry will be reclaimed and revegetated, will eventually return to a functioning ecosystem, possibly similar to that which occurs at the site at present.

5.4.7 FISH AND FISH HABITAT

None of the proposed project activities will physically impact potentially fish bearing streams Blasting occurs infrequently at the site and is sufficiently separated in distance from the unnamed stream along Bay St. Lawrence Road, to eliminate any harm to fish. Water quality typically found in runoff from the quarry will be monitored and is expected to meet guidelines for maintenance of Freshwater Aquatic Life. All guidelines for activities and timing of blasting in the quarry will be followed. Overall the effects of the quarry construction and operations are expected to be negligible.

5.4.8 FLORA AND FAUNA AND HABITAT

The existing terrestrial ecosystem (plants and animals) will be removed in areas covered by the footprint of the quarry. With time, areas no longer suitable for quarry operations will be remediated, according to agreements made with the Nova Scotia government as a condition of quarry approval. Plant and animal communities that arise in remediated areas will likely differ to some degree from those at present; however a goal of remediation will be to ensure that conditions (e.g. soil types and topography) are reasonably restored to pre-existing conditions. During recovery and revegetation of abandoned areas, the forest succession will provide habitat for a moderate diversity of species. Removal of forest cover is a feature that quarry development shares with logging activities, which affects local ecosystems to a moderate degree, and is allowed in Nova Scotia. Areas of the site confirmed via survey to support Bicknell's Thrush (the area of stunted forest on the slope on the northwest side of the quarry site) will be avoided. No other species of conservation concern were highlighted which were in the proposed expansion area or areas immediately adjacent. Normal management practices regarding forest clearing, such as avoidance of critical breeding periods from mid- April to September, will reduce loss of nesting birds in forest areas. Several species of migratory birds are in decline in Nova Scotia, in particular interior forest birds, which rely on large expanses and continuity of intact forest. Other wildlife species need large areas of undisturbed forest to live and reproduce naturally. Expansion of the Money Point Quarry will result in only a comparatively small change in the coverage of natural and mature forest stands in the area and is expected to have comparatively small impact on interior forest birds and wildlife. During operations, modified areas of the quarry offer potential nesting sites for certain species of birds and other wildlife, including hunting spaces for species such as owls and nesting for ground nesting birds such as nighthawks, for example in currently existing revegetated areas (Figure 16); quarry employees should be educated on the need to check areas for activity and nests before undertaking activities which would disturb established surfaces. Night operations and use of lights have various effects, including attracting insects which otherwise would need darkness to mate and reproduce; light pollution is considered to be an important factor globally in decline of songbird populations, through declines in populations of some insects. Night operation lighting during migration periods (August-September) would attract migrating birds. Lighting used at the site should focus downward and below the normal horizon, to limit visibility by birds and insects from a distance.

5.4.9 SPECIES AT RISK

No species at risk were found at the site, although the stunted forest on the northwest slope of the site has the potential to support a rare Bicknell's Thrush, and Boreal Owl can occur in the area. Common Nighthawk, a ground-nesting endangered bird species, potentially could nest in grubbed and marginal but open areas of the quarry; employees should be made aware of the need to check areas for activity and nests before undertaking activities which would disturb established surfaces. Lights during night operations during migration periods (May-June, August-September) would attract various bird species and insects, which could include species at risk. Lighting used at the site should focus downward and below the normal horizon, to limit visibility from a distance.

5.4.10 NATURAL AREAS & WILDERNESS

Natural areas at the site are appreciated by locals and tourists alike, and the Bay St. Lawrence area is dominated by natural areas, including some of the most remote and wild areas of Nova Scotia. The pockets of human development along the Bay St. Lawrence Road, around the harbour at Bay. St Lawrence, and along the coast of the Gulf of St. Lawrence to Meat Cove, contrast with the wilderness areas in the Pollets Cove – Aspy Bay Fault Wilderness area to the west and the Cape Breton Highlands National Park located to the south. The Money Point Quarry is close enough to St. Margaret Village and Bay St. Lawrence to be considered part of the local development core, and is located along a road which leads to other human developments such as telecommunications towers, and hiking trails. The quarry affects a small proportion of the natural landscape at the site, and has a limited effect on visitors to the site who are looking for Nature experiences. Efforts shall be made to minimize the effects of the quarry, in particular to reduce traffic, noise, dust and light from operations. Restoration should also consider values important in conservation of biological communities and ecosystems, as well as changes in physical conditions that could affect those communities. Normal procedures such as dust control and light management will help to minimize impacts on natural and wilderness values at the site.

6 IMPACTS OF THE ENVIRONMENT ON THE PROJECT

The operating quarry will not be impacted in general by weather, including high rainfall and precipitation, through its nature and design, which includes site water management. Aggregate and other rock products stored at the site are stable under varying conditions of rainfall and wind. Integrity of any runoff management structures at the site must be maintained and appropriately designed to remove the possibility of catastrophic failure. Changing climate may increase the operating season for transportation projects, and the need for aggregates produced by the quarry.

7 CUMULATIVE EFFECTS

All the potential impacts of the quarry operation (dust, noise, lights, blasting, traffic volume) may be compounded by the presence of development in the nearby St. Margaret Bay and Bay St. Lawrence communities and use of the 6014 Road for various activities, both recreational and commercial; however since site operations are not expected to increase in frequency or scope from past use, the cumulative effect is not expected to increase from past levels.

Table 8. Potential interactions between project activities and operations and Valued Environmental Components (VECs) for Money Point Quarry expansion.

General Category of VEC	Biophysical									Socioeconomic										
Project Component (potential interactions shown by ✓)	Air Quality, Noise and Light	Groundwater & Hydrology	Water Quality	Freshwater Aquatic Environments	Terrestrial Environments	Natural Areas & Wilderness	Fish and Fish Habitat	Flora & Fauna Species & Habitat	Species at Risk	Mi'kmaq	Cultural/Historical	Recreation, Tourism & Viewscape	Residential Use	Recreational, Commercial & Mi'kmaq Fishing	Water Supplies/ Residential Wells	Economy, Land Use, and Value	Transportation	Commercial /Industrial Use	Parks & Protected Areas	Forestry Hunting /Trapping
Construction																				
Site Acquisition, Use/Removal of Resources	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓
Site Clearing/Grubbing	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓				✓	✓
Drilling	✓	✓				✓			✓			✓	✓		✓				✓	
Blasting	✓	✓	✓	✓		✓	✓	✓	✓			✓	✓		✓				✓	
Lights & Noise	✓					✓		✓	✓			✓	✓						✓	
Operation																				
Moving/Transporting Rock and Product	✓					✓		✓				✓	✓			✓	✓	✓	✓	
Crushing	✓					✓						✓	✓						✓	
Washing		✓	✓	✓			✓													
Lights & Noise	✓					✓		✓	✓			✓	✓						✓	
Site Runoff Management		✓	✓	✓			✓							✓	✓					
Portable Asphalt Plant	✓					✓		✓				✓	✓						✓	
Onsite Materials Storage			✓	✓											✓					
Accidents (Fires/Oil & Fuel Spills)	✓	✓	✓	✓		✓	✓	✓				✓	✓		✓				✓	✓

Table 9. Summary of impacts and mitigation on Valued Environmental Components, Money Point Quarry Expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
BIOPHYSICAL COMPONENTS						
Air Quality, Noise & Light	Construction	Noise and dust from heavy equipment during site clearing and grubbing.	Significant	Negative	Take steps to reduce noise sources such as engine braking.	Not significant.
		Drilling and blasting.	Significant	Negative	Monitor noise levels and undertake to avoid exceedances of regulatory levels.	Not significant.
		Light from the quarry can be seen in neighbouring areas.	Significant	Negative	Use directional lighting with downward and lateral focus to minimize light leaving the quarry during night operations.	Not significant.
	Operation	Noise from drilling and blasting; crusher; heavy equipment operation; dust; air-borne emissions from asphalt plant.	Significant	Negative	Monitor noise levels and undertake to avoid exceedances of regulatory levels. Institute measures for dust control. Monitor and maintain asphalt plant to minimize emissions.	Not significant.
		Light from the quarry can be seen in neighbouring areas.	Significant	Negative	Use directional lighting with downward and lateral focus to minimize light leaving the quarry at night.	Not significant.
Groundwater/ Hydrology	Construction	Forest and soil removal changes surface and ground water flow levels and patterns.	Negligible	Negative	Use site runoff management to minimize impacts. Likely changes in groundwater and runoff patterns will be small.	Not significant.
	Operation	Blasting fractures bedrock, disturbs till, and changes	Significant	Negative	Drilled wells in bedrock and surface wells can be disturbed. Monitor	Not significant.

Table 9. Summary of impacts and mitigation on Valued Environmental Components, Money Point Quarry Expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
		groundwater flow patterns.			groundwater quality and movement to determine changes.	
	Operation	Quarry and work areas change surface water flows. Increased peak stormwater flows. Washing product creates silt-laden surface flows.	Significant	Negative	Onsite water management to moderate extreme surface water runoff and suspended sediment levels; measures to maintain normal flow regime.	Not significant.
	Operation	Accidental hydrocarbon spills and blasting residues contaminate groundwater.	Significant	Negative	Measures to minimize danger of spills; onsite emergency numbers, spill kits etc. Avoid refueling near watercourses.	Not significant.
Water Quality	Construction	Altered surface water flows and turbidity in watershed flowages from site runoff.	Negligible	Negative	Erosion and sedimentation controls in work areas. Onsite water management to moderate surface water runoff and suspended sediment levels.	Not significant.
	Operation	Dust & suspended sediment from operations potentially enters local watershed. Chemicals (e.g. nitrates) from explosives entering runoff.	Significant	Negative	Onsite dust control and water management to moderate surface water runoff and suspended sediment levels. Erosion & sedimentation controls. Closely monitor chemical residues after blasting.	Not significant.
	Operation	Water chemistry changes in runoff from materials stored on site.	Negligible	Negative	Best management practice allows leaving piles exposed to the environment. Monitor settling ponds; storm-	Not significant.

Table 9. Summary of impacts and mitigation on Valued Environmental Components, Money Point Quarry Expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
					water management.	
Natural Areas & Wilderness	Construction & Operation	Presence of quarry, emissions, dust etc, detracts from public perception of wild quality of area. Site is technically not far removed from civilization and is not wilderness.	Negligible	Negative	Area affected is small in relation to remaining natural areas, and previous development has occurred in the area, diminishing value of natural areas and wilderness. Attempt to minimize footprint and avoid damage to areas that contribute most to supporting the natural ecosystem and enhancing values. Manage releases of dust and light, and control noise.	Not significant.
Freshwater Aquatic Environments	Construction	Potential for local high suspended sediments and nutrient levels from grubbings, road construction, and locally diverted flows.	Negligible	Negative	Preserve wooded buffer areas for quarry. Onsite water management and sedimentation controls to moderate surface water runoff and suspended sediment levels.	Not significant.
	Operation	Surface runoff with dust, nutrients and contaminants. Residues from aggregate washing. Reduced water availability from evaporation from pit floor and exposed surfaces.	Negligible	Negative	Maintain forested buffers. Onsite water management. Sedimentation ponds and storage wash water during off peak season. Minimize unvegetated areas.	Not significant.
	Operation	Higher peak flows and suspended	Significant	Negative	Onsite water management to store wash water	Not significant.

Table 9. Summary of impacts and mitigation on Valued Environmental Components, Money Point Quarry Expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
		sediment during activities.			during off peak season. Preserve woodland in buffer areas of quarry.	
	Operation	Runoff from 6014 Road.	Significant	Negative	Advise provincial authorities of maintenance needs.	Not significant.
	Operation	Releases of chemicals from blasting and runoff from materials stored on site.	Negligible	Negative	Isolate and treat runoff from work areas and stored materials piles.	Not significant.
	Construction & Operation	Routine releases and accidental spills of hydro-carbons on site.	Significant	Negative	Provide pollution prevention and emergency measures.	Not significant.
Terrestrial Environments	Construction	Grubbing, road construction, pit preparation. Potential damage to unique stunted forest ecosystem, and associated species.	Significant	Negative	Maintain property boundary buffers. Conduct species specific breeding bird survey of stunted forest ecosystem northwest part the property prior to excavation. Monitor species-at-risk birds.	Not significant.
	Operation	Dust, nutrient inputs from runoff, changes to environment and functioning of forest communities.	Negligible	Negative	Maintain property boundary buffers. Conduct species specific breeding bird survey of stunted forest ecosystem northwest part the property prior to excavation. Be aware of critical times for rare species which might occur there.	Not significant.
Fish & Fish Habitat	Construction	Change runoff patterns at site in local and adjacent watersheds.	Negligible	Negative	Runoff management from 6014 Road and from quarry entrance, to avoid	Not significant.

Table 9. Summary of impacts and mitigation on Valued Environmental Components, Money Point Quarry Expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
					sudden runoff events.	
	Operation	Site runoff management and water use affects hydrological and groundwater regime.	Negligible	Negative	Ensure the runoff from the site is managed to avoid sudden runoff events.	Not significant.
	Construction & Operation	Small releases of oils, hydraulic fluids etc. from operating equipment. Accidental spills of hydrocarbons on site.	Negligible	Negative	Maintain equipment to minimize loss of lubricants and fuels. Provide pollution prevention and emergency measures.	Not significant.
	Operation	Accidental spills into watercourses due to vehicle accidents on roads in area.	Negligible	Negative	Recommend safe driving practices for truckers and staff and reduce speed in vicinity of quarry and intersection on Bay St. Lawrence Road. Provide pollution prevention and emergency measures.	Not significant.
Terrestrial Flora & Fauna & Habitat	Construction	Removal of Existing Forest Communities	Negligible	Negative	Restore damaged and unused parts of the site (e.g. grubbings and waste rock piles) as soon as possible. Long-term site rehabilitation plan developed with NSE. Cut forest short term only as needed to expand quarry. Conduct species specific breeding bird survey of stunted forest ecosystem northwest part the	Not significant.

Table 9. Summary of impacts and mitigation on Valued Environmental Components, Money Point Quarry Expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
					property prior to excavation.	
	Construction & Operation	Accidental contaminant releases, contamination of habitat.	Significant	Negative	Provide pollution prevention and emergency measures & response capability. Remediate areas affected by spills.	Not significant.
		Artificial light from operations influences movements of birds and insects.	Significant	Negative	Use directional lighting with downward focus to minimize light leaving the quarry.	Not significant.
		Removal of potential forest and wildlife resource (i.e. wildlife habitat)	Negligible	Negative	Small area affected relative to total available. Minimize footprint of quarry. Restore and rehabilitate areas not used. Leave mature standing trees where possible as nest cavities.	Not significant.
		Quarry affects wildlife movement patterns and connectivity of habitats.	Significant	Negative.	Restoration should include consideration for wildlife movement through the restored site.	Not significant.
Species at Risk	Construction	Bicknell's Thrush potentially occurring in stunted forest at edge of site. Lynx may visit site.	Significant	Negative	Survey for additional occurrences of species. Develop management plan. Report sightings of Lynx. Minimize footprint and maintain as much natural (uncut) natural vegetation as possible. Avoid stunted forest area.	Not significant.
	Operation	Sound from blasting can harm bats and birds.	Negligible	Negative	Minimize blasting activity and concentrate in spring and fall	Not significant.

Table 9. Summary of impacts and mitigation on Valued Environmental Components, Money Point Quarry Expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
					(outside breeding and migratory periods) when species are absent.	
		Light influences movements of species at risk birds migrating overland.	Significant	Negative	Use directional lighting with downward and lateral focus to minimize light leaving the quarry.	Not significant.
		Open and revegetated areas and grubbings piles may be occupied by nesting species such as nighthawks.	Significant	Negative	Educate personnel to look for bird life prior to activities; periodically conduct nesting bird survey at site to identify bird issues.	Not significant.
SOCIOECONOMIC COMPONENTS						
Mi'kmaq	Construction and Operation	Any land use conflicts with Mi'kmaq Right to Use Land	Significant	Neutral	Consult with Mi'kmaq in developing quarry.	Not significant.
		Contamination and alteration of flow regime of streams may affect fish populations potentially used by Mi'kmaq.	Negligible	Negative	Employ surface water monitoring program. Use Best Management Practices for quarries. Avoid accidental releases of contaminants. Avoid vehicle accidents.	Not significant.
Archaeological, Cultural and Historical Significance	Construction	Expansion may affect undiscovered artifacts.	Not significant	Negligible	Unlikely that artifacts occur at site. Stop work and report discoveries. Minimize project footprint.	Not significant.
Recreation	Construction & Operation	Quarry traffic & activities affects local light recreation (e.g. walking, hiking, ATV use).	Not significant	Negative	Users will be aware of activity at quarry but will not be otherwise impacted by it. Signage of truck use, dangers, and quarry activity.	Not significant.
Tourism and Viewscape	Construction & Operation	Presence of quarry affects	Negligible	Negative	Quarry cannot be seen from a	Not significant.

Table 9. Summary of impacts and mitigation on Valued Environmental Components, Money Point Quarry Expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
		public perception of wilderness values.			distance. Dust & noise control. Maintain a clean operation. Rehabilitate areas no longer needed for activity and future development.	
Residential Use	Construction & Operation	Noise; light pollution; dust; odours; operation of trucks and transportation of heavy equipment.	Significant	Negative	Use best management practices to reduce disturbance to nearby residents. Inform residents about quarry operations. Provide community with safety information for truck traffic and quarry operations.	Not significant.
Recreational and Mi'kmaq Hunting and Fishing	Construction & Operation	Accidental hydrocarbon spills and blasting residues contaminate surface waters.	Negligible	Negative	Not an important local activity. Provide pollution prevention, emergency measures & response capability. Identify and control contaminant releases.	Not significant.
	Construction	Loss of forested area under quarry footprint.	Not significant	Negative	Rehabilitate areas no longer needed for activity and future development. Minimize cutting outside quarry footprint.	Not significant.
Water Supplies & Residential Wells	Construction and Operation	Blasting potentially impacts local aquifers.	Significant	Negative	Develop groundwater-monitoring plan in consultation with NSE. Monitor local wells.	Not significant.
Economy, Land Use and Value	Construction & Operation	Removal of potential forest and wildlife resource (e.g.	Not significant	Negative	Small area affected relative to total land available. Minimize footprint	Not significant.

Table 9. Summary of impacts and mitigation on Valued Environmental Components, Money Point Quarry Expansion.

VEC	Project Component	Nature of Effect	Significance	Nature of Impact	Mitigation	Significance after Mitigation
		forestry & trapping).			of quarry. Restore and rehabilitate areas not used.	
Transportation	Operation	Wear on highway	Negligible	Negative	Current levels low and will not increase.	Not significant.
	Operation	Collisions with trucks and equipment on Bay St. Lawrence Road.	Not significant	No Change	Use good signage, have speed policy in vicinity of quarry. Safety training for truck drivers.	Not significant
Industrial & Commercial Use	Operation	Operations of TV Transmitter	Negligible	Neutral	Quarry helps to maintain access roads to site; cooperate if possible.	Not significant.
Resource Use Forestry, Hunting & Trapping	Construction & Operation	Removes woodland; game habitat.	Not significant	Negative	Relatively small area is used. Minimize footprint.	Not significant.
Parks and Protected areas	Construction & Operation	Noise and blasting can be heard from Cabot's Landing Provincial Park.	Not significant	Neutral	Employ best management practices for all aspects of quarry operation, in particular control of noise, light, & dust.	Not significant.

8 MONITORING

In accordance with Pit and Quarry Guidelines under the NS Environmental Act and the Industrial Approval for the quarry site, Dexter will implement surface and groundwater monitoring programs to monitor hydrological conditions (e.g. runoff patterns and flows) as well as water quality. Routine monitoring of noise levels and particulate levels will be conducted in accordance with the site Industrial Approval.

9 PUBLIC CONSULTATION

Informing the public and Mi'kmaq about proposed industrial activities which potentially affect them is an important part of environmental and project management. Potential benefits include exposure to local knowledge, which may improve environmental performance, and overall operations of the project; and public involvement and support in subsequent operations. In addition to contacts already made in

developing this assessment and in conducting operations in the Bay St. Lawrence area, Dexter will be undertaking consultations with the local community through public notices, municipal and provincial government officials, and Mi'kmaq about the project and its implications; as well as the plans for using the resources at the site in an environmentally acceptable manner.

10 PERSONAL COMMUNICATIONS

Mr. Dave Anderson, Wildlife Biologist, NS Department of Natural Resources.

Mr. Robert Dauphinee, P. Eng, Public Works Manager, Municipality of Victoria County.

Mr. Sean Weseloh-McKeane, NS Museum of Natural History, Coordinator, Special Places.

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12 LIMITING CONDITIONS

The American Society for Testing and Materials Standards of Practice and the Canadian Standards Association state that no environmental assessment can wholly eliminate uncertainty regarding the recognition of potential environmental liabilities. The intent of the assessment is to reduce, but not eliminate, uncertainty regarding projects, giving reasonable limits of time and costs.

The conclusions of this report are based in part on the information provided by others, which is assumed to be correct. The potential exists that unexpected environmental conditions may be encountered at the site and with the project, not specifically investigated. Should this occur, the proponent and regulatory authorities must be notified so that we may decide if modifications to our conclusions are necessary.

The findings of this investigation are based on research and investigations carried out in September 2016-October 2017 and the generally accepted assessment practices of our industry. No other warranty is made.

APPENDIX A

MAPS

THE MUNICIPAL GROUP OF COMPANIES

MONEY POINT QUARRY EXPANSION

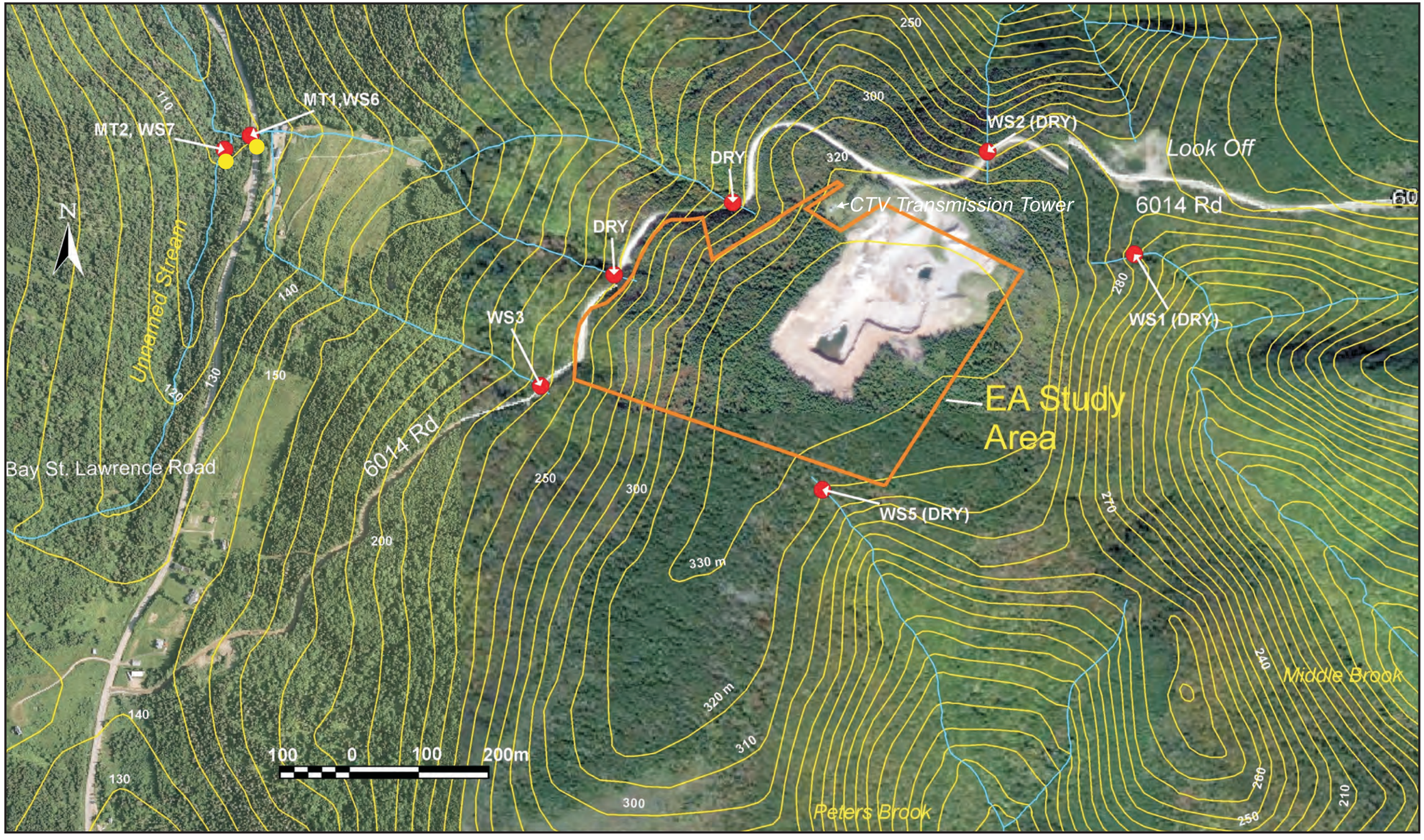
Bay St. Lawrence, Victoria County, Nova Scotia

Site Location

Study Area

Based on 1:50000 NTS Topographic Maps 11 N1, 11N2, 11K15 & 11K16.
Assembled by:
Envirosphere Consultants Ltd., Windsor, N.S.
August 2017

Map A-1



THE MUNICIPAL GROUP OF COMPANIES

DEXTER CONSTRUCTION COMPANY LTD.

MONEY POINT QUARRY EXPANSION
Victoria County, N.S.

Site Features

- Water Samples / Stream Reconnaissance
- Elevations (m)
- Surface Waters
- EA Study Area
- Minnow Trap

Map by:
Envirosphere Consultants Limited.
Windsor, Nova Scotia, October 2017

DEXTER
DEXTER CONSTRUCTION COMPANY LIMITED

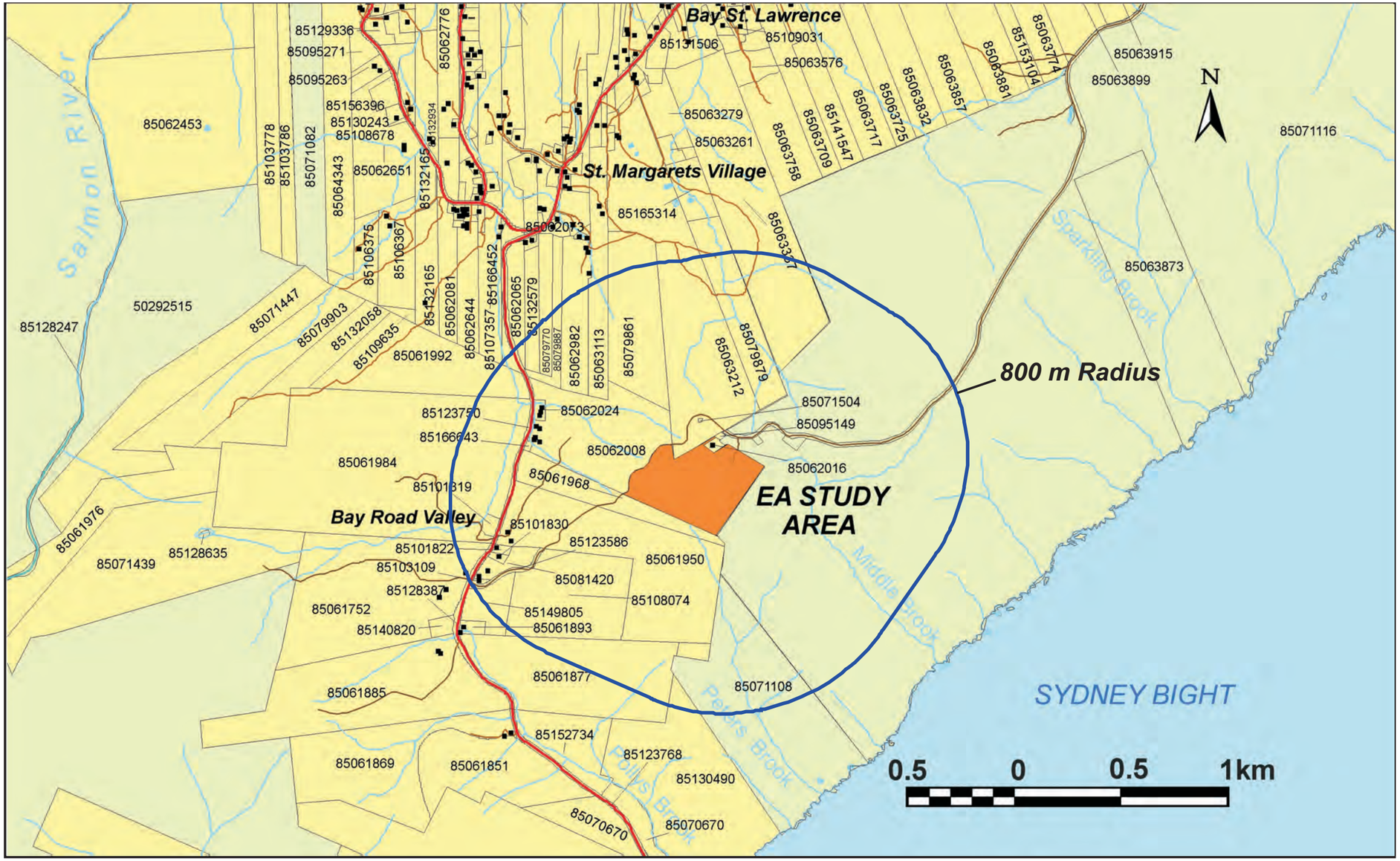
Map A-2

THE MUNICIPAL GROUP
OF COMPANIES

MONEY POINT QUARRY
EXPANSION

Bay St. Lawrence,
Victoria County, Nova Scotia

Property Ownership

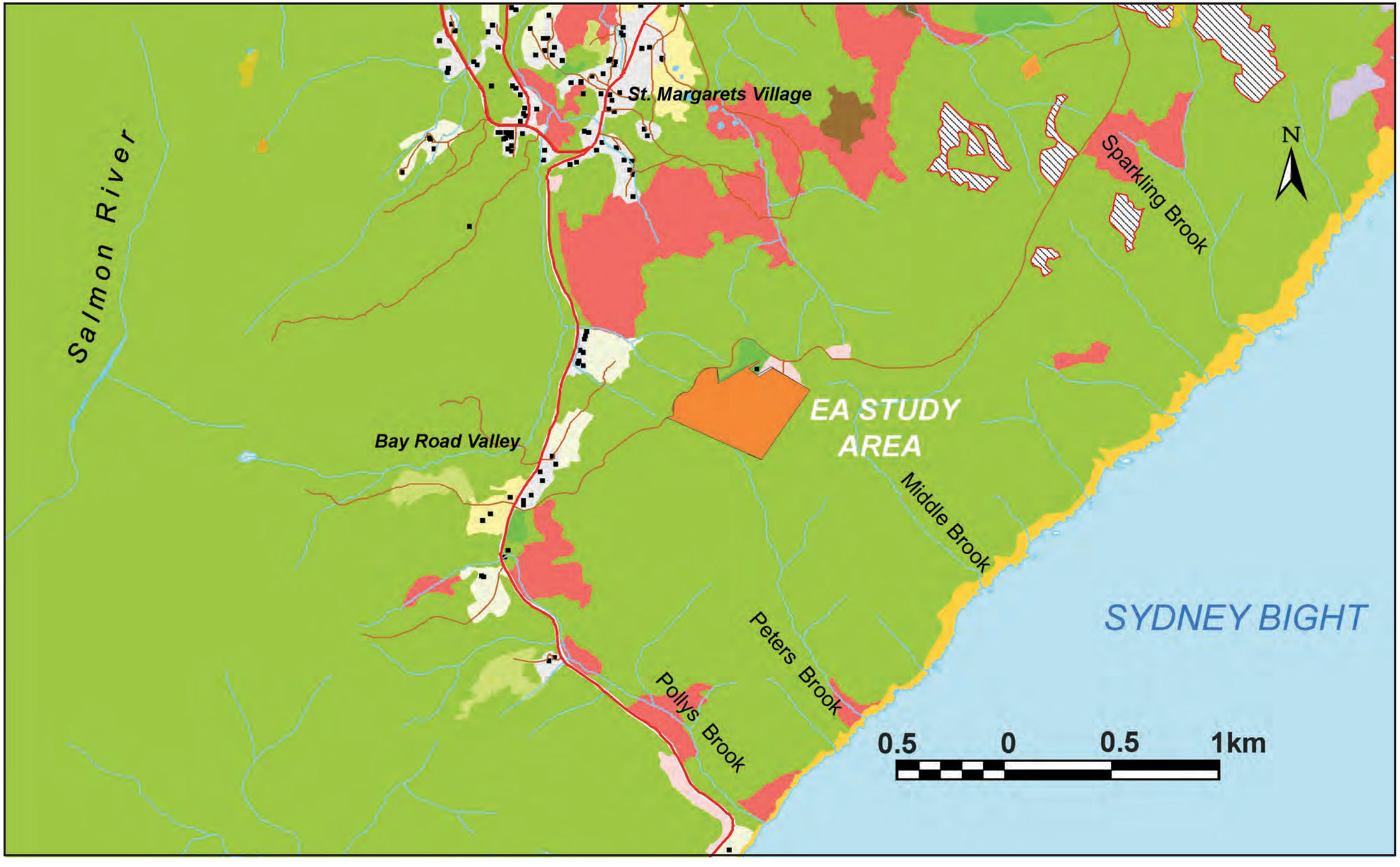


Study Area
Crown Land
Private Land
Buildings

Map by:
Envirosphere Consultants Limited
October 2017

DEXTER
DEXTER CONSTRUCTION COMPANY LIMITED

Map A-3



THE MUNICIPAL GROUP OF COMPANIES

DEXTER CONSTRUCTION COMPANY LTD.

MONEY POINT QUARRY EXPANSION
Victoria County, N.S.

Land Use Classification

(based on NS Forestry Inventory, 2016)

- Agriculture / Urban
- Old Field
- Moose Meadow
- Barren
- Brush
- Inland Water
- Natural Stand
- Gravel Pit
- Stand c/w Dead Trees
- Partial Depletion
- Treed Bog
- Cliffs
- Urban
- Clear Cut

- Trunk Highway
- Secondary Roads & Trails

Map by:
Envirosphere Consultants Limited.
Windsor, Nova Scotia, October 2017

DEXTER
DEXTER CONSTRUCTION COMPANY LIMITED

Map A-4

APPENDIX B

WETLAND/BOTANTICAL SURVEYS

Fall 2016 & Spring/Early Summer 2017

Botanical Survey for a Proposed Quarry Expansion at Money Point, Victoria County, Cape Breton Island, Nova Scotia

Ruth E. Newell, B.Sc. (Hons.), M.Sc.
November 31, 2016

Botanical Survey for a Proposed Quarry Expansion at Money Point, Victoria County, Cape Breton Island, Nova Scotia

Introduction

A vascular plant survey was conducted at the site of a proposed quarry expansion on Money Point Peninsula, Victoria County, Nova Scotia on October 15th, 2016.

The survey was conducted by botanist Ruth E. Newell, B.Sc. (Hons.), M.Sc.

The survey area (Fig. 1) is approximately 17.25 ha and occurs to the immediate west and south of the existing quarry. It is bounded on its west side by the 6014 Road. Woodland habitat occurs to the east and the south of the survey area.

Primary habitats present on site include: coniferous (C), mixed (M) and deciduous (D) woodlands with the latter woodland including a small gorge with a narrow stream. On the west side of the survey area there is an extensive section of exposed, moderately to steeply sloped terrain with stunted shrub and tree vegetation (S). This sloped area borders on the 6014 Road on its west side.

All vascular plants observed during this survey as well as the habitats in which they occur and their provincial status ranks are provided in TABLE 1. Information on these status ranks including status rank definitions can be found on the Atlantic Canada Conservation Data Centre (ACCDC) website (http://www.accdc.com/dl_files/Definitions.pdf and http://www.accdc.com/en/general-status.html). Status rank definitions are also provided in TABLE 1.

Figure 1. Satellite image of the existing quarry with the proposed expansion area delineated by the red line.

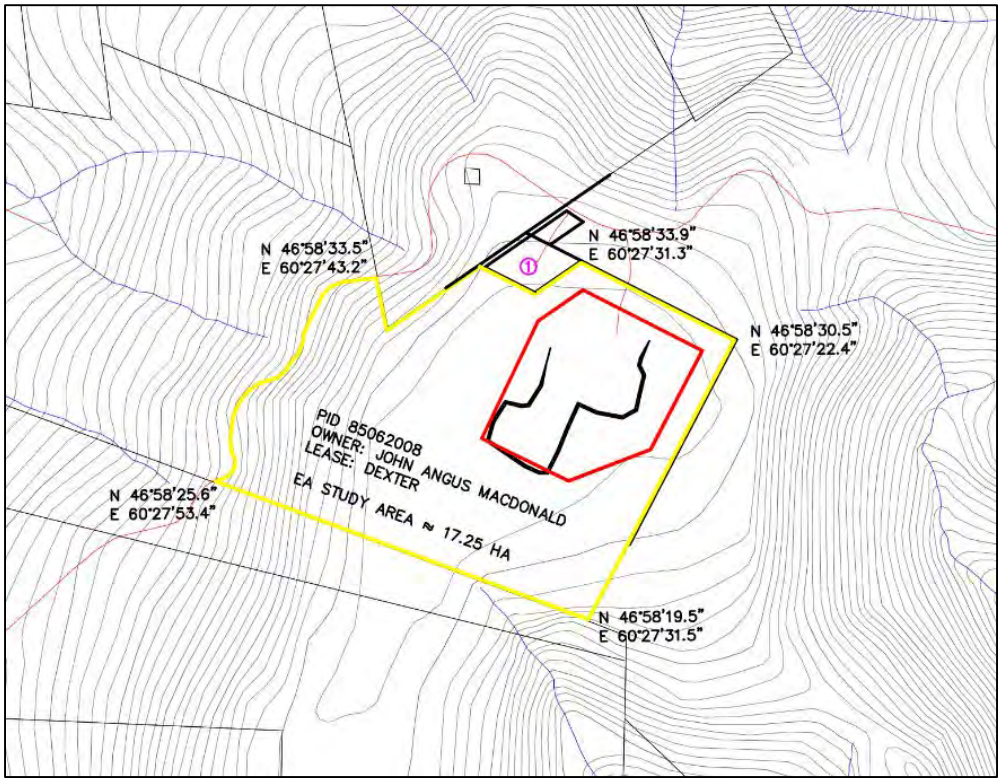


Figure 2. Topographic map of study area (area outlined in yellow). The existing quarry is outlined in red. The west side of the study area is steeply sloped downwards to the access road (6014 Road) (as indicated by the closely spaced contour lines).

Results

Habitat Descriptions

1) Coniferous Forest (C)

There was very limited primarily coniferous woodland within the survey area. Fig. 3 shows a small section of coniferous woodland just south of the existing quarry. Balsam Fir (*Abies balsamea*) is the dominant tree in this habitat. At this location, herbaceous vegetation was very sparse while mosses were quite common.

Species of conservation concern:

There were no species of conservation concern observed in this habitat during this survey.

Figure 3. Coniferous woodland to the south of the existing quarry. Balsam Fir (*Abies balsamea*) is the dominant tree species in the photo.

2) Mixed Forest (M)

Mixed woodland is the most common forest type present within the survey area. Common tree species present included Heart-leaved Birch (*Betula cordifolia*), Red Maple (*Acer rubrum*) and Balsam Fir (*Abies balsamea*). Less common tree species occurring in this habitat included Moose Maple (*Acer pensylvanicum*), Pin Cherry (Prunus pensylvanica) and Mountain Maple (*Acer spicatum*). Shrub species observed included Witherod (*Viburnum nudum* var. *cassinoides*), Northern Mountain-ash (*Sorbus decora*) and Wild Raspberry (*Rubus idaeus* ssp. *strigosus*).

Common herbaceous vascular plant species observed in this habitat included Bracken (*Pteridium aquilinum*), Wood Aster (*Oclemena acuminata*), Large-leaved Goldenrod (*Solidago macrophylla*), Wild Sarsaparilla (*Aralia nudicaulis*), Wild Lily-of-the valley (Maianthemum canadense), New York Fern (*Thelypteris noveboracensis*), Spinulose Woodfern (*Dryopteris carthusiana*) and Bunchberry (*Cornus canadensis*).

Species of conservation concern:

There were no species of conservation concern observed in this habitat during this survey.

Figure. 4. Mixed forest showing Heart-leaved Birch (*Betula cordifolia*) and Balsam Fir (*Abies balsamea*). Ferns are abundant on the forest floor.

3) **Deciduous Forest (D**)

A small area of deciduous woodland occurs in the southwest corner of the survey area. Birches, including Yellow Birch (*Betula alleghaniensis*) and Heart-leaved Birch (*Betula cordifolia*) and maples including Sugar Maple (*Acer saccharum*), Mountain Maple (*A. spicatum*) and Moose Maple (A. *pensylvanicum*), are dominant in this habitat. Herbaceous species present include Drooping Woodland Sedge (*Carex arctata*), Evergreen Woodfern (*Dryopteris intermedia*), Zigzag Goldenrod (Solidago flexicaulis), Large-leaved Goldenrod (*Solidago macrophylla*) and Braun's Holly Fern (*Polystichum braunii*). Alternate- leaved Dogwood (*Cornus alterniflolia*) is a scattered to common shrub.

Also occurring within this woodland is a narrow, steep-sided gorge through which a small stream flows in a more or less westerly direction (Fig. 5).

Species of conservation concern:

There were no species of conservation concern observed in this habitat during this survey.

Figure 5. Deciduous woodland and narrow gorge (with small stream)) located in the southwest corner of the survey area.

4) Exposed Slope (area of scrub vegetation) (S)

Along much of the west side of the survey area there is a moderate to steep northwest facing slope which extends downwards to the 6014 Road (Figs. 2, 6 & 7)). Much of the woody vegetation here is stunted or dead possibly due to wind exposure and/or other environmental factors. This area is more open than the previously described woodland habitats.

Common woody vegetation here includes Red Elderberry (*Sambucus racemosa* ssp. *pubens*), Bush Honeysuckle (*Diervilla lonicera*), Pin Cherry (*Prunus pensylvanica*), Beaked Hazelnut (*Corylus cornuta*), Balsam Fir (*Abies balsamea*), American Fly Honeysuckle (*Lonicera canadensis*) and Heart-leaved Birch (*Betula cordifolia*). Herbaceous vegetation present includes bracken (Pteridium aqulinum), Pearly Everlasting (*Anaphalis margaritacea*), Rough Goldenrod (*Solidago rugosa*), Wood Aster (*Oclemena acuminata*) and Evergreen Woodfern (*Dryopteris intermedia*).

Species of conservation concern:

There were no species of conservation concern observed in this habitat during this survey.

Figure 6. Exposed northwest facing slope on the west side of the proposed expansion area. Many trees are either stunted or dead in this area. The terrain at this location slopes steeply downwards and abuts onto the Money Point road (Road 6014). The shrubs in this photo are not dead but rather, have dropped their leaves prematurely possibly due to their exposed habitat.

Figure 7. A second photo of the steep, exposed, northwest facing slope on the west side of the Money Point quarry property. A number of dead trees can be seen in the photo.

Discussion

No species listed under either federal species-at-risk legislation or provincial species-at-risk- legislation were observed on the quarry property during this survey.

All species recorded during this current survey have a Nova Scotia general status rank of **GREEN** or **EXOTIC** with GREEN indicating a plant with a secure conservation status within the province, and EXOTIC meaning a species that is considered to be non-native to Nova Scotia. Atlantic Canada Conservation Data Centre subnational status ranks included S4, S5 and SNA also indicating that they are not species of conservation concern (S4 = **Apparently Secure** - Uncommon but not rare; some cause for long-term concern due to declines or other factors; S5 = **Secure** - Common, widespread, and abundant in the province; SNA = **Not Applicable** - A conservation status rank is not applicable because the species is not a suitable target for conservation activities).

As this survey was conducted in the fall season, it is highly recommended that a late spring/early summer survey be conducted as a follow up to the current study to ensure early flowering or fruiting plants are documented.

TABLE 1

List of all vascular plants observed on site, the habitats in which they occur and their status ranks. (Habitats: C = coniferous woodland, D = deciduous woodland, M = mixed woodland, S = exposed slope).

Latin Name	Common Name	General Status* Rank	ACCDC Status Rank**	Habitat(s)
Abies balsamea	Balsam Fir	GREEN	S5	C, M, S
Acer pensylvanicum	Moose Maple	GREEN	S5	C, D, M
Acer rubrum	Red Maple	GREEN	S5	C, M
Acer saccharum	Sugar Maple	GREEN	S5	D
Acer spicatum	Mountain Maple	GREEN	S5	D, M
Agrostis capillaris	Colonial Bentgrass	EXOTIC	SNA	M
Amelanchier sp. (non-flowering)	a shadbush	?	?	S
Anaphalis margaritacea	Pearly Everlasting	GREEN	S5	S
Aralia nudicaulis	Wild Sarsparilla	GREEN	S5	C, M
Betula cordifolia	Heart-leaved Birch	GREEN	S5	C, D, M
Betula alleghaniensis	Yellow Birch	GREEN	S5	D, M, S
Carex arctata	Drooping Woodland sedge	GREEN	S5	C, D, M

Latin Name	Common Name	General Status* Rank	ACCDC Status Rank**	Habitat(s)
Carex intumescens	Bladder Sedge	GREEN	S5	S
Carex novae-angliae	New England Sedge	GREEN	S5	C, M
Carex spp.	sedge species	-	-	C, D, M
Clintonia boreale	Clintonia	GREEN	S5	C, M
Cornus alternifolia	Alternate-leaved Dogwood	GREEN	S5	D
Cornus canadensis	Bunchberry	GREEN	S5	C, M, S
Corylus cornuta	Beaked Hazelnut	GREEN	S5	S
Diervilla lonicera	Bush Honeysuckle	GREEN	S5	S
Dryopteris carthusiana	Spinulose Wood Fern	GREEN	S5	C, M
Dryopteris intermedia	Evergreen Woodfern	GREEN	S5	D, S
Fragaria virginiana	Wild Strawberry	GREEN	S5	S
Linnaea borealis	Twinflower	GREEN	S5	C, M
Lonicera canadensis	Canada Fly Honeysuckle	GREEN	S5	S
Lycopodium annotinum	Bristly Clubmoss	GREEN	S5	M
Maianthemum canadense	Wild-Lily-of-the-Valley	GREEN	S5	C, M
Monotropa uniflora	Indian Pipe	GREEN	S5	S
Oclemena acuminata	Wood Aster	GREEN	S5	C, M, S
Osmunda cinnamomea	Cinnamon Fern	GREEN	S5	M
Oxalis montana	Wood Sorrel	GREEN	S5	C, M
Polystichum braunii	Braun's Holly Fern			D
Prunus pensylvanica	Pin Cherry	GREEN	S5	M, S
Pteridium aquilinum	Bracken	GREEN	S5	C, M, S
Ribes hirtellum	Gooseberry	GREEN	S5	S
Rubus idaeus ssp. *strigosus*	Wild Raspberry	GREEN	S5	C, M
Sambucus racemosa ssp. *pubens*	Red Elderberry	GREEN	S5	S
Solidago flexicaulis	ZIgzag Goldenrod	GREEN	S5	D

Latin Name	Common Name	General Status* Rank	ACCDC Status Rank**	Habitat(s)
Solidago macrophylla	Large-leaved Goldenrod	GREEN	S4	C, D, M
Solidago rugosa	Rough Goldenrod	GREEN	S5	S
Sorbus decora	Northern Mountin-ash	GREEN	S5	C, M
Thelypteris noveboracensis	New York Fern	GREEN	S5	C, M
Trientalis borealis	Starflower	GREEN	S5	C, M
Veronica officinalis	Common Speedwell	EXOTIC	SNA	S
Viburnum nudum var. *cassinoides*	Witherod	GREEN	S5	C, M
Viola selkirkii?	Selkirk's Violet	GREEN	S4	S

*The Nova Scotia general status ranks are based on the ranks used in the 2010 Wild Species of Canada Report (available at http://www.accdc.com/en/general-status.html; **GREEN = secure; EXOTIC = non-native**

ACCDC: Atlantic Canada Conservation Data Centre (http://www.accdc.com/); explanation of status ranks: S4 = **Apparently Secure - Uncommon but not rare; some cause for long-term concern due to declines or other factors; S5 = **Secure** - Common, widespread, and abundant in the province; SNA = **Not Applicable** - A conservation status rank is not applicable because the species is not a suitable target for conservation activities.

Botanical Survey for a Proposed Quarry Expansion at Money Point, Victoria County, Cape Breton Island, Nova Scotia (includes observations from both spring and fall surveys)

Ruth E. Newell, B.Sc. (Hons.), M.Sc.
September 30, 2017

Botanical Survey for a Proposed Quarry Expansion at Money Point, Victoria County, Nova Scotia (includes observations from both spring and fall surveys)

Introduction

A spring survey of vascular plants was conducted at the site of a proposed quarry expansion (Bay Saint Lawrence Quarry (Fig. 1) in vicinity of Money Point, Victoria County, Nova Scotia, on July 5th and 6th, 2017. A spring or early summer survey was recommended in a report stemming from an earlier survey conducted by botanist Ruth E. Newell, B.Sc. (Hons.), M.Sc. on October 15th, 2016. A spring survey was recommended for the purpose of documenting early flowering and fruiting plant species that would not be readily evident in October or would be more difficult to identify accurately late in the growing season. Observations from both surveys are included within this report. The spring survey was also conducted by Ruth E. Newell.

The survey area (Figs. 1 & 2) is approximately 17.25 ha and occurs to the immediate west, south and east of the existing quarry. The property is bounded on its west side by the 6014 Road.

Primary habitats present on site include: coniferous (C), mixed (M) and deciduous (D) woodlands with the latter woodland including a narrow gorge and stream. On the west side of the survey area there is an extensive section of exposed, moderately to steeply sloped somewhat open terrain with stunted shrub and tree vegetation (S). This sloped area borders on the 6014 Road on its west side (Fig. 2).

All vascular plants observed during both fall and spring surveys as well as the habitats in which they occur and their provincial general and ACCDC subnational status ranks are provided in TABLE 1. Information on these status ranks including status rank definitions can be found on the Atlantic Canada Conservation Data Centre (ACCDC) websites (http://www.accdc.com/dl_files/Definitions.pdf; http://www.accdc.com/en/general-status.html) and Wild Species 2015, The General Status of Species in Canada website (http://www.registrelep-sararegistry.gc.ca/virtual_sara/files/reports/Wild%20Species%202015.pdf) .

The additional species observed in the second survey (spring) are highlighted in gray in this table.

Figure 1. Satellite image of the present Bay Saint Lawrence Quarry showing the survey area (area outlined in red).

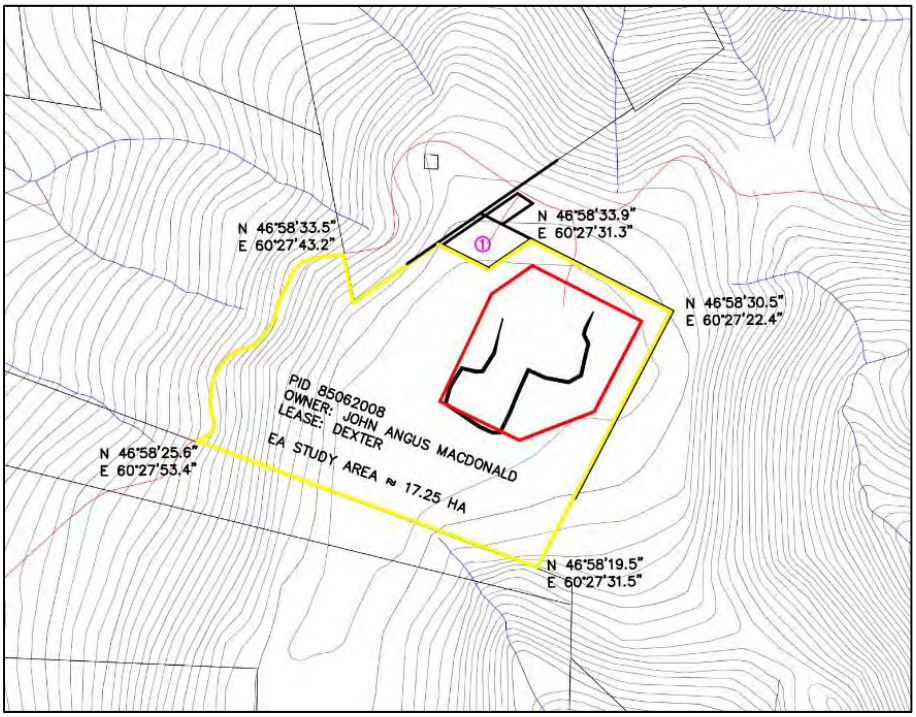


Figure 2. Topographic map of study area (area outlined in yellow). The existing quarry is outlined in red. The west side of the study area is steeply sloped downwards to the access road (6014 Road) (as indicated by the closely spaced contour lines).

Results

Habitat Descriptions

1) Coniferous Forest (C)

There was very limited primarily coniferous woodland within the survey area. Fig. 3 shows a small section of coniferous woodland immediately south of the existing quarry. Balsam Fir (*Abies balsamea*) is the dominant tree in this habitat. At this location, herbaceous vegetation was very sparse while mosses were quite common.

Species of conservation concern:

There were no species of conservation concern observed in this habitat during this survey.

Figure 3. Coniferous woodland immediately south of the existing quarry. Balsam Fir (*Abies balsamea*) is the dominant tree species in this habitat.

2) Mixed Forest (M)

Mixed woodland is the most common forest type present within the survey area (Figs. 4 & 5). Common tree species present included Heart-leaved Birch (*Betula cordifolia*), Red Maple (*Acer rubrum*) and Balsam Fir (*Abies balsamea*). Less common tree species occurring in this habitat included Moose Maple (*Acer pensylvanicum*), Pin Cherry (Prunus pensylvanica) and Mountain Maple (*Acer spicatum*). Shrub species observed included Witherod (*Viburnum nudum* var. *cassinoides*), Northern Mountain-ash (*Sorbus decora*) and Wild Raspberry (*Rubus idaeus* ssp. *strigosus*).

Common herbaceous vascular plant species observed in this habitat included Bracken (*Pteridium aquilinum*), Wood Aster (*Oclemena acuminata*), Large-leaved Goldenrod (*Solidago macrophylla*), Wild Sarsaparilla (*Aralia nudicaulis*), Wild Lily-of-the valley (Maianthemum canadense), New York Fern (*Thelypteris noveboracensis*), Spinulose Woodfern (*Dryopteris carthusiana*) and Bunchberry (*Cornus canadensis*).

Heart-leaved Birch and Balsam Fir become the dominant tree species in mixed woodland on the lower east side of the survey area. Ground cover here is dominated by several fern species including Bracken (*Pteridium aquilinum*) and New York Fern (*Thelypteris noveboracensis*) (Fig. 6). More Birch/fir forest occurs immediately south of the ravine in the lower west corner of the survey area. This area however lacks the dense fern cover present in the birch/fir forest located on the east side of the property.

Mixed forest habitat transforms into more open habitat along its west and south edges with tree species becoming somewhat stunted (Fig. 7). This appears to be a transition zone/area between the mixed forest habitat and the exposed slope habitat. Common species in this area include Pin Cherry (*Prunus pensylvanica*), Balsam Fir (*Abies balsamea*), Northern Mountain-ash (*Sorbus decora*), Mountain Maple (*Acer spicatum*), Heart-leaved Birch (*Betula cordifolia*), Witherod (*Viburnum nudum* var. *cassinoides*), *Corylus cornuta* (Beaked Hazelnut) and Beech Fern (*Phegopteris connectilis*).

Species of conservation concern:

There were no species of conservation concern observed in this habitat during either the spring or the fall surveys.

Figure. 4. Mixed forest in October showing Heart-leaved Birch (*Betula cordifolia*) and Balsam Fir (*Abies balsamea*). Ferns, which are in the process of dying back for the season as indicated by their brown coloration, are common on the forest floor.

Figure 5. Forest floor in mixed woods habitat in late spring, showing abundance of herbaceous species including Clintonia (*Clintonia boreale*), Wild-lily-of-the-valley (*Maianthemum canadense*), Bunchberry (*Cornus canadensis*), and a variety of fern species.

Figure 6. Birch/fir (*Betula cordifolia*/*Abies balsamea*) mixed woodland with Bracken (*Pteridium aquilinum*) and New York Fern (*Thelypteris noveboracensis*) ground cover occurring on the lower east side of the survey area.

Figure 7. Transition zone between mixed forest and open exposed slope habitats. This area of mixed forest is more open and the tree growth is somewhat stunted suggesting that there maybe more exposure to the elements than the woodland situated closer to the quarry.

3) Deciduous Forest (D)

A small area of deciduous woodland occurs in the southwest corner of the survey area. Birches, including Yellow Birch (*Betula alleghaniensis*) and Heart-leaved Birch (*Betula cordifolia*) and maples including Sugar Maple (*Acer saccharum*), Mountain Maple (*A. spicatum*) and Moose Maple (A. *pensylvanicum*), are dominant in this habitat. Herbaceous species present include Drooping Woodland Sedge (*Carex arctata*), Evergreen Wood Fern (*Dryopteris intermedia*), Zigzag Goldenrod (Solidago flexicaulis), Large-leaved Goldenrod (*Solidago macrophylla*) and Braun's Holly Fern (*Polystichum braunii*). Alternate- leaved Dogwood (*Cornus alterniflolia*) is a scattered to common shrub.

Also occurring within this woodland is a narrow, steep-sided gorge through which a small stream flows in a more or less westerly direction (Fig. 8).

Species of conservation concern:

There were no species of conservation concern observed in this habitat during this survey.

Figure 8. Deciduous woodland and narrow gorge (with small stream) located in the southwest corner of the survey area.

4) Exposed Slope (area of scrub vegetation) (S)

Along much of the west side of the survey area there is a steep northwest facing slope which extends downwards to the 6014 Road (Figs. 2, 9, 10 & 11)). Much of the woody vegetation here is moderately to strongly stunted or dead possibly due to wind exposure and/or other environmental factors. This area is more open than the previously described habitats with scattered areas of primarily herbaceous vegetation.

Common woody vegetation here includes Red Elderberry (*Sambucus racemosa* ssp. *pubens*), Bush Honeysuckle (*Diervilla lonicera*), Pin Cherry (*Prunus pensylvanica*), Beaked Hazelnut (*Corylus cornuta*), Balsam Fir (*Abies balsamea*), American Fly Honeysuckle (*Lonicera canadensis*) and Heart-leaved Birch (*Betula cordifolia*). Herbaceous vegetation present includes Bracken (Pteridium aqulinum), Pearly Everlasting (*Anaphalis margaritacea*), Rough Goldenrod (*Solidago rugosa*), Wood Aster (*Oclemena acuminata*) and Evergreen Wood Fern (*Dryopteris intermedia*). Graminoid species present include: Wavy Hair Grass (*Avenella flexuosa*), Weak Bluegrass (*Poa saltuensis*), Colonial Bentgrass (*Agrostis capillaris*), Hairy Woodrush (*Luzula acuminata*), Brownish Sedge (*Carex brunnescens*), Drooping Woodland Sedge (*Carex arctata*) and Fibous-root Sedge (*Carex communis*),

Species of conservation concern:

There were no species of conservation concern observed in this habitat during these surveys.

Figure 9. Exposed northwest facing slope on the west side of the proposed expansion area in the Fall of 2016. Many trees are either stunted or dead in this area. The terrain at this location slopes steeply downwards and abuts onto the Money Point road (Road 6014). Some of the shrubs in this photo are not dead but rather, have dropped their leaves prematurely possibly due to their exposed habitat.

Figure 10. A second fall photo of the steep, exposed, northwest facing slope on the west side of the Money Point quarry property. A number of dead trees can be seen in the photo.

Figure 11. Exposed slope habitat (foreground) in the spring showing an area of primarily herbaceous vegetation.

Discussion

No vascular plant species listed under either federal species-at-risk legislation or provincial species-at-risk- legislation were observed on the quarry property during either the fall or the spring survey. In addition, there were no yellow-listed or orange-listed species observed on site. Yellow and orange species are considered to have a moderate (yellow) to high (orange) risk of extinction but do not have an official listing under either provincial or federal legislation.

All species recorded during this current survey have a Nova Scotia general status rank of either GREEN or EXOTIC (SNA) with GREEN indicating a plant with a secure or apparently secure conservation status within the province, and EXOTIC (SNA) meaning a species that is considered to be non-native to Nova Scotia.

Atlantic Canada Conservation Data Centre subnational status ranks present included S4, S5 and SNA also indicating that there are no species of conservation concern (S4 = apparently secure - uncommon but not rare; some cause for long-term concern due to declines or other factors; S4S5 = apparently secure to secure; S5 = secure - common, widespread, and abundant in the province; SNA = not applicable - a conservation status rank that is not applicable because the species is not a suitable target for conservation activities as for example, a non-native species).

TABLE 1

List of all vascular plants observed on site during both surveys (fall and late spring/early summer), the habitats in which they occur and their status ranks. **Additional species observed during the second survey (spring/early summer) are highlighted in gray.** (Habitats: C = coniferous forest, D = deciduous forest (includes ravine), M = mixed forest, S = exposed slope).

Latin Name	**Common Name**	**Nova Scotia General Status Rank***	**ACCDC Subnational Status Rank****	**Habitat(s)**
Abies balsamea	Balsam Fir	GREEN/S5	S5	C, D, M, S
Acer pensylvanicum	Moose Maple	GREEN/S5	S5	C, D, M, S
Acer rubrum	Red Maple	GREEN/S5	S5	C, M
Acer saccharum	Sugar Maple	LIGHT GREEN/S4S5	S5	D, M
Acer spicatum	Mountain Maple	GREEN/S5	S5	D, M
Agrostis capillaris	Colonial Bentgrass	EXOTIC/SNA	SNA	M, S
Amelanchier sp. (non-flowering)	a shadbush	-	-	M, S
Anaphalis margaritacea	Pearly Everlasting	GREEN/S5	S5	S
Aralia nudicaulis	Wild Sarsparilla	GREEN/S5	S5	C, D, M, S

Latin Name	Common Name	Nova Scotia General Status Rank*	ACCDC Subnational Status Rank**	Habitat(s)
Avenella flexuosa	Wavy Hair Grass	GREEN/S5	S5	S
Betula alleghaniensis	Yellow Birch	GREEN/S5	S5	D, M, S
Betula cordifolia	Heart-leaved Birch	GREEN/S5	S5	C, D, M
Carex arctata	Drooping Woodland Sedge	GREEN/S5	S5	C, D, M, S
Carex brunnescens	Brownish Sedge	GREEN/S5	S5	S
Carex communis	Fibrous-root Sedge	GREEN/S5	S5	S
Carex intumescens	Bladder Sedge	GREEN/S5	S5	M, S
Carex novae-angliae	New England Sedge	GREEN/S5	S5	C, M, S
Circaea alpina	Small Enchanter's Nightshade	GREEN/S5	S5	D
Clintonia boreale	Clintonia	GREEN/S5	S5	C, M,S
Coptis trifolia	Goldthread	GREEN	S5	M
Cornus alternifolia	Alternate-leaved Dogwood	GREEN/S5	S5	D
Cornus canadensis	Bunchberry	GREEN/S5	S5	C, D, M, S
Corylus cornuta	Beaked Hazelnut	GREEN/S5	S5	M, S
Diervilla lonicera	Northern Bush Honeysuckle	GREEN/S5	S5	S
Dryopteris carthusiana	Spinulose Wood Fern	GREEN/S5	S5	C, M
Dryopteris intermedia	Evergreen Wood Fern	GREEN/S5	S5	D, S
Fragaria virginiana	Wild Strawberry	GREEN/S5	S5	S
Hieracium xfloribundum	Smoothish Hawkweed	SNA	SNA	S
Huperzia lucidula	Shining Clubmoss	GREEN/S5	S5	M
Ilex mucronata	Mountain Holly	GREEN/S5	S5	M
Linnaea borealis	Twinflower	GREEN/S5	S5	C, M
Lonicera canadensis	Canada Fly Honeysuckle	GREEN/S5	S5	M, S
Luzula acuminata	Hairy Woodrush	GREEN/S5	S5	S
Luzula multiflora	Common Woodrush	GREEN/S5	S5	S
Lycopodium annotinum	Bristly Clubmoss	GREEN/S5	S5	M

Latin Name	Common Name	Nova Scotia General Status Rank*	ACCDC Subnational Status Rank**	Habitat(s)
Lysimachia borealis	Starflower	GREEN/S5	S5	C, M
Maianthemum canadense	Wild-Lily-of-the-Valley	GREEN/S5	S5	C, D, M
Maianthemum racemosum	Large False Solomon's Seal	LIGHT GREEN/S4S5	S4S5	S
Mitchella repens	Partridgeberry	GREEN/S5	S5	M
Monotropa uniflora	Indian Pipe	GREEN/S5	S5	S
Oclemena acuminata	Wood Aster	GREEN/S5	S5	C, D, M, S
Osmunda claytoniana	Interrupted Fern	GREEN/S5	S5	M
Osmundastrum cinnamomeum	Cinnamon Fern	GREEN/S5	S5	M
Oxalis montana	Wood Sorrel	GREEN/S5	S5	C, M
Phegopteris connectilis	Northern Beech Fern	GREEN/	S5	D, M, S
Poa nemoralis	Wood Bluegrass	SNA (Exotic)	SNA	S
Poa saltuensis	Weak Bluegrass	GREEN/S5	S5	D, M, S
Polystichum braunii	Braun's Holly Fern	LIGHT GREEN/S4	S4	D
Prunus pensylvanica	Pin Cherry	GREEN/S5	S5	D, M, S
Prunus virginiana	Chokecherry	GREEN/S5	S5	M, S
Pteridium aquilinum	Bracken	GREEN/S5	S5	C, M, S
Ranunculus repens	Creeping Buttercup	SNA (Exotic)	SNA	S
Ribes glandulosum	Skunk Currant	GREEN/S5	S5	M
Ribes hirtellum	Swamp Gooseberry	GREEN/S5	S5	S
Rubus idaeus ssp. *strigosus*	Wild Raspberry	GREEN/S5	S5	C, M, S
Rumex acetosella	Sheep Sorrel	SNA (Exotic)	SNA	S
Sambucus racemosa ssp. *pubens*	Red Elderberry	GREEN/S5	S5	D, M, S
Solidago canadensis	Canada Goldenrod	LIGHT GREEN/S4S5	S5	S
Solidago flexicaulis	ZIgzag Goldenrod	GREEN/S5	S5	D

Latin Name	Common Name	Nova Scotia General Status Rank*	ACCDC Subnational Status Rank**	Habitat(s)
Solidago macrophylla	Large-leaved Goldenrod	LIGHT GREEN/S4	S4	C, D, M
Solidago rugosa	Rough Goldenrod	GREEN/S5	S5	M, S
Sorbus decora	Northern Mountain-ash	LIGHT GREEN/S4	S5	C, D, M, S
Thelypteris noveboracensis	New York Fern	GREEN/S5	S5	C, M
Vaccinium angustifolium	Lowbush Blueberry	GREEN/S5	S5	M
Veronica officinalis	Common Speedwell	SNA (Exotic)	SNA	D, S
Viburnum nudum var. *cassinoides*	Witherod	GREEN/S5	S5	C, M
Viola selkirkii?	Selkirk's Violet	LIGHT GREEN/S4	S4	S

*The Nova Scotia general status ranks used in this report are based on the ranks used in the 2015 Wild Species of Canada Report (available at http://www.wildspecies.ca/reports) ; **GREEN/S5 = secure** (at very low or no risk of extirpation in the jurisdiction due to a very extensive range, abundant populations or occurrences, with little to no concern from declines or threats**; LIGHT GREEN/S4 = apparently secure** (at a fairly low risk of extirpation in the jurisdiction due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors**; S4S5 =** apparently secure to secure; **SNA = non-native** (exotic).

ACCDC: Atlantic Canada Conservation Data Centre (http://www.accdc.com/en/ranks.html; explanation of status ranks: **S5 = Secure (common, widespread, and abundant in the province); **S4 = Apparently Secure** (uncommon but not rare; some cause for long-term concern due to declines or other factors); S4S5 = Apparently secure to secure; **SNA** = **Not Applicable** - A conservation status rank is not applicable because the species is not a suitable target for conservation activities, e.g. a non-native species.

APPENDIX C

ATLANTIC CANADA CONSERVATION DATA CENTRE REPORT

Atlantic Canada Conservation Data Centre
Centre de données sur la conservation du Canada atlantique

DATA REPORT 5708: Money Point, NS

Prepared 16 November 2016
by J. Churchill, Data Manager

CONTENTS OF REPORT

Map 1. A 100 km buffer around the study area

1.0 PREFACE

The Atlantic Canada Conservation Data Centre (ACCDC) is part of a network of NatureServe data centres and heritage programs serving 50 states in the U.S.A, 10 provinces and 1 territory in Canada, plus several Central and South American countries. The NatureServe network is more than 30 years old and shares a common conservation data methodology. The ACCDC was founded in 1997, and maintains data for the jurisdictions of New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador. Although a non-governmental agency, the ACCDC is supported by 6 federal agencies and 4 provincial governments, as well as through outside grants and data processing fees. URL: www.ACCDC.com.

Upon request and for a fee, the ACCDC queries its database and produces customized reports of the rare and endangered flora and fauna known to occur in or near a specified study area. As a supplement to that data, the ACCDC includes locations of managed areas with some level of protection, and known sites of ecological interest or sensitivity.

1.1 DATA LIST

Included datasets:

Filename	Contents
MoneyPtNS_5708ob.xls	All Rare and legally protected *Flora and Fauna* within 5 km of your study area
MoneyPtNS_5708ob100km.xls	A list of Rare and legally protected *Flora and Fauna* within 100 km of your study area
MoneyPtNS_5708ma.xls	All *Managed Areas* in your study area
MoneyPtNS_5708sa.xls	All *Significant Natural Areas* in your study area

1.2 RESTRICTIONS

The ACCDC makes a strong effort to verify the accuracy of all the data that it manages, but it shall not be held responsible for any inaccuracies in data that it provides. By accepting ACCDC data, recipients assent to the following limits of use:

a) Data is restricted to use by trained personnel who are sensitive to landowner interests and to potential threats to rare and/or endangered flora and fauna posed by the information provided.
b) Data is restricted to use by the specified Data User; any third party requiring data must make its own data request.
c) The ACCDC requires Data Users to cease using and delete data 12 months after receipt, and to make a new request for updated data if necessary at that time.
d) ACCDC data responses are restricted to the data in our Data System at the time of the data request.
e) Each record has an estimate of locational uncertainty, which must be referenced in order to understand the record's relevance to a particular location. Please see attached Data Dictionary for details.
f) ACCDC data responses are not to be construed as exhaustive inventories of taxa in an area.
g) The absence of a taxon cannot be inferred by its absence in an ACCDC data response.

1.3 ADDITIONAL INFORMATION

The attached file DataDictionary 2.1.pdf provides metadata for the data provided.

Please direct any additional questions about ACCDC data to the following individuals:

Plants, Lichens, Ranking Methods, All other Inquiries
Sean Blaney, Senior Scientist, Executive Director
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Billing
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Questions on the biology of Federal Species at Risk can be directed to ACCDC: (506) 364-2658, with questions on Species at Risk regulations to: Samara Eaton, Canadian Wildlife Service (NB and PE): (506) 364-5060 or Julie McKnight, Canadian Wildlife Service (NS): (902) 426-4196.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in New Brunswick, please contact Stewart Lusk, Natural Resources: (506) 453-7110.

For provincial information about rare taxa and protected areas, or information about game animals, deer yards, old growth forests, archeological sites, fish habitat etc., in Nova Scotia, please contact Sherman Boates, NSDNR: (902) 679-6146. To determine if location-sensitive species (section 4.3) occur near your study site please contact a NSDNR Regional Biologist:

Western: Duncan Bayne
(902) 648-3536
Duncan.Bayne@novascotia.ca

Western: Donald Sam
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For provincial information about rare taxa and protected areas, or information about game animals, fish habitat etc., in Prince Edward Island, please contact Garry Gregory, PEI Dept. of Communities, Land and Environment: (902) 569-7595.

2.0 RARE AND ENDANGERED SPECIES

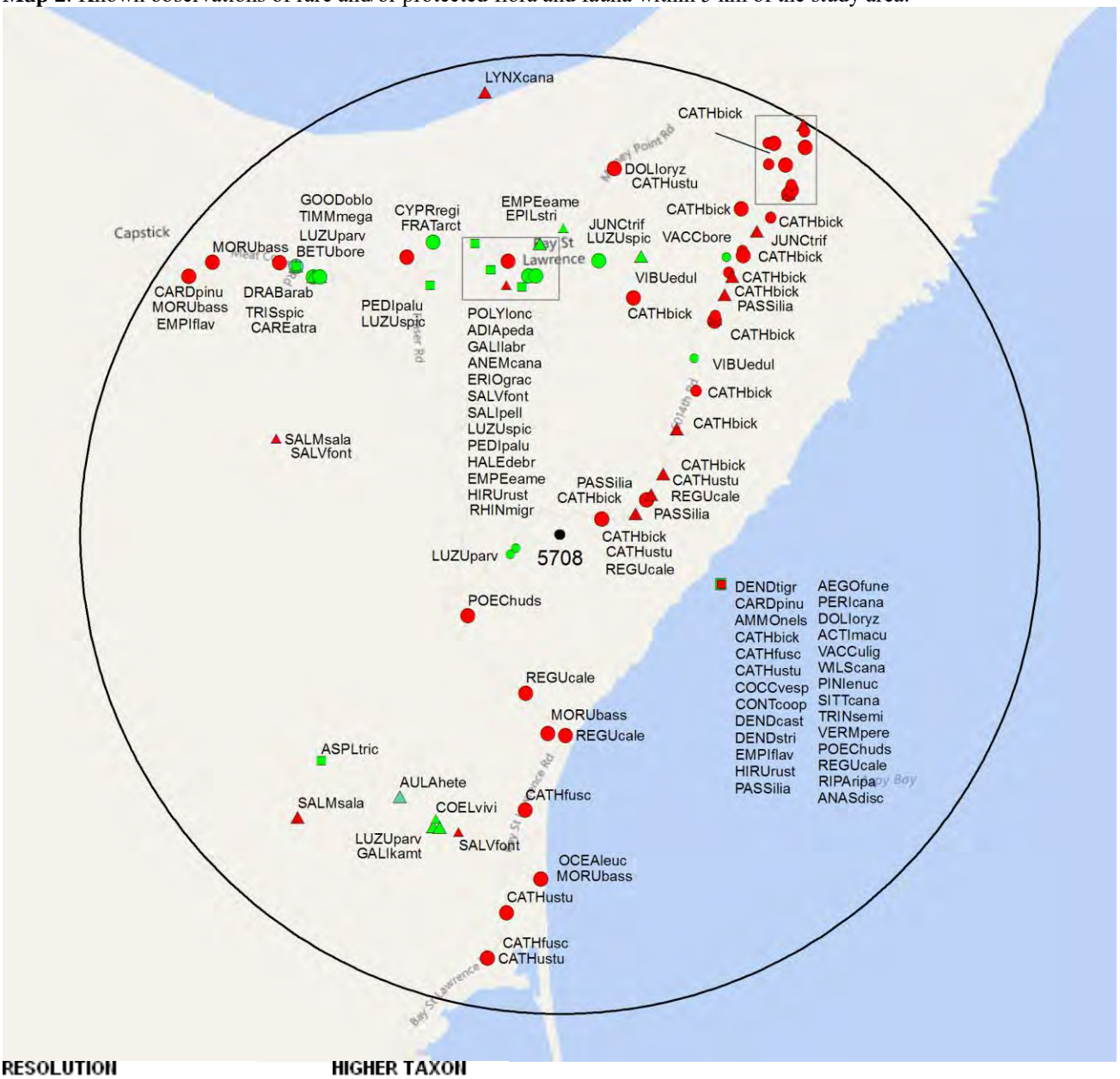
2.1 FLORA

A 5 km buffer around the study area contains 44 records of 26 vascular, 2 records of 2 nonvascular flora (Map 2 and attached: *ob.xls).

2.2 FAUNA

A 5 km buffer around the study area contains 201 records of 32 vertebrate, no records of invertebrate fauna (Map 2 and attached data files - see 1.1 Data List). Please see section 4.3 to determine if 'location-sensitive' species occur near your study site.

Map 2: Known observations of rare and/or protected flora and fauna within 5 km of the study area.



RESOLUTION

- 4.7 within 50s of kilometers
- 4.0 within 10s of kilometers
- 3.7 within 5s of kilometers
- 3.0 within kilometers
- 2.7 within 500s of meters
- 2.0 within 100s of meters
- 1.7 within 10s of meters

HIGHER TAXON

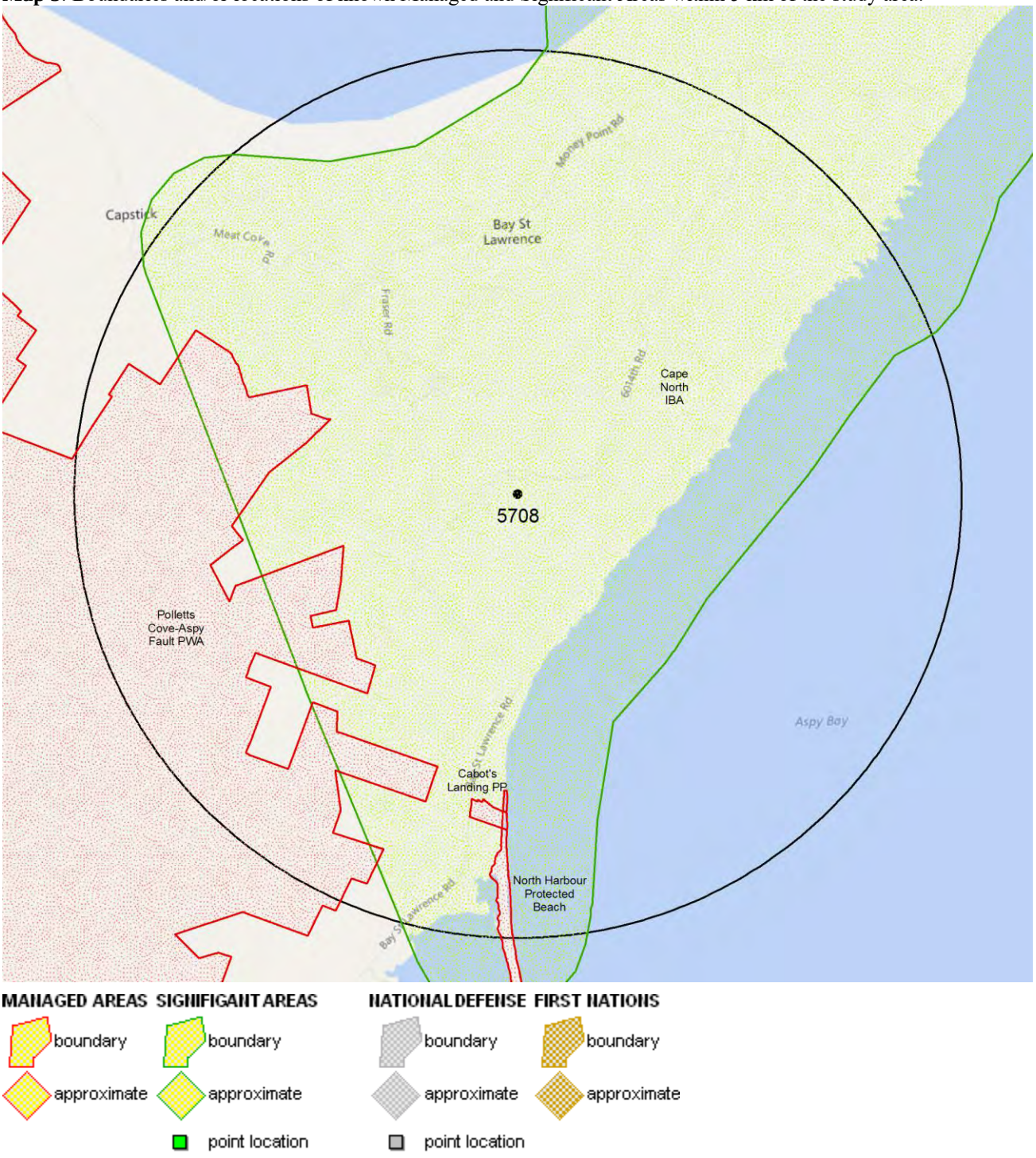
- vertebrate fauna
- invertebrate fauna
- vascular flora
- nonvascular flora

3.0 SPECIAL AREAS

3.1 MANAGED AREAS
The GIS scan identified 3 managed areas in the vicinity of the study area (Map 3 and attached file: *ma*.xls)

3.2 SIGNIFICANT AREAS
The GIS scan identified 1o biologically significant site in the vicinity of the study area (Map 3 and attached file: *sa*.xls)

Map 3: Boundaries and/or locations of known Managed and Significant Areas within 5 km of the study area.



4.0 RARE SPECIES LISTS

Rare and/or endangered taxa (excluding "location-sensitive" species, section 4.3) within the 5 km-buffered area listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (± the precision, in km, of the record). [P] = vascular plant, [N] = nonvascular plant, [A] = vertebrate animal, [I] = invertebrate animal, [C] = community. Note: records are from attached files *ob.xls/*ob.shp only.

4.1 FLORA

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
N	*Aulacomnium heterostichum*	One-sided Groove Moss				S1S2	3 Sensitive	1	3.2 ± 1.0
N	*Timmia megapolitana*	Metropolitan Timmia Moss				S1S2	3 Sensitive	1	3.9 ± 0.0
P	*Pedicularis palustris*	Marsh Lousewort				S1	2 May Be At Risk	5	2.7 ± 0.0
P	*Rhinanthus minor ssp. groenlandicus*	Little Yellow Rattle				S1	2 May Be At Risk	1	3.2 ± 1.0
P	*Luzula spicata*	Spiked Woodrush				S1	2 May Be At Risk	4	2.6 ± 5.0
P	*Adiantum pedatum*	Northern Maidenhair Fern				S1	2 May Be At Risk	1	2.9 ± 5.0
P	*Halenia deflexa ssp. brentoniana*	Spurred Gentian				S1?	5 Undetermined	1	2.7 ± 0.0
P	*Betula borealis*	Northern Birch				S2	3 Sensitive	1	3.9 ± 1.0
P	*Draba arabisans*	Rock Whitlow-Grass				S2	3 Sensitive	1	3.7 ± 0.0
P	*Anemone canadensis*	Canada Anemone				S2	2 May Be At Risk	2	2.7 ± 0.0
P	*Galium labradoricum*	Labrador Bedstraw				S2	3 Sensitive	1	2.9 ± 5.0
P	*Carex atratiformis*	Scabrous Black Sedge				S2	3 Sensitive	1	3.7 ± 1.0
P	*Cypripedium reginae*	Showy Lady's-Slipper				S2	2 May Be At Risk	1	3.3 ± 0.0
P	*Polystichum lonchitis*	Northern Holly Fern				S2	3 Sensitive	1	2.9 ± 5.0
P	*Salix pellita*	Satiny Willow				S2S3	3 Sensitive	1	2.6 ± 1.0
P	*Eriophorum gracile*	Slender Cottongrass				S2S3	3 Sensitive	1	2.9 ± 5.0
P	*Juncus trifidus*	Highland Rush				S2S3	3 Sensitive	4	2.9 ± 2.0
P	*Coeloglossum viride var. virescens*	Long-bracted Frog Orchid				S2S3	2 May Be At Risk	1	3.3 ± 1.0
P	*Viburnum edule*	Squashberry				S3	3 Sensitive	2	2.3 ± 0.0
P	*Empetrum eamesii*	Pink Crowberry				S3	3 Sensitive	2	2.7 ± 0.0
P	*Vaccinium boreale*	Northern Blueberry				S3	3 Sensitive	1	3.4 ± 0.0
P	*Vaccinium uliginosum*	Alpine Bilberry				S3	3 Sensitive	1	1.8 ± 7.0
P	*Epilobium strictum*	Downy Willowherb				S3	3 Sensitive	1	3.2 ± 0.0
P	*Galium kamtschaticum*	Northern Wild Licorice				S3	4 Secure	1	3.2 ± 0.0
P	*Goodyera oblongifolia*	Menzies' Rattlesnake-plantain				S3	3 Sensitive	3	3.7 ± 1.0
P	*Asplenium trichomanes*	Maidenhair Spleenwort				S3	4 Secure	1	3.4 ± 1.0
P	*Luzula parviflora*	Small-flowered Woodrush				S3S4	4 Secure	4	0.5 ± 0.0
P	*Trisetum spicatum*	Narrow False Oats				S3S4	4 Secure	1	3.9 ± 5.0

4.2 FAUNA

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	*Catharus bicknelli*	Bicknell's Thrush	Threatened	Special Concern	Endangered	S1S2B	1 At Risk	49	0.8 ± 1.0
A	*Riparia riparia*	Bank Swallow	Threatened			S2S3B	2 May Be At Risk	5	1.8 ± 7.0
A	*Hirundo rustica*	Barn Swallow	Threatened		Endangered	S3B	1 At Risk	4	1.8 ± 7.0
A	*Contopus cooperi*	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B	1 At Risk	1	1.8 ± 7.0
A	*Wilsonia canadensis*	Canada Warbler	Threatened	Threatened	Endangered	S3S4B	1 At Risk	1	1.8 ± 7.0
A	*Dolichonyx oryzivorus*	Bobolink	Threatened		Vulnerable	S3S4B	3 Sensitive	4	1.8 ± 7.0
A	*Lynx canadensis*	Canadian Lynx	Not At Risk		Endangered	S1	1 At Risk	2	4.7 ± 1.0
A	*Aegolius funereus*	Boreal Owl	Not At Risk			S2?B	5 Undetermined	3	1.8 ± 7.0
A	*Ammodramus nelsoni*	Nelson's Sparrow	Not At Risk			S3S4B	4 Secure	1	1.8 ± 7.0
A	*Salmo salar*	Atlantic Salmon				S1	2 May Be At Risk	2	3.1 ± 0.0
A	*Dendroica tigrina*	Cape May Warbler				S2B	3 Sensitive	1	1.8 ± 7.0
A	*Carduelis pinus*	Pine Siskin				S2S3	3 Sensitive	7	1.8 ± 7.0
A	*Tringa semipalmata*	Willet				S2S3B	2 May Be At Risk	1	1.8 ± 7.0

	Scientific *Name*	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)
A	*Pinicola enucleator*	Pine Grosbeak				S2S3B,S5N	2 May Be At Risk	3	1.8 ± 7.0
A	*Perisoreus canadensis*	Gray Jay				S3	3 Sensitive	3	1.8 ± 7.0
A	*Poecile hudsonica*	Boreal Chickadee				S3	3 Sensitive	9	1.3 ± 0.0
A	*Sitta canadensis*	Red-breasted Nuthatch				S3	4 Secure	5	1.8 ± 7.0
A	*Salvelinus fontinalis*	Brook Trout				S3	3 Sensitive	3	2.7 ± 0.0
A	*Oceanodroma leucorhoa*	Leach's Storm-Petrel				S3B,S5M	4 Secure	1	3.6 ± 0.0
A	*Fratercula arctica*	Atlantic Puffin				S3B,S5N	3 Sensitive	1	3.3 ± 0.0
A	*Anas discors*	Blue-winged Teal				S3S4B	2 May Be At Risk	1	1.8 ± 7.0
A	*Actitis macularius*	Spotted Sandpiper				S3S4B	3 Sensitive	3	1.8 ± 7.0
A	*Empidonax flaviventris*	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	5	1.8 ± 7.0
A	*Regulus calendula*	Ruby-crowned Kinglet				S3S4B	3 Sensitive	14	0.5 ± 0.0
A	*Catharus fuscescens*	Veery				S3S4B	4 Secure	5	1.8 ± 7.0
A	*Catharus ustulatus*	Swainson's Thrush				S3S4B	4 Secure	23	0.5 ± 0.0
A	*Vermivora peregrina*	Tennessee Warbler				S3S4B	3 Sensitive	5	1.8 ± 7.0
A	*Dendroica castanea*	Bay-breasted Warbler				S3S4B	3 Sensitive	6	1.8 ± 7.0
A	*Dendroica striata*	Blackpoll Warbler				S3S4B	3 Sensitive	9	1.8 ± 7.0
A	*Passerella iliaca*	Fox Sparrow				S3S4B	4 Secure	15	0.5 ± 0.0
A	*Coccothraustes vespertinus*	Evening Grosbeak				S3S4B,S3N	4 Secure	1	1.8 ± 7.0
A	*Morus bassanus*	Northern Gannet				SHB,S5M	4 Secure	8	2.1 ± 0.0

4.3 LOCATION SENSITIVE SPECIES

The Department of Natural Resources in each Maritimes province considers a number of species “location sensitive”. Concern about exploitation of location-sensitive species precludes inclusion of precise coordinates in this report. Those intersecting a 5 km buffer of your study area are indicated below with “YES”.

Nova Scotia

Scientific *Name*	Common Name	SARA	Prov Legal Prot	Known within 5 km of Study Site?
Fraxinus nigra	Black Ash		Threatened	No
Emydoidea blandingii	*Blanding's Turtle - Nova Scotia pop.*	Endangered	Vulnerable	No
Glyptemys insculpta	Wood Turtle	Threatened	Threatened	No
Falco peregrinus pop. 1	Peregrine Falcon - anatum/tundrius pop.	Special Concern	Vulnerable	No
Bat Hibernaculum		[Endangered][1]	[Endangered][1]	No

1 *Myotis lucifugus* (Little Brown Myotis), *Myotis septentrionalis* (Long-eared Myotis), and *Perimyotis subflavus* (Tri-colored Bat or Eastern Pipistrelle) are all Endangered under the Federal Species at Risk Act and the NS Endangered Species Act.

4.4 SOURCE BIBLIOGRAPHY

The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

# recs	CITATION
143	Lepage, D. 2014. Maritime Breeding Bird Atlas Database. Bird Studies Canada, Sackville NB, 407,838 recs.
27	Erskine, A.J. 1992. Maritime Breeding Bird Atlas Database. NS Museum & Nimbus Publ., Halifax, 82,125 recs.
21	Newell, R.E. 2000. E.C. Smith Herbarium Database. Acadia University, Wolfville NS, 7139 recs.
13	Benjamin, L.K. (compiler). 2012. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 4965 recs.
10	Busby, D.G. 1999. 1997-1999 Bicknell's Thrush data, unpublished files. Canadian Wildlife Service, Sackville, 17 recs.
9	Newell, R.E. 2005. E.C. Smith Digital Herbarium. E.C. Smith Herbarium, Irving Biodiversity Collection, Acadia University, Web site: http://luxor.acadiau.ca/library/Herbarium/project/. 582 recs.
8	Pronych, G. & Wilson, A. 1993. Atlas of Rare Vascular Plants in Nova Scotia. Nova Scotia Museum, Halifax NS, I:1-168, II:169-331. 1446 recs.
7	Benjamin, L.K. (compiler). 2007. Significant Habitat & Species Database. Nova Scotia Dept Natural Resources, 8439 recs.
3	Basquill, S.P.; Quigley, E. 2011. Rare plant observations from Cape North. Nova Scotia Department of Natural Resources, Pers. comm. , 4 recs.
3	Staff, DNR 2007. Restricted & Limited Use Land Database (RLUL).

2 Blaney, C.S.; Mazerolle, D.M. 2008. Fieldwork 2008. Atlantic Canada Conservation Data Centre. Sackville NB, 13343 recs.
1 Belland, R.J. Maritimes moss records from various herbarium databases. 2014.
1 Bird Studies Canada & Nature Canada. 2004-10. Important Bird Areas of Canada Database. Bird Studies Canada, Port Rowan ON, 62 objects.
1 Downes, C. 1998-2000. Breeding Bird Survey Data. Canadian Wildlife Service, Ottawa, 111 recs.
1 Parker, G.R., Maxwell, J.W., Morton, L.D. & Smith,G.E.J. 1983. The ecology of Lynx , Lynx canadensis, on Cape Breton Island. Canadian Journal of Zoology, 61:770-786. 51 recs.
1 Sollows, M.C,. 2008. NBM Science Collections databases: mammals. New Brunswick Museum, Saint John NB, download Jan. 2008, 4983 recs.

5.0 RARE SPECIES WITHIN 100 KM

A 100 km buffer around the study area contains 6566 records of 113 vertebrate and 204 records of 31 invertebrate fauna; 3247 records of 238 vascular, 217 records of 84 nonvascular flora (attached: *ob100km.xls).

Taxa within 100 km of the study site that are rare and/or endangered in the province in which the study site occurs. All ranks correspond to the province in which the study site falls, even for out-of-province records. Taxa are listed in order of concern, beginning with legally listed taxa, with the number of observations per taxon and the distance in kilometers from study area centroid to the closest observation (± the precision, in km, of the record).

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	*Myotis lucifugus*	Little Brown Myotis	Endangered	Endangered	Endangered	S1	1 At Risk	27	10.6 ± 0.0	NS
A	*Charadrius melodus melodus*	Piping Plover melodus ssp	Endangered	Endangered	Endangered	S1B	1 At Risk	142	5.4 ± 0.0	NS
A	*Calidris canutus rufa*	Red Knot rufa ssp	Endangered		Endangered	S2M	1 At Risk	26	87.2 ± 0.0	NS
A	*Rangifer tarandus pop. 2*	Woodland Caribou (Atlantic-Gasp├⌐sie pop.)	Endangered	Endangered	Extirpated	SX	0.1 Extirpated	1	36.1 ± 0.0	NS
A	*Catharus bicknelli*	Bicknell's Thrush	Threatened	Special Concern	Endangered	S1S2B	1 At Risk	224	0.8 ± 1.0	NS
A	*Glyptemys insculpta*	Wood Turtle	Threatened	Threatened	Threatened	S2	3 Sensitive	18	9.3 ± 0.0	NS
A	*Anguilla rostrata*	American Eel	Threatened			S2	4 Secure	1	89.3 ± 0.0	NS
A	*Chaetura pelagica*	Chimney Swift	Threatened	Threatened	Endangered	S2B,S1M	1 At Risk	20	10.7 ± 7.0	NS
A	*Chordeiles minor*	Common Nighthawk	Threatened	Threatened	Threatened	S2S3B	1 At Risk	10	20.7 ± 0.0	NS
A	*Riparia riparia*	Bank Swallow	Threatened			S2S3B	2 May Be At Risk	108	1.8 ± 7.0	NS
A	*Hirundo rustica*	Barn Swallow	Threatened		Endangered	S3B	1 At Risk	95	1.8 ± 7.0	NS
A	*Contopus cooperi*	Olive-sided Flycatcher	Threatened	Threatened	Threatened	S3B	1 At Risk	121	1.8 ± 7.0	NS
A	*Wilsonia canadensis*	Canada Warbler	Threatened	Threatened	Endangered	S3S4B	1 At Risk	30	1.8 ± 7.0	NS
A	*Dolichonyx oryzivorus*	Bobolink	Threatened		Vulnerable	S3S4B	3 Sensitive	47	1.8 ± 7.0	NS
A	*Bucephala islandica (Eastern pop.)*	Barrow's Goldeneye - Eastern pop.	Special Concern	Special Concern		S1N	1 At Risk	1	82.6 ± 16.0	NS
A	*Asio flammeus*	Short-eared Owl	Special Concern	Special Concern		S1S2B	2 May Be At Risk	3	71.0 ± 7.0	NS
A	*Euphagus carolinus*	Rusty Blackbird	Special Concern	Special Concern	Endangered	S2B	2 May Be At Risk	55	13.4 ± 7.0	NS
A	*Histrionicus histrionicus pop. 1*	Harlequin Duck - Eastern pop.	Special Concern	Special Concern	Endangered	S2N	1 At Risk	2	69.5 ± 0.0	NS
A	*Contopus virens*	Eastern Wood-Pewee	Special Concern		Vulnerable	S3S4B	3 Sensitive	33	10.7 ± 7.0	NS
A	*Tryngites subruficollis*	Buff-breasted Sandpiper	Special Concern			SNA	8 Accidental	14	87.2 ± 0.0	NS
A	*Lynx canadensis*	Canadian Lynx	Not At Risk		Endangered	S1	1 At Risk	178	4.7 ± 1.0	NS
A	*Sorex dispar*	Long-tailed Shrew	Not At Risk	Special Concern		S2	3 Sensitive	18	15.5 ± 0.0	NS
A	*Aegolius funereus*	Boreal Owl	Not At Risk			S2?B	5 Undetermined	11	1.8 ± 7.0	NS
A	*Globicephala melas*	Long-finned Pilot Whale	Not At Risk			S2S3		6	57.1 ± 1.0	NS
A	*Hemidactylium scutatum*	Four-toed Salamander	Not At Risk			S3	4 Secure	6	91.5 ± 0.0	NS
A	*Sterna hirundo*	Common Tern	Not At Risk			S3B	3 Sensitive	114	7.3 ± 0.0	NS
A	*Sialia sialis*	Eastern Bluebird	Not At Risk			S3B	3 Sensitive	2	27.5 ± 7.0	NS
A	*Buteo lagopus*	Rough-legged Hawk	Not At Risk			S3N	4 Secure	1	20.7 ± 0.0	NS
A	*Accipiter gentilis*	Northern Goshawk	Not At Risk			S3S4	4 Secure	27	10.7 ± 7.0	NS
A	*Circus cyaneus*	Northern Harrier	Not At Risk			S3S4B	4 Secure	50	10.7 ± 7.0	NS
A	*Ammodramus nelsoni*	Nelson's Sparrow	Not At Risk			S3S4B	4 Secure	14	1.8 ± 7.0	NS
A	*Morone saxatilis*	Striped Bass	E,E,SC			S2S3	2 May Be At Risk	3	6.5 ± 0.0	NS
A	*Martes americana*	American Marten			Endangered	S1	1 At Risk	31	15.9 ± 0.0	NS
A	*Salmo salar*	Atlantic Salmon				S1	2 May Be At Risk	44	3.1 ± 0.0	NS
A	*Picoides dorsalis*	American Three-toed Woodpecker				S1?	5 Undetermined	3	13.4 ± 7.0	NS
A	*Uria aalge*	Common Murre				S1?B,S5N	4 Secure	3	66.1 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	*Anas acuta*	Northern Pintail				S1B	2 May Be At Risk	1	91.4 ± 15.0	NS
A	*Mimus polyglottos*	Northern Mockingbird				S1B	4 Secure	1	93.1 ± 7.0	NS
A	*Vireo gilvus*	Warbling Vireo				S1B	5 Undetermined	4	10.7 ± 7.0	NS
A	*Calidris minutilla*	Least Sandpiper				S1B,S3M	4 Secure	87	29.9 ± 0.0	NS
A	*Charadrius semipalmatus*	Semipalmated Plover				S1B,S3S4M	4 Secure	123	8.4 ± 0.0	NS
A	*Pluvialis dominica*	American Golden-Plover				S1S2M	3 Sensitive	45	87.2 ± 0.0	NS
A	*Limosa haemastica*	Hudsonian Godwit				S1S2M	3 Sensitive	12	87.2 ± 0.0	NS
A	*Microtus chrotorrhinus*	Rock Vole				S2	4 Secure	16	30.2 ± 0.0	NS
A	*Vireo philadelphicus*	Philadelphia Vireo				S2?B	5 Undetermined	11	8.2 ± 0.0	NS
A	*Anas clypeata*	Northern Shoveler				S2B	2 May Be At Risk	1	82.5 ± 0.0	NS
A	*Anas strepera*	Gadwall				S2B	2 May Be At Risk	1	82.2 ± 0.0	NS
A	*Empidonax traillii*	Willow Flycatcher				S2B	3 Sensitive	1	61.2 ± 0.0	NS
A	*Dendroica tigrina*	Cape May Warbler				S2B	3 Sensitive	26	1.8 ± 7.0	NS
A	*Pooecetes gramineus*	Vesper Sparrow				S2B	2 May Be At Risk	12	8.3 ± 7.0	NS
A	*Molothrus ater*	Brown-headed Cowbird				S2B	4 Secure	7	10.7 ± 7.0	NS
A	*Alca torda*	Razorbill				S2B,S4N	3 Sensitive	43	61.2 ± 0.0	NS
A	*Bucephala clangula*	Common Goldeneye				S2B,S5N	4 Secure	29	13.4 ± 7.0	NS
A	*Phalacrocorax carbo*	Great Cormorant				S2S3	3 Sensitive	132	7.7 ± 0.0	NS
A	*Asio otus*	Long-eared Owl				S2S3	2 May Be At Risk	4	27.5 ± 7.0	NS
A	*Carduelis pinus*	Pine Siskin				S2S3	3 Sensitive	118	1.8 ± 7.0	NS
A	*Rallus limicola*	Virginia Rail				S2S3B	5 Undetermined	1	85.5 ± 7.0	NS
A	*Tringa semipalmata*	Willet				S2S3B	2 May Be At Risk	104	1.8 ± 7.0	NS
A	*Petrochelidon pyrrhonota*	Cliff Swallow				S2S3B	2 May Be At Risk	21	12.7 ± 0.0	NS
A	*Pheucticus ludovicianus*	Rose-breasted Grosbeak				S2S3B	3 Sensitive	27	13.4 ± 7.0	NS
A	*Pinicola enucleator*	Pine Grosbeak				S2S3B,S5N	2 May Be At Risk	99	1.8 ± 7.0	NS
A	*Numenius phaeopus hudsonicus*	Hudsonian Whimbrel				S2S3M	3 Sensitive	39	87.2 ± 0.0	NS
A	*Calidris melanotos*	Pectoral Sandpiper				S2S3M	4 Secure	33	87.2 ± 0.0	NS
A	*Phalaropus fulicarius*	Red Phalarope				S2S3M	3 Sensitive	1	87.2 ± 0.0	NS
A	*Perisoreus canadensis*	Gray Jay				S3	3 Sensitive	97	1.8 ± 7.0	NS
A	*Poecile hudsonica*	Boreal Chickadee				S3	3 Sensitive	250	1.3 ± 0.0	NS
A	*Sitta canadensis*	Red-breasted Nuthatch				S3	4 Secure	152	1.8 ± 7.0	NS
A	*Alosa pseudoharengus*	Alewife				S3	3 Sensitive	22	6.5 ± 0.0	NS
A	*Salvelinus fontinalis*	Brook Trout				S3	3 Sensitive	39	2.7 ± 0.0	NS
A	*Synaptomys cooperi*	Southern Bog Lemming				S3	4 Secure	6	33.5 ± 0.0	NS
A	*Pekania pennanti*	Fisher				S3	3 Sensitive	1	87.1 ± 0.0	NS
A	*Calidris maritima*	Purple Sandpiper				S3?N	3 Sensitive	8	29.9 ± 0.0	NS
A	*Falco sparverius*	American Kestrel				S3B	4 Secure	61	13.4 ± 7.0	NS
A	*Charadrius vociferus*	Killdeer				S3B	3 Sensitive	69	10.7 ± 7.0	NS
A	*Gallinago delicata*	Wilson's Snipe				S3B	3 Sensitive	119	10.7 ± 7.0	NS
A	*Sterna paradisaea*	Arctic Tern				S3B	2 May Be At Risk	34	5.4 ± 0.0	NS
A	*Coccyzus erythropthalmus*	Black-billed Cuckoo				S3B	2 May Be At Risk	3	50.6 ± 7.0	NS
A	*Tyrannus tyrannus*	Eastern Kingbird				S3B	3 Sensitive	18	10.7 ± 7.0	NS
A	*Dumetella carolinensis*	Gray Catbird				S3B	2 May Be At Risk	30	10.7 ± 7.0	NS
A	*Wilsonia pusilla*	Wilson's Warbler				S3B	3 Sensitive	40	8.3 ± 7.0	NS
A	*Tringa melanoleuca*	Greater Yellowlegs				S3B,S3S4M	3 Sensitive	249	8.4 ± 0.0	NS
A	*Oceanodroma leucorhoa*	Leach's Storm-Petrel				S3B,S5M	4 Secure	11	3.6 ± 0.0	NS
A	*Rissa tridactyla*	Black-legged Kittiwake				S3B,S5N	3 Sensitive	37	12.7 ± 0.0	NS
A	*Fratercula arctica*	Atlantic Puffin				S3B,S5N	3 Sensitive	35	3.3 ± 0.0	NS
A	*Pluvialis squatarola*	Black-bellied Plover				S3M	4 Secure	149	8.4 ± 0.0	NS
A	*Tringa flavipes*	Lesser Yellowlegs				S3M	4 Secure	71	8.4 ± 0.0	NS
A	*Arenaria interpres*	Ruddy Turnstone				S3M	4 Secure	62	29.9 ± 0.0	NS
A	*Calidris pusilla*	Semipalmated Sandpiper				S3M	3 Sensitive	108	8.4 ± 0.0	NS
A	*Calidris fuscicollis*	White-rumped Sandpiper				S3M	4 Secure	49	77.7 ± 0.0	NS
A	*Limnodromus griseus*	Short-billed Dowitcher				S3M	4 Secure	51	29.9 ± 0.0	NS
A	*Calidris alba*	Sanderling				S3M,S2N	4 Secure	62	87.2 ± 0.0	NS
A	*Somateria mollissima*	Common Eider				S3S4	4 Secure	28	5.2 ± 0.0	NS
A	*Picoides arcticus*	Black-backed Woodpecker				S3S4	3 Sensitive	23	10.7 ± 7.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
A	*Loxia curvirostra*	Red Crossbill				S3S4	4 Secure	6	30.6 ± 7.0	NS
A	*Sorex palustris*	American Water Shrew				S3S4	4 Secure	13	14.0 ± 1.0	NS
A	*Botaurus lentiginosus*	American Bittern				S3S4B	3 Sensitive	12	10.7 ± 7.0	NS
A	*Anas discors*	Blue-winged Teal				S3S4B	2 May Be At Risk	15	1.8 ± 7.0	NS
A	*Actitis macularius*	Spotted Sandpiper				S3S4B	3 Sensitive	221	1.8 ± 7.0	NS
A	*Empidonax flaviventris*	Yellow-bellied Flycatcher				S3S4B	3 Sensitive	250	1.8 ± 7.0	NS
A	*Regulus calendula*	Ruby-crowned Kinglet				S3S4B	3 Sensitive	564	0.5 ± 0.0	NS
A	*Catharus fuscescens*	Veery				S3S4B	4 Secure	39	1.8 ± 7.0	NS
A	*Catharus ustulatus*	Swainson's Thrush				S3S4B	4 Secure	377	0.5 ± 0.0	NS
A	*Vermivora peregrina*	Tennessee Warbler				S3S4B	3 Sensitive	64	1.8 ± 7.0	NS
A	*Dendroica castanea*	Bay-breasted Warbler				S3S4B	3 Sensitive	66	1.8 ± 7.0	NS
A	*Dendroica striata*	Blackpoll Warbler				S3S4B	3 Sensitive	171	1.8 ± 7.0	NS
A	*Passerella iliaca*	Fox Sparrow				S3S4B	4 Secure	253	0.5 ± 0.0	NS
A	*Coccothraustes vespertinus*	Evening Grosbeak				S3S4B,S3N	4 Secure	80	1.8 ± 7.0	NS
A	*Mergus serrator*	Red-breasted Merganser				S3S4B,S5N	4 Secure	33	10.7 ± 7.0	NS
A	*Bucephala albeola*	Bufflehead				S3S4N	4 Secure	2	91.4 ± 15.0	NS
A	*Leucophaeus atricilla*	Laughing Gull				SHB	4 Secure	1	12.7 ± 0.0	NS
A	*Eremophila alpestris*	Horned Lark				SHB,S4S5N	4 Secure	2	95.9 ± 7.0	NS
A	*Morus bassanus*	Northern Gannet				SHB,S5M	4 Secure	24	2.1 ± 0.0	NS
A	*Aythya americana*	Redhead				SHB,SNAM	4 Secure	1	91.4 ± 15.0	NS
I	*Danaus plexippus*	Monarch	Special Concern	Special Concern		S2B	3 Sensitive	4	7.7 ± 0.0	NS
I	*Bombus terricola*	Yellow-banded Bumblebee	Special Concern			S3	3 Sensitive	1	94.0 ± 0.0	NS
I	*Quedius spelaeus*	Spelean Rove Beetle				S1		1	70.5 ± 1.0	NS
I	*Papilio brevicauda*	Short-tailed Swallowtail				S1	3 Sensitive	26	8.4 ± 1.0	NS
I	*Papilio brevicauda bretonensis*	Short-tailed Swallowtail				S1	1 At Risk	1	60.9 ± 0.0	NS
I	*Somatochlora albicincta*	Ringed Emerald				S1	2 May Be At Risk	7	36.9 ± 1.0	NS
I	*Somatochlora brevicincta*	Quebec Emerald				S1	2 May Be At Risk	7	24.9 ± 1.0	NS
I	*Leucorrhinia patricia*	Canada Whiteface				S1	2 May Be At Risk	1	51.4 ± 0.0	NS
I	*Coenagrion interrogatum*	Subarctic Bluet				S1	2 May Be At Risk	2	76.5 ± 0.0	NS
I	*Polygonia satyrus*	Satyr Comma				S1?	3 Sensitive	1	94.1 ± 1.0	NS
I	*Haematopota rara*	Shy Cleg				S1S3	5 Undetermined	1	41.2 ± 0.0	NS
I	*Boloria chariclea*	Arctic Fritillary				S2	3 Sensitive	8	24.6 ± 1.0	NS
I	*Aglais milberti*	Milbert's Tortoiseshell				S2	4 Secure	1	99.8 ± 1.0	NS
I	*Somatochlora septentrionalis*	Muskeg Emerald				S2	3 Sensitive	28	22.6 ± 1.0	NS
I	*Somatochlora williamsoni*	Williamson's Emerald				S2	2 May Be At Risk	10	84.9 ± 0.0	NS
I	*Margaritifera margaritifera*	Eastern Pearlshell				S2	3 Sensitive	17	29.3 ± 0.0	NS
I	*Pantala hymenaea*	Spot-Winged Glider				S2?B	3 Sensitive	3	19.1 ± 1.0	NS
I	*Thorybes pylades*	Northern Cloudywing				S2S3	3 Sensitive	1	98.1 ± 0.0	NS
I	*Euphydryas phaeton*	Baltimore Checkerspot				S2S3	4 Secure	3	99.8 ± 1.0	NS
I	*Somatochlora forcipata*	Forcipate Emerald				S2S3	2 May Be At Risk	3	24.9 ± 1.0	NS
I	*Speyeria aphrodite*	Aphrodite Fritillary				S3	4 Secure	2	25.1 ± 0.0	NS
I	*Polygonia faunus*	Green Comma				S3	4 Secure	10	10.8 ± 0.0	NS
I	*Oeneis jutta*	Jutta Arctic				S3	2 May Be At Risk	7	23.7 ± 1.0	NS
I	*Somatochlora tenebrosa*	Clamp-Tipped Emerald				S3	4 Secure	2	84.9 ± 0.0	NS
I	*Sympetrum danae*	Black Meadowhawk				S3	3 Sensitive	11	7.6 ± 1.0	NS
I	*Enallagma vernale*	Vernal Bluet				S3	5 Undetermined	7	14.0 ± 1.0	NS
I	*Amphiagrion saucium*	Eastern Red Damsel				S3	4 Secure	15	15.9 ± 0.0	NS
I	*Polygonia interrogationis*	Question Mark				S3B	4 Secure	7	11.2 ± 0.0	NS
I	*Polygonia progne*	Grey Comma				S3S4	4 Secure	6	78.8 ± 0.0	NS
I	*Lanthus parvulus*	Northern Pygmy Clubtail				S3S4	4 Secure	10	41.7 ± 1.0	NS
I	*Lampsilis radiata*	Eastern Lampmussel				S3S4	3 Sensitive	1	86.5 ± 0.0	NS
N	*Peltigera hydrothyria*	Eastern Waterfan	Threatened			S1	2 May Be At Risk	2	11.5 ± 3.0	NS
N	*Sclerophora peronella (Nova Scotia pop.)*	Frosted Glass-whiskers Lichen - Nova Scotia pop.	Special Concern	Special Concern		S1?		4	65.6 ± 0.0	NS
N	*Degelia plumbea*	Blue Felt Lichen	Special Concern	Special Concern	Vulnerable	S3	4 Secure	1	89.8 ± 0.0	NS
N	*Gowardia nigricans*	Gray Witch's Beard Lichen				S1	6 Not Assessed	1	37.4 ± 1.0	NS
N	*Metacalypogeia schusterana*	Schuster's Pouchwort				S1?	5 Undetermined	1	96.9 ± 0.0	NS

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N	*Moerckia hibernica*	Irish Ruffwort				S1?		1	96.9 ± 0.0	NS
N	*Conardia compacta*	Coast Creeping Moss				S1?	3 Sensitive	1	79.7 ± 5.0	NS
N	*Dicranum elongatum*	Long-forked Broom Moss				S1?	3 Sensitive	3	19.7 ± 0.0	NS
N	*Dicranum groenlandicum*	Mountain Broom Moss				S1?	3 Sensitive	1	19.7 ± 0.0	NS
N	*Entodon concinnus*	Lime Entodon Moss				S1?	3 Sensitive	2	43.2 ± 0.0	NS
N	*Grimmia laevigata*	a Moss				S1?	3 Sensitive	2	50.4 ± 0.0	NS
N	*Grimmia pilifera*	a Moss				S1?	3 Sensitive	2	43.4 ± 0.0	NS
N	*Hygrohypnum smithii*	Smith's Brook Moss				S1?	3 Sensitive	1	43.8 ± 0.0	NS
N	*Orthothecium strictum*	Shiny Erect-capsule Moss				S1?	3 Sensitive	2	43.2 ± 0.0	NS
N	*Paludella squarrosa*	Tufted Fen Moss				S1?	3 Sensitive	1	96.1 ± 5.0	NS
N	*Seligeria recurvata*	a Moss				S1?	3 Sensitive	1	23.5 ± 1.0	NS
N	*Seligeria tristichoides*	a Moss				S1?	3 Sensitive	1	23.5 ± 1.0	NS
N	*Timmia norvegica*	a moss				S1?	3 Sensitive	1	30.0 ± 50.0	NS
N	*Syntrichia ruralis*	a Moss				S1?	3 Sensitive	1	69.2 ± 1.0	NS
N	*Ulota curvifolia*	a Moss				S1?	3 Sensitive	1	50.4 ± 0.0	NS
N	*Plagiomnium ellipticum*	Marsh Leafy Moss				S1?	2 May Be At Risk	1	44.7 ± 2.0	NS
N	*Flavocetraria nivalis*	Crinkled Snow Lichen				S1?	3 Sensitive	1	56.7 ± 0.0	NS
N	*Aulacomnium heterostichum*	One-sided Groove Moss				S1S2	3 Sensitive	1	3.2 ± 1.0	NS
N	*Buxbaumia minakatae*	Hump-Backed Elves				S1S2	3 Sensitive	2	24.7 ± 0.0	NS
N	*Ctenidium molluscum*	Mollusc Ctenidium moss				S1S2		1	51.2 ± 1.0	NS
N	*Dicranodontium denudatum*	Beaked Bow Moss				S1S2	3 Sensitive	3	19.7 ± 0.0	NS
N	*Dicranoweisia crispula*	Mountain Thatch Moss				S1S2	3 Sensitive	1	50.3 ± 0.0	NS
N	*Didymodon ferrugineus*	a moss				S1S2	3 Sensitive	3	9.4 ± 2.0	NS
N	*Hygrohypnum montanum*	a Moss				S1S2	3 Sensitive	2	24.7 ± 0.0	NS
N	*Hypnum pratense*	Meadow Plait Moss				S1S2	3 Sensitive	1	19.8 ± 1.0	NS
N	*Mnium thomsonii*	Thomson's Leafy Moss				S1S2	3 Sensitive	2	28.2 ± 0.0	NS
N	*Plagiobryum zieri*	a Moss				S1S2	3 Sensitive	6	43.2 ± 0.0	NS
N	*Platydictya confervoides*	a Moss				S1S2	3 Sensitive	1	88.2 ± 3.0	NS
N	*Seligeria calcarea*	Chalk Brittle Moss				S1S2	3 Sensitive	2	28.2 ± 0.0	NS
N	*Tetrodontium brownianum*	Little Georgia				S1S2	3 Sensitive	1	24.7 ± 0.0	NS
N	*Timmia megapolitana*	Metropolitan Timmia Moss				S1S2	3 Sensitive	1	3.9 ± 0.0	NS
N	*Hamatocaulis vernicosus*	a Moss				S1S2	3 Sensitive	1	50.3 ± 0.0	NS
N	*Schistidium trichodon*	a Moss				S1S2	3 Sensitive	2	26.6 ± 3.0	NS
N	*Massalongia carnosa*	Rockmoss Rosette Lichen				S1S2	2 May Be At Risk	1	12.1 ± 2.0	NS
N	*Anacamptodon splachnoides*	a Moss				S2?	3 Sensitive	2	24.7 ± 0.0	NS
N	*Anomodon viticulosus*	a Moss				S2?	3 Sensitive	7	26.6 ± 3.0	NS
N	*Atrichum angustatum*	Lesser Smoothcap Moss				S2?	3 Sensitive	2	44.9 ± 1.0	NS
N	*Bryum algovicum*	a Moss				S2?	3 Sensitive	2	25.0 ± 0.0	NS
N	*Campylium polygamum*	a Moss				S2?	5 Undetermined	1	30.7 ± 2.0	NS
N	*Campylium radicale*	Long-stalked Fine Wet Moss				S2?	5 Undetermined	1	15.9 ± 0.0	NS
N	*Fontinalis hypnoides*	a moss				S2?	5 Undetermined	2	41.4 ± 1.0	NS
N	*Fontinalis sullivantii*	a Moss				S2?	3 Sensitive	1	92.6 ± 100.0	NS
N	*Grimmia anomala*	Mountain Forest Grimmia				S2?	3 Sensitive	3	41.4 ± 1.0	NS
N	*Hygrohypnum bestii*	Best's Brook Moss				S2?	3 Sensitive	2	21.9 ± 0.0	NS
N	*Kiaeria blyttii*	Blytt's Fork Moss				S2?	3 Sensitive	8	24.7 ± 0.0	NS
N	*Kiaeria starkei*	Starke's Fork Moss				S2?	3 Sensitive	6	20.8 ± 0.0	NS
N	*Orthotrichum anomalum*	Anomalous Bristle Moss				S2?	3 Sensitive	1	50.4 ± 0.0	NS
N	*Philonotis marchica*	a Moss				S2?	5 Undetermined	2	26.6 ± 3.0	NS
N	*Platydictya jungermannioides*	False Willow Moss				S2?	3 Sensitive	3	26.6 ± 3.0	NS
N	*Pseudoleskea patens*	Patent Leskea Moss				S2?	3 Sensitive	5	19.9 ± 0.0	NS
N	*Pseudoleskea stenophylla*	Narrow-leaved Leskea Moss				S2?	3 Sensitive	7	20.0 ± 0.0	NS
N	*Racomitrium affine*	a Moss				S2?	5 Undetermined	2	24.7 ± 0.0	NS
N	*Rhytidium rugosum*	Wrinkle-leaved Moss				S2?	3 Sensitive	4	43.4 ± 0.0	NS
N	*Saelania glaucescens*	Blue Dew Moss				S2?	3 Sensitive	1	24.1 ± 0.0	NS
N	*Seligeria donniana*	Donian Beardless Moss				S2?	3 Sensitive	3	28.2 ± 0.0	NS
N	*Sematophyllum marylandicum*	a Moss				S2?	3 Sensitive	5	24.7 ± 0.0	NS
N	*Sphagnum subnitens*	Lustrous Peat Moss				S2?	3 Sensitive	1	22.4 ± 5.0	NS

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N	*Tetraplodon angustatus*	Toothed-leaved Nitrogen Moss				S2?	3 Sensitive	2	37.2 ± 0.0	NS
N	*Tortella fragilis*	Fragile Twisted Moss				S2?	3 Sensitive	7	26.9 ± 0.0	NS
N	*Anomobryum filiforme*	a moss				S2?		5	29.9 ± 50.0	NS
N	*Cyrtomnium hymenophylloides*	Short-pointed Lantern Moss				S2?	3 Sensitive	6	43.2 ± 0.0	NS
N	*Platylomella lescurii*	a Moss				S2?	3 Sensitive	2	21.9 ± 0.0	NS
N	*Platydictya subtilis*	Bark Willow Moss				S2S3	3 Sensitive	1	35.1 ± 0.0	NS
N	*Tetraplodon mnioides*	Entire-leaved Nitrogen Moss				S2S3	4 Secure	9	35.6 ± 0.0	NS
N	*Limprichtia revolvens*	a Moss				S2S3	3 Sensitive	2	15.9 ± 0.0	NS
N	*Cetraria muricata*	Spiny Heath Lichen				S2S3	5 Undetermined	4	25.2 ± 1.0	NS
N	*Drummondia prorepens*	a Moss				S3?	3 Sensitive	5	29.9 ± 5.0	NS
N	*Anomodon tristis*	a Moss				S3?	3 Sensitive	2	52.1 ± 0.0	NS
N	*Mnium stellare*	Star Leafy Moss				S3?	5 Undetermined	2	29.8 ± 0.0	NS
N	*Cladonia pocillum*	Rosette Pixie-cup Lichen				S3?	3 Sensitive	1	8.7 ± 1.0	NS
N	*Anomodon rugelii*	Rugel's Anomodon Moss				S3S4	3 Sensitive	1	29.8 ± 0.0	NS
N	*Dicranum leioneuron*	a Dicranum Moss				S3S4	4 Secure	10	22.0 ± 5.0	NS
N	*Encalypta procera*	Slender Extinguisher Moss				S3S4	4 Secure	4	9.4 ± 2.0	NS
N	*Myurella julacea*	Small Mouse-tail Moss				S3S4	3 Sensitive	4	10.5 ± 1.0	NS
N	*Splachnum ampullaceum*	Cruet Dung Moss				S3S4	4 Secure	2	31.7 ± 0.0	NS
N	*Thamnobryum alleghaniense*	a Moss				S3S4	3 Sensitive	6	21.9 ± 0.0	NS
N	*Schistidium agassizii*	Elf Bloom Moss				S3S4	4 Secure	4	44.9 ± 1.0	NS
N	*Arctoparmelia incurva*	Finger Ring Lichen				S3S4	4 Secure	3	37.4 ± 1.0	NS
N	*Cladonia floerkeana*	Gritty British Soldiers Lichen				S3S4	5 Undetermined	1	83.1 ± 0.0	NS
P	*Isoetes prototypus*	Prototype Quillwort	Special Concern	Special Concern	Vulnerable	S2	3 Sensitive	13	85.5 ± 0.0	NS
P	*Floerkea proserpinacoides*	False Mermaidweed	Not At Risk			S2	3 Sensitive	5	69.2 ± 0.0	NS
P	*Acer saccharinum*	Silver Maple				S1	5 Undetermined	1	93.8 ± 0.0	NS
P	*Osmorhiza depauperata*	Blunt Sweet Cicely				S1	2 May Be At Risk	3	7.8 ± 0.0	NS
P	*Sanicula odorata*	Clustered Sanicle				S1	2 May Be At Risk	4	93.4 ± 1.0	NS
P	*Arnica lonchophylla*	Northern Arnica				S1	2 May Be At Risk	10	22.1 ± 7.0	NS
P	*Artemisia campestris var. borealis*	Field Wormwood				S1	2 May Be At Risk	1	16.2 ± 0.0	NS
P	*Artemisia campestris ssp. borealis*	Field Wormwood				S1	2 May Be At Risk	7	7.6 ± 0.0	NS
P	*Bidens hyperborea*	Estuary Beggarticks				S1	2 May Be At Risk	2	78.2 ± 1.0	NS
P	*Prenanthes racemosa*	Glaucous Rattlesnakeroot				S1	2 May Be At Risk	1	83.7 ± 3.0	NS
P	*Betula glandulosa*	Glandular Birch				S1	2 May Be At Risk	5	34.1 ± 0.0	NS
P	*Cardamine pratensis var. angustifolia*	Cuckoo Flower				S1	2 May Be At Risk	2	59.0 ± 2.0	NS
P	*Draba glabella*	Rock Whitlow-Grass				S1	2 May Be At Risk	4	8.8 ± 3.0	NS
P	*Draba norvegica var. clivicola*	Norwegian Whitlow-Grass				S1	2 May Be At Risk	9	7.8 ± 7.0	NS
P	*Draba pycnosperma*	Dense Whitlow-grass				S1	2 May Be At Risk	1	7.8 ± 1.0	NS
P	*Silene acaulis var. exscapa*	Moss Campion				S1	2 May Be At Risk	7	32.4 ± 0.0	NS
P	*Suaeda maritima ssp. richii*	White Sea-blite				S1	5 Undetermined	1	8.8 ± 0.0	NS
P	*Diapensia lapponica*	Diapensia				S1	2 May Be At Risk	10	7.6 ± 0.0	NS
P	*Loiseleuria procumbens*	Alpine Azalea				S1	2 May Be At Risk	1	36.6 ± 0.0	NS
P	*Phyllodoce caerulea*	Blue Mountain Heather				S1	2 May Be At Risk	4	7.8 ± 1.0	NS
P	*Vaccinium ovalifolium*	Oval-leaved Bilberry				S1	2 May Be At Risk	14	7.7 ± 2.0	NS
P	*Gentianella amarella ssp. acuta*	Northern Gentian				S1	2 May Be At Risk	3	9.1 ± 1.0	NS
P	*Pinguicula vulgaris*	Common Butterwort				S1	2 May Be At Risk	8	29.1 ± 0.0	NS
P	*Utricularia ochroleuca*	Yellowish-white Bladderwort				S1	5 Undetermined	2	34.3 ± 0.0	NS
P	*Oxyria digyna*	Mountain Sorrel				S1	2 May Be At Risk	8	28.9 ± 0.0	NS
P	*Polygonum viviparum*	Alpine Bistort				S1	2 May Be At Risk	1	16.9 ± 0.0	NS
P	*Anemone multifida*	Cut-leaved Anemone				S1	2 May Be At Risk	4	44.8 ± 1.0	NS
P	*Potentilla pensylvanica var. litoralis*	Pennsylvania Cinquefoil				S1	0.1 Extirpated	4	45.3 ± 1.0	NS
P	*Salix glauca ssp. callicarpaea*	Gray Willow				S1	2 May Be At Risk	6	33.3 ± 0.0	NS
P	*Salix uva-ursi*	Bearberry Willow				S1	2 May Be At Risk	4	36.6 ± 0.0	NS
P	*Salix vestita*	Hairy Willow				S1	2 May Be At Risk	1	43.2 ± 0.0	NS
P	*Saxifraga aizoides*	Yellow Mountain Saxifrage				S1	2 May Be At Risk	9	13.4 ± 7.0	NS
P	*Saxifraga cernua*	Nodding Saxifrage				S1	2 May Be At Risk	2	15.6 ± 0.0	NS
P	*Saxifraga oppositifolia*	Purple Mountain Saxifrage				S1	2 May Be At Risk	3	16.2 ± 0.0	NS
P	*Pedicularis palustris*	Marsh Lousewort				S1	2 May Be At Risk	6	2.7 ± 0.0	NS

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P	*Rhinanthus minor ssp. groenlandicus*	Little Yellow Rattle				S1	2 May Be At Risk	3	3.2 ± 1.0	NS
P	*Scrophularia lanceolata*	Lance-leaved Figwort				S1	5 Undetermined	1	95.7 ± 1.0	NS
P	*Carex gynocrates*	Northern Bog Sedge				S1	2 May Be At Risk	2	34.5 ± 5.0	NS
P	*Carex saxatilis*	Russet Sedge				S1	2 May Be At Risk	7	29.0 ± 0.0	NS
P	*Carex viridula ssp. brachyrrhyncha*	Greenish Sedge				S1	2 May Be At Risk	2	33.7 ± 0.0	NS
P	*Eleocharis erythropoda*	Red-stemmed Spikerush				S1	2 May Be At Risk	4	80.1 ± 25.0	NS
P	*Rhynchospora capillacea*	Slender Beakrush				S1	2 May Be At Risk	2	95.6 ± 0.0	NS
P	*Blysmus rufus*	Red Bulrush				S1	2 May Be At Risk	6	6.8 ± 0.0	NS
P	*Luzula spicata*	Spiked Woodrush				S1	2 May Be At Risk	13	2.6 ± 5.0	NS
P	*Triantha glutinosa*	Sticky False-Asphodel				S1	2 May Be At Risk	1	53.6 ± 1.0	NS
P	*Calamagrostis stricta ssp. inexpansa*	Slim-stemmed Reed Grass				S1	3 Sensitive	1	7.8 ± 5.0	NS
P	*Elymus wiegandii*	Wiegand's Wild Rye				S1	2 May Be At Risk	7	78.0 ± 0.0	NS
P	*Festuca altaica*	Northern Rough Fescue				S1	2 May Be At Risk	3	16.9 ± 0.0	NS
P	*Hordeum brachyantherum*	Meadow Barley				S1	2 May Be At Risk	2	16.6 ± 0.0	NS
P	*Phleum alpinum*	Alpine Timothy				S1	2 May Be At Risk	7	45.4 ± 1.0	NS
P	*Trisetum melicoides*	Purple False Oats				S1	2 May Be At Risk	4	49.4 ± 7.0	NS
P	*Adiantum pedatum*	Northern Maidenhair Fern				S1	2 May Be At Risk	2	2.9 ± 5.0	NS
P	*Botrychium lunaria*	Common Moonwort				S1	2 May Be At Risk	3	17.7 ± 5.0	NS
P	*Halenia deflexa ssp. brentoniana*	Spurred Gentian				S1?	5 Undetermined	3	2.7 ± 0.0	NS
P	*Epilobium lactiflorum*	White-flowered Willowherb				S1?	2 May Be At Risk	1	30.0 ± 5.0	NS
P	*Spiraea septentrionalis*	Northern Meadowsweet				S1?	2 May Be At Risk	4	14.6 ± 5.0	NS
P	*Carex rostrata*	Narrow-leaved Beaked Sedge				S1?	2 May Be At Risk	3	33.7 ± 0.0	NS
P	*Schoenoplectus robustus*	Sturdy Bulrush				S1?	5 Undetermined	1	99.6 ± 5.0	NS
P	*Dichanthelium acuminatum var. lindheimeri*	Woolly Panic Grass				S1?	5 Undetermined	1	29.1 ± 1.0	NS
P	*Huperzia selago*	Northern Firmoss				S1?	2 May Be At Risk	3	33.7 ± 0.0	NS
P	*Fraxinus nigra*	Black Ash			Threatened	S1S2	1 At Risk	16	12.5 ± 0.0	NS
P	*Betula minor*	Dwarf White Birch				S1S2	3 Sensitive	1	6.0 ± 1.0	NS
P	*Arabis hirsuta var. pycnocarpa*	Western Hairy Rockcress				S1S2	2 May Be At Risk	11	13.0 ± 1.0	NS
P	*Cornus suecica*	Swedish Bunchberry				S1S2	3 Sensitive	3	33.4 ± 0.0	NS
P	*Anemone virginiana var. alba*	Virginia Anemone				S1S2	3 Sensitive	5	7.7 ± 1.0	NS
P	*Ranunculus sceleratus*	Cursed Buttercup				S1S2	2 May Be At Risk	1	93.9 ± 7.0	NS
P	*Parnassia palustris var. parviflora*	Marsh Grass-of-Parnassus				S1S2	2 May Be At Risk	7	30.2 ± 4.0	NS
P	*Juncus alpinoarticulatus ssp. nodulosus*	Richardson's Rush				S1S2	2 May Be At Risk	3	42.3 ± 1.0	NS
P	*Juncus bulbosus*	Bulbous Rush				S1S2	5 Undetermined	4	91.6 ± 0.0	NS
P	*Platanthera huronensis*	Fragrant Green Orchid				S1S2	5 Undetermined	1	70.5 ± 10.0	NS
P	*Calamagrostis stricta ssp. stricta*	Slim-stemmed Reed Grass				S1S2	3 Sensitive	1	96.2 ± 1.0	NS
P	*Festuca subverticillata*	Nodding Fescue				S1S2	2 May Be At Risk	72	16.3 ± 0.0	NS
P	*Festuca prolifera*	Proliferous Fescue				S1S2	3 Sensitive	7	10.9 ± 0.0	NS
P	*Sparganium hyperboreum*	Northern Burreed				S1S2	3 Sensitive	5	41.6 ± 10.0	NS
P	*Woodsia alpina*	Alpine Cliff Fern				S1S2	2 May Be At Risk	11	13.4 ± 7.0	NS
P	*Selaginella selaginoides*	Low Spikemoss				S1S2	2 May Be At Risk	5	11.9 ± 0.0	NS
P	*Carex vacillans*	Estuarine Sedge				S1S3	5 Undetermined	3	9.2 ± 0.0	NS
P	*Conioselinum chinense*	Chinese Hemlock-parsley				S2	3 Sensitive	4	30.8 ± 2.0	NS
P	*Osmorhiza longistylis*	Smooth Sweet Cicely				S2	2 May Be At Risk	13	18.3 ± 0.0	NS
P	*Erigeron philadelphicus*	Philadelphia Fleabane				S2	3 Sensitive	3	37.1 ± 7.0	NS
P	*Solidago multiradiata*	Multi-rayed Goldenrod				S2	2 May Be At Risk	13	16.3 ± 0.0	NS
P	*Symphyotrichum ciliolatum*	Fringed Blue Aster				S2	3 Sensitive	1	71.6 ± 7.0	NS
P	*Impatiens pallida*	Pale Jewelweed				S2	3 Sensitive	2	10.7 ± 7.0	NS
P	*Caulophyllum thalictroides*	Blue Cohosh				S2	2 May Be At Risk	5	77.4 ± 0.0	NS
P	*Betula borealis*	Northern Birch				S2	3 Sensitive	13	3.9 ± 1.0	NS
P	*Arabis drummondii*	Drummond's Rockcress				S2	3 Sensitive	11	7.7 ± 0.0	NS
P	*Cardamine parviflora var. arenicola*	Small-flowered Bittercress				S2	3 Sensitive	9	37.1 ± 0.0	NS
P	*Draba arabisans*	Rock Whitlow-Grass				S2	3 Sensitive	21	3.7 ± 0.0	NS
P	*Lobelia kalmii*	Brook Lobelia				S2	2 May Be At Risk	3	94.3 ± 1.0	NS
P	*Chenopodium rubrum*	Red Pigweed				S2	2 May Be At Risk	2	94.5 ± 2.0	NS

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P	*Hudsonia ericoides*	Pinebarren Golden Heather				S2	3 Sensitive	3	17.2 ± 0.0	NS
P	*Hypericum majus*	Large St John's-wort				S2	3 Sensitive	1	95.6 ± 0.0	NS
P	*Oxytropis campestris var. johannensis*	Field Locoweed				S2	2 May Be At Risk	17	16.3 ± 0.0	NS
P	*Myriophyllum verticillatum*	Whorled Water Milfoil				S2	3 Sensitive	2	53.5 ± 0.0	NS
P	*Rumex salicifolius var. mexicanus*	Triangular-valve Dock				S2	3 Sensitive	6	76.0 ± 90.0	NS
P	*Primula mistassinica*	Mistassini Primrose				S2	3 Sensitive	23	7.7 ± 0.0	NS
P	*Anemone canadensis*	Canada Anemone				S2	2 May Be At Risk	12	2.7 ± 0.0	NS
P	*Anemone quinquefolia*	Wood Anemone				S2	3 Sensitive	5	8.3 ± 1.0	NS
P	*Anemone virginiana*	Virginia Anemone				S2	3 Sensitive	2	8.6 ± 0.0	NS
P	*Caltha palustris*	Yellow Marsh Marigold				S2	3 Sensitive	28	5.1 ± 0.0	NS
P	*Galium labradoricum*	Labrador Bedstraw				S2	3 Sensitive	5	2.9 ± 5.0	NS
P	*Comandra umbellata*	Bastard's Toadflax				S2	2 May Be At Risk	21	8.3 ± 0.0	NS
P	*Saxifraga paniculata ssp. neogaea*	White Mountain Saxifrage				S2	3 Sensitive	25	7.6 ± 0.0	NS
P	*Viola nephrophylla*	Northern Bog Violet				S2	3 Sensitive	2	56.5 ± 2.0	NS
P	*Carex atratiformis*	Scabrous Black Sedge				S2	3 Sensitive	19	3.7 ± 1.0	NS
P	*Carex bebbii*	Bebb's Sedge				S2	3 Sensitive	7	87.8 ± 0.0	NS
P	*Carex capillaris*	Hairlike Sedge				S2	3 Sensitive	23	7.8 ± 1.0	NS
P	*Carex castanea*	Chestnut Sedge				S2	2 May Be At Risk	10	12.8 ± 5.0	NS
P	*Carex hystericina*	Porcupine Sedge				S2	2 May Be At Risk	7	87.7 ± 0.0	NS
P	*Carex scirpoidea*	Scirpuslike Sedge				S2	3 Sensitive	20	7.6 ± 0.0	NS
P	*Carex tuckermanii*	Tuckerman's Sedge				S2	3 Sensitive	2	92.2 ± 0.0	NS
P	*Eleocharis quinqueflora*	Few-flowered Spikerush				S2	3 Sensitive	5	9.7 ± 0.0	NS
P	*Vallisneria americana*	Wild Celery				S2	2 May Be At Risk	2	68.2 ± 10.0	NS
P	*Juncus stygius ssp. americanus*	Moor Rush				S2	3 Sensitive	7	7.6 ± 1.0	NS
P	*Allium schoenoprasum*	Wild Chives				S2	2 May Be At Risk	1	94.0 ± 0.0	NS
P	*Allium schoenoprasum var. sibiricum*	Wild Chives				S2	2 May Be At Risk	4	42.5 ± 5.0	NS
P	*Lilium canadense*	Canada Lily				S2	2 May Be At Risk	4	91.2 ± 1.0	NS
P	*Cypripedium parviflorum var. pubescens*	Yellow Lady's-slipper				S2	3 Sensitive	2	24.9 ± 0.0	NS
P	*Cypripedium parviflorum var. makasin*	Small Yellow Lady's-Slipper				S2	3 Sensitive	7	9.5 ± 0.0	NS
P	*Cypripedium reginae*	Showy Lady's-Slipper				S2	2 May Be At Risk	11	3.3 ± 0.0	NS
P	*Platanthera macrophylla*	Large Round-Leaved Orchid				S2	3 Sensitive	1	23.6 ± 0.0	NS
P	*Calamagrostis stricta*	Slim-stemmed Reed Grass				S2	3 Sensitive	1	8.6 ± 0.0	NS
P	*Piptatherum canadense*	Canada Rice Grass				S2	3 Sensitive	1	51.4 ± 0.0	NS
P	*Potamogeton richardsonii*	Richardson's Pondweed				S2	2 May Be At Risk	2	40.6 ± 7.0	NS
P	*Cystopteris laurentiana*	Laurentian Bladder Fern				S2	2 May Be At Risk	21	9.4 ± 5.0	NS
P	*Dryopteris fragrans var. remotiuscula*	Fragrant Wood Fern				S2	3 Sensitive	11	24.8 ± 0.0	NS
P	*Polystichum lonchitis*	Northern Holly Fern				S2	3 Sensitive	42	2.9 ± 5.0	NS
P	*Woodsia glabella*	Smooth Cliff Fern				S2	3 Sensitive	22	7.8 ± 0.0	NS
P	*Crataegus submollis*	Quebec Hawthorn				S2?	5 Undetermined	3	10.7 ± 7.0	NS
P	*Eleocharis ovata*	Ovate Spikerush				S2?	3 Sensitive	1	91.4 ± 0.0	NS
P	*Hieracium robinsonii*	Robinson's Hawkweed				S2S3	3 Sensitive	43	13.8 ± 1.0	NS
P	*Iva frutescens ssp. oraria*	Big-leaved Marsh-elder				S2S3	3 Sensitive	1	95.2 ± 4.0	NS
P	*Senecio pseudoarnica*	Seabeach Ragwort				S2S3	3 Sensitive	6	67.5 ± 0.0	NS
P	*Betula michauxii*	Michaux's Dwarf Birch				S2S3	3 Sensitive	3	13.4 ± 7.0	NS
P	*Triosteum aurantiacum*	Orange-fruited Tinker's Weed				S2S3	3 Sensitive	29	9.8 ± 0.0	NS
P	*Shepherdia canadensis*	Soapberry				S2S3	3 Sensitive	210	7.8 ± 0.0	NS
P	*Empetrum eamesii ssp. atropurpureum*	Pink Crowberry				S2S3	3 Sensitive	11	5.1 ± 1.0	NS
P	*Empetrum eamesii ssp. eamesii*	Pink Crowberry				S2S3	3 Sensitive	8	9.0 ± 2.0	NS
P	*Halenia deflexa*	Spurred Gentian				S2S3	3 Sensitive	9	8.9 ± 1.0	NS
P	*Hedeoma pulegioides*	American False Pennyroyal				S2S3	3 Sensitive	1	95.0 ± 1.0	NS
P	*Polygonum buxiforme*	Small's Knotweed				S2S3	5 Undetermined	1	77.4 ± 7.0	NS
P	*Polygonum raii*	Sharp-fruited Knotweed				S2S3	5 Undetermined	5	34.2 ± 5.0	NS
P	*Amelanchier fernaldii*	Fernald's Serviceberry				S2S3	5 Undetermined	4	34.9 ± 0.0	NS

Taxonomic Group	Scientific Name	Common Name	COSEWIC	SARA	Prov Legal Prot	Prov Rarity Rank	Prov GS Rank	# recs	Distance (km)	Prov
P	*Galium aparine*	Common Bedstraw				S2S3	3 Sensitive	8	16.6 ± 0.0	NS
P	*Salix pellita*	Satiny Willow				S2S3	3 Sensitive	6	2.6 ± 1.0	NS
P	*Veronica serpyllifolia ssp. humifusa*	Thyme-Leaved Speedwell				S2S3	3 Sensitive	25	7.7 ± 0.0	NS
P	*Carex adusta*	Lesser Brown Sedge				S2S3	3 Sensitive	7	12.6 ± 7.0	NS
P	*Eriophorum gracile*	Slender Cottongrass				S2S3	3 Sensitive	2	2.9 ± 5.0	NS
P	*Juncus trifidus*	Highland Rush				S2S3	3 Sensitive	36	2.9 ± 2.0	NS
P	*Coeloglossum viride var. virescens*	Long-bracted Frog Orchid				S2S3	2 May Be At Risk	34	3.3 ± 1.0	NS
P	*Cypripedium parviflorum*	Yellow Lady's-slipper				S2S3	3 Sensitive	18	24.9 ± 0.0	NS
P	*Poa glauca*	Glaucous Blue Grass				S2S3	3 Sensitive	26	7.8 ± 1.0	NS
P	*Stuckenia filiformis ssp. alpina*	Thread-leaved Pondweed				S2S3	3 Sensitive	15	13.0 ± 1.0	NS
P	*Botrychium lanceolatum var. angustisegmentum*	Lance-Leaf Grape-Fern				S2S3	3 Sensitive	9	6.6 ± 0.0	NS
P	*Botrychium simplex*	Least Moonwort				S2S3	3 Sensitive	8	11.3 ± 0.0	NS
P	*Ophioglossum pusillum*	Northern Adder's-tongue				S2S3	3 Sensitive	1	88.2 ± 5.0	NS
P	*Angelica atropurpurea*	Purple-stemmed Angelica				S3	4 Secure	13	7.1 ± 4.0	NS
P	*Erigeron hyssopifolius*	Hyssop-leaved Fleabane				S3	3 Sensitive	107	7.7 ± 0.0	NS
P	*Erigeron hyssopifolius var. hyssopifolius*	Daisy Fleabane				S3	3 Sensitive	1	93.9 ± 0.0	NS
P	*Megalodonta beckii*	Water Beggarticks				S3	4 Secure	2	68.5 ± 0.0	NS
P	*Packera paupercula*	Balsam Groundsel				S3	4 Secure	56	8.4 ± 1.0	NS
P	*Betula pumila*	Bog Birch				S3	3 Sensitive	45	15.1 ± 0.0	NS
P	*Betula pumila var. pumila*	Bog Birch				S3	3 Sensitive	5	26.4 ± 0.0	NS
P	*Minuartia groenlandica*	Greenland Stitchwort				S3	3 Sensitive	1	44.7 ± 0.0	NS
P	*Viburnum edule*	Squashberry				S3	3 Sensitive	81	2.3 ± 0.0	NS
P	*Empetrum eamesii*	Pink Crowberry				S3	3 Sensitive	43	2.7 ± 0.0	NS
P	*Vaccinium boreale*	Northern Blueberry				S3	3 Sensitive	51	3.4 ± 0.0	NS
P	*Vaccinium caespitosum*	Dwarf Bilberry				S3	4 Secure	27	35.2 ± 0.0	NS
P	*Vaccinium uliginosum*	Alpine Bilberry				S3	3 Sensitive	45	1.8 ± 7.0	NS
P	*Proserpinaca palustris*	Marsh Mermaidweed				S3	4 Secure	1	98.9 ± 0.0	NS
P	*Teucrium canadense*	Canada Germander				S3	3 Sensitive	5	84.8 ± 0.0	NS
P	*Decodon verticillatus*	Swamp Loosestrife				S3	4 Secure	2	98.6 ± 0.0	NS
P	*Epilobium hornemannii*	Hornemann's Willowherb				S3	4 Secure	75	5.0 ± 3.0	NS
P	*Epilobium strictum*	Downy Willowherb				S3	3 Sensitive	4	3.2 ± 0.0	NS
P	*Polygala sanguinea*	Blood Milkwort				S3	3 Sensitive	1	61.1 ± 7.0	NS
P	*Polygonum pensylvanicum*	Pennsylvania Smartweed				S3	4 Secure	2	30.4 ± 0.0	NS
P	*Plantago rugelii*	Rugel's Plantain				S3	4 Secure	2	18.6 ± 0.0	NS
P	*Primula laurentiana*	Laurentian Primrose				S3	4 Secure	1	76.0 ± 7.0	NS
P	*Pyrola asarifolia*	Pink Pyrola				S3	4 Secure	95	7.7 ± 0.0	NS
P	*Pyrola minor*	Lesser Pyrola				S3	3 Sensitive	25	6.1 ± 4.0	NS
P	*Ranunculus gmelinii*	Gmelin's Water Buttercup				S3	4 Secure	17	86.9 ± 0.0	NS
P	*Rhamnus alnifolia*	Alder-leaved Buckthorn				S3	4 Secure	2	96.1 ± 0.0	NS
P	*Agrimonia gryposepala*	Hooked Agrimony				S3	4 Secure	62	12.6 ± 0.0	NS
P	*Amelanchier stolonifera*	Running Serviceberry				S3	4 Secure	6	8.7 ± 1.0	NS
P	*Galium kamtschaticum*	Northern Wild Licorice				S3	4 Secure	94	3.2 ± 0.0	NS
P	*Geocaulon lividum*	Northern Comandra				S3	4 Secure	26	7.7 ± 1.0	NS
P	*Limosella australis*	Southern Mudwort				S3	4 Secure	2	77.3 ± 0.0	NS
P	*Laportea canadensis*	Canada Wood Nettle				S3	3 Sensitive	6	76.6 ± 0.0	NS
P	*Carex cryptolepis*	Hidden-scaled Sedge				S3	4 Secure	6	9.2 ± 0.0	NS
P	*Carex eburnea*	Bristle-leaved Sedge				S3	3 Sensitive	104	7.8 ± 5.0	NS
P	*Carex rosea*	Rosy Sedge				S3	4 Secure	4	7.4 ± 5.0	NS
P	*Carex tribuloides*	Blunt Broom Sedge				S3	4 Secure	2	94.5 ± 0.0	NS
P	*Carex wiegandii*	Wiegand's Sedge				S3	3 Sensitive	57	7.7 ± 0.0	NS
P	*Carex foenea*	Fernald's Hay Sedge				S3	4 Secure	6	17.6 ± 0.0	NS
P	*Elodea canadensis*	Canada Waterweed				S3	4 Secure	4	98.2 ± 0.0	NS
P	*Juncus subcaudatus var. planisepalus*	Woods-Rush				S3	3 Sensitive	1	98.0 ± 0.0	NS
P	*Juncus dudleyi*	Dudley's Rush				S3	4 Secure	2	56.4 ± 2.0	NS

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P	*Goodyera oblongifolia*	Menzies' Rattlesnake-plantain				S3	3 Sensitive	45	3.7 ± 1.0	NS
P	*Goodyera repens*	Lesser Rattlesnake-plantain				S3	3 Sensitive	10	33.4 ± 0.0	NS
P	*Platanthera grandiflora*	Large Purple Fringed Orchid				S3	4 Secure	3	34.5 ± 0.0	NS
P	*Platanthera hookeri*	Hooker's Orchid				S3	4 Secure	6	8.7 ± 5.0	NS
P	*Platanthera orbiculata*	Small Round-leaved Orchid				S3	4 Secure	16	7.8 ± 5.0	NS
P	*Alopecurus aequalis*	Short-awned Foxtail				S3	4 Secure	11	52.7 ± 1.0	NS
P	*Potamogeton obtusifolius*	Blunt-leaved Pondweed				S3	4 Secure	6	63.2 ± 0.0	NS
P	*Potamogeton praelongus*	White-stemmed Pondweed				S3	3 Sensitive	6	64.9 ± 1.0	NS
P	*Potamogeton zosteriformis*	Flat-stemmed Pondweed				S3	3 Sensitive	5	68.2 ± 0.0	NS
P	*Sparganium natans*	Small Burreed				S3	4 Secure	3	9.8 ± 0.0	NS
P	*Asplenium trichomanes*	Maidenhair Spleenwort				S3	4 Secure	42	3.4 ± 1.0	NS
P	*Asplenium trichomanes-ramosum*	Green Spleenwort				S3	3 Sensitive	18	8.6 ± 0.0	NS
P	*Equisetum pratense*	Meadow Horsetail				S3	3 Sensitive	43	7.7 ± 0.0	NS
P	*Equisetum variegatum*	Variegated Horsetail				S3	4 Secure	14	9.4 ± 0.0	NS
P	*Isoetes acadiensis*	Acadian Quillwort				S3	3 Sensitive	4	29.5 ± 1.0	NS
P	*Lycopodium sitchense*	Sitka Clubmoss				S3	4 Secure	10	16.6 ± 2.0	NS
P	*Huperzia appalachiana*	Appalachian Fir-Clubmoss				S3	3 Sensitive	30	7.8 ± 5.0	NS
P	*Botrychium dissectum*	Cut-leaved Moonwort				S3	4 Secure	3	47.6 ± 5.0	NS
P	*Polypodium appalachianum*	Appalachian Polypody				S3	5 Undetermined	2	11.1 ± 0.0	NS
P	*Asclepias incarnata ssp. pulchra*	Swamp Milkweed				S3?	5 Undetermined	1	98.3 ± 0.0	NS
P	*Lycopodium sabinifolium*	Ground-Fir				S3?	4 Secure	5	50.9 ± 1.0	NS
P	*Atriplex franktonii*	Frankton's Saltbush				S3S4	4 Secure	5	75.8 ± 0.0	NS
P	*Suaeda calceoliformis*	Horned Sea-blite				S3S4	4 Secure	1	85.6 ± 1.0	NS
P	*Myriophyllum sibiricum*	Siberian Water Milfoil				S3S4	4 Secure	8	49.5 ± 0.0	NS
P	*Sanguinaria canadensis*	Bloodroot				S3S4	4 Secure	59	13.6 ± 0.0	NS
P	*Rumex maritimus*	Sea-Side Dock				S3S4		1	13.2 ± 0.0	NS
P	*Fragaria vesca ssp. americana*	Woodland Strawberry				S3S4	4 Secure	26	7.2 ± 4.0	NS
P	*Salix petiolaris*	Meadow Willow				S3S4	4 Secure	4	95.9 ± 0.0	NS
P	*Carex argyrantha*	Silvery-flowered Sedge				S3S4	4 Secure	2	92.7 ± 0.0	NS
P	*Eriophorum russeolum*	Russet Cottongrass				S3S4	4 Secure	1	50.9 ± 1.0	NS
P	*Juncus acuminatus*	Sharp-Fruit Rush				S3S4	4 Secure	2	13.2 ± 0.0	NS
P	*Luzula parviflora*	Small-flowered Woodrush				S3S4	4 Secure	88	0.5 ± 0.0	NS
P	*Liparis loeselii*	Loesel's Twayblade				S3S4	4 Secure	4	56.4 ± 1.0	NS
P	*Trisetum spicatum*	Narrow False Oats				S3S4	4 Secure	35	3.9 ± 5.0	NS
P	*Cystopteris bulbifera*	Bulblet Bladder Fern				S3S4	4 Secure	149	9.8 ± 0.0	NS
P	*Equisetum hyemale var. affine*	Common Scouring-rush				S3S4	4 Secure	24	8.3 ± 10.0	NS
P	*Equisetum scirpoides*	Dwarf Scouring-Rush				S3S4	4 Secure	11	9.5 ± 0.0	NS
P	*Lycopodium complanatum*	Northern Clubmoss				S3S4	4 Secure	4	11.5 ± 1.0	NS
P	*Schizaea pusilla*	Little Curlygrass Fern				S3S4	4 Secure	24	17.2 ± 0.0	NS
P	*Poa alpina*	Alpine Blue Grass				SH	0.1 Extirpated	2	67.5 ± 0.0	NS
P	*Botrychium minganense*	Mingan Moonwort				SH	0.1 Extirpated	1	73.9 ± 1.0	NS

5.1 SOURCE BIBLIOGRAPHY (100 km)

The recipient of these data shall acknowledge the ACCDC and the data sources listed below in any documents, reports, publications or presentations, in which this dataset makes a significant contribution.

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APPENDIX D

NOVA SCOTIA MUSEUM REPORT

HERITAGE AND BIOLOGICAL RESOURCES

NOVA SCOTIA

Communities, Culture & Heritage

1741 Brunswick Street
3rd Floor
P.O. Box 456
Halifax, NS
B3J 2R5

Tel: (902) 424-6475
Fax: (902) 424-0560

December 21, 2016

Heather A. Levy
Envirosphere Consultants Limited
PO 2906 Unit 5 - 120 Morison Dr.
Windsor, NS. B0N 2T0

Dear Ms. Levy:

RE: Environmental Screening 16-11-16a
Money Point Quarry Expansion

Further to your request of November 16, 2016 staff at Communities, Culture and Heritage has reviewed their files for reference to the presence of natural and heritage resources in the study area. Please be aware that the information is not comprehensive, and may include varying degrees of accuracy with respect to the precise location and condition of natural resources.

It should be noted that the amount and degree of disturbance from previous developments could have a significant role in establishing the presence, absence or condition of natural and heritage resources in this area.

Botany

Staff reviewed all records of the species-at-risk held at Nova Scotia Museum. The following vascular plant species are known from the geographic region containing the footprint, but not necessarily the habitat. They should be considered in a timely field assessment and their presence or absence recorded. The colour ranks have been assigned by Department of Natural Resources. The list is extensive owing to the extreme northeast location. The arctic-alpine floral element is remnant here, with many species not found further south.

Adiantum pedatum Red
Anemone canadensis Orange
A.riparia Yellow
Arabis drummondii Yellow
Arabis hirsute Orange
Artemisia campestris Orange
Betula pumila Yellow
Calamagrostis stricta Yellow
Carex adusta Yellow
Carex atratiformis Yellow
Carex castanea Orange
Carex eburnean Yellow

Carex scirpoides Yellow
Coeloglossum viride Orange
Crataegus flabellata Yellow
Cypripedium reginae Orange
Diapensia lapponica Orange
Draba arabisans Yellow
Draba glabella Orange
Draba norvegica Orange
Draba pycnosperma Orange
Empetrum easmesii Yellow
Epilobium hornemannii Yellow
Epilobium strictum Yellow
Galium labradoricum Yellow
Eriophorum gracile Yellow
Galium labradoricum Yellow
Gentianella amarelle Orange
Geocaulon lividum Yellow
Goodyera longifolia Yellow
Impatiens pallida Yellow
Juncus trifidus Yellow
Luzula spicata Orange
Pedicularis palustris Orange
Poa glauca, ssp. Glauca Yellow
Polystichum lonchitis Yellow
Saxifraga paniculata Yellow
Shepherdia Canadensis
Vaccinium boreale Orange
Vaccinium ovalifolium Orange
Vaccinium uliginosum Yellow
Veronica serpyllifolia Yellow
Woodsia glabella Yellow

Archaeology

Staff reviewed records and there are no recorded archaeological sites on file for the quarry area or larger vicinity. Historic maps do not indicate settlement directly at the quarry location but nearer the associated roadways. There are 2 water sources at the quarry site and Middle Brook is nearby. It may intersect with the larger study area. It is recommended that an assessment for archaeological resources is carried out for the project area.

If you have any questions, please contact me at 424-6475.

Sincerely,

Sean Weseloh-McKeane
Coordinator, Special Places

Enclosure

APPENDIX E

LABORATORY RESULTS

TSS & pH

Envirosphere Consultants Limited

Unit 5—120 Morison Drive, Box 2906, Windsor, Nova Scotia, B0N 2T0

ph: (902) 798-4022, fax: (902) 798-2614, e-mail: enviroco@ns.sympatico.ca, website: www.envirosphere.ca

Envirosphere Consultants Ltd.
PO Box 2906, Unit 5- 120 Morison Drive
Windsor, NS
B0N 2T0

Environmental Sample Analysis Report

Report Date: 30-Jun-17 Report Number: A0624

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	TSS (mg/L)	Type of Sample	Detection Limit	Sample Comments
L2017-35	WS6	Municipal Money Point Quarry	stream water	6/23/2017	6/29/2017	3.0	REG	0.5 mg/L	
L2017-35	WS7	Municipal Money Point Quarry	stream water	6/23/2017	6/29/2017	3.5	REG	0.5 mg/L	
L2017-35	WPT19	Municipal Money Point Quarry	stream water	6/23/2017	6/29/2017	11.0	REG	0.5 mg/L	
L2017-35	WS6 DUP	Municipal Money Point Quarry	stream water	6/23/2017	6/29/2017	1.0	DUP	0.5 mg/L	
L2017-35	Blank	Municipal Money Point Quarry	dH2O	6/23/2017	6/29/2017	<0.5	BLANK	0.5 mg/L	
L2017-35	CRM	Municipal Money Point Quarry	CRM	6/23/2017	6/29/2017	214.0	STD	0.5 mg/L	CRM =211 mg/L

Name of Analyst: Jay Baker Analyses reviewed by: Director / Lab Manager (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories".

Validation Range: 1-1000 mg/L The results in this report relate only to the items tested. More information is available upon request.

The quality of the results is dependent on the quality of sample provided.

Samples for TSS analysis should be kept cool until delivery to the lab unless they are analyzed immediately. A minimum sample volume of 500 ml is preferred. Place sample in a clean plastic container free of cracks or contamination. Fill the bottle to the top and then cap. Samples should reach the lab within 24 hours of sampling, but will be accepted up to 7 days.

Methods: Modified from Standard Methods for the Examination of Water and Wastewater 22nd Edition. 2012 and online version. 2540D. Total Suspended Solids. ECL method 3, Total Suspended Solids.

Type of Sample: REG = regular; STD = standard; DUP = duplicate; CRM = certified reference material.

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.

Envirosphere Consultants Limited

Unit 5—120 Morison Drive, Box 2906, Windsor, Nova Scotia, B0N 2T0

ph: (902) 798-4022, fax: (902) 798-2614, e-mail: enviroco@ns.sympatico.ca, website: www.envirosphere.ca

Envirosphere Consultants Ltd.
Unit 5 - 120 Morison Drive
Windsor, Nova Scotia
B0N 2T0

Environmental Sample Analysis Report

Report Date: 30-Jun-17 Report Number: A0625

Lab #	Sample ID	Sample Details	Sample Material	Date Received	Date Analyzed	pH	Type of Sample	Detection Limit	Sample Comments
L2017-35	CRM	Municipal Money Point Quarry	CRM		6/24/2017	7.0	STD	0.1	CRM pH 7.00 +- 0.01
L2017-35	WPT19	Municipal Money Point Quarry	stream water	6/23/2017	6/24/2017	7.4	REG	0.1	
L2017-35	WS6	Municipal Money Point Quarry	stream water	6/23/2017	6/24/2017	7.4	REG	0.1	
L2017-35	WS6 DUP	Municipal Money Point Quarry	stream water	6/23/2017	6/24/2017	7.4	DUP	0.1	
L2017-35	WS7	Municipal Money Point Quarry	stream water	6/23/2017	6/24/2017	7.3	REG	0.1	

Name of Analyst: Jay Baker Analyses reviewed by: [signature] Director / Lab Manager (circle one)

This laboratory applies standard practice in conformance with ISO/IEC 17025:2005, "General Requirements for the Competence of Testing and Calibration Laboratories".

Validation Range: 3-10 units The results in this report relate only to the items tested. More information is available upon request.

The quality of the results is dependent on the quality of sample provided.

Comment: Samples for pH should be kept cool until delivery to the lab unless the samples are analyzed immediately. Preferably samples should be analyzed within 24 hours. Hach manual recommends filling bottle completely and capping tightly; cooling to 4°C for storage and analyzing within 6 hours. If this can't be done, Hach manual recommends reporting the holding time with results.

Method: Standard Methods for the Examination of Water and Wastewater 22nd Edition. 2012 and online version., 4500-HB. Electrometric measurement of pH. ECL Method 8, pH.

Type of Sample: REG = regular; STD = standard; DUP = duplicate; CRM = certified reference material.

Sample Comments: BDL = Below Detection limit; QR = Qualified result; NR = No result, damaged or insufficient sample; MAC = Maximum Allowable Concentration.