

**Appendix D:  
Vegetation Technical Report**



**Technical Report on Vegetation at  
Sylvia Lake**

Final Report  
Stantec Consulting Ltd.  
October 2010

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## 1.0 Introduction

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Tim Horton Children's Foundation (THCF) is proposing to develop a youth leadership camp at Sylvia Lake (herein referred to as the "Project"), within the Whiteshell Provincial Park, across the Winnipeg River and due south (<1 km) of Pinawa, MB (Figure 1-1). The proposed camp will occur within a lease area of approximately 17.2 ha and consist of: a main lodge, bunkhouses, yurts, sports and recreational facilities, on-site services (e.g., septic treatment system and potable water treatment system), docks along the shoreline and an internal road network. Collateral developments proposed by Manitoba Conservation to service the site will include an entry road from Highway 307 (approximately 3.65 km in length), and a hydro servicing line within the entry road right of way and connecting to the existing distribution line located west of the Project area.

This technical report describes the ecological setting and plant communities at the camp and collateral developments and is intended to support the environmental assessment for the proposed camp development. The objectives of the plant surveys conducted at the site were to examine vegetation community types, to gather a list of plant species, to look for rare plants and to provide baseline data to assess impacts that project activities could have on the plant communities.



## 2.0 Study Area

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The Project is located on the shore of the Sylvia Lake portion of the Winnipeg River, inside Whiteshell Provincial Park. The Project site is located within the Boreal Shield ecozone, Lake of the Woods ecoregion, Pinawa ecodistrict. This ecodistrict is characterized by upland forests with balsam fir (*Abies balsamea*), trembling aspen (*Populus tremuloides*), black spruce (*Picea mariana*), white spruce (*Picea glauca*), jack pine (*Pinus banksiana*) dominated bedrock outcrops, black spruce peat lands, sedge fens with tamarack (*Larix laricina*), alder (*Ulnus spp.*) and birch (*Betula spp.*) shrubs and riparian areas dominated by deciduous trees such ash (*Fraxinus spp.*) and bur oak (*Quercus macrocarpa*) (Smith *et al.* 1998).

## **3.0 Methods**

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### **3.1 PRELIMINARY ASSESSMENT**

Prior to the field assessment, forest resource inventory (FRI) data were used to gain a basic understanding of community and vegetation types, which helped to determine appropriate sample sizes for the Project study.

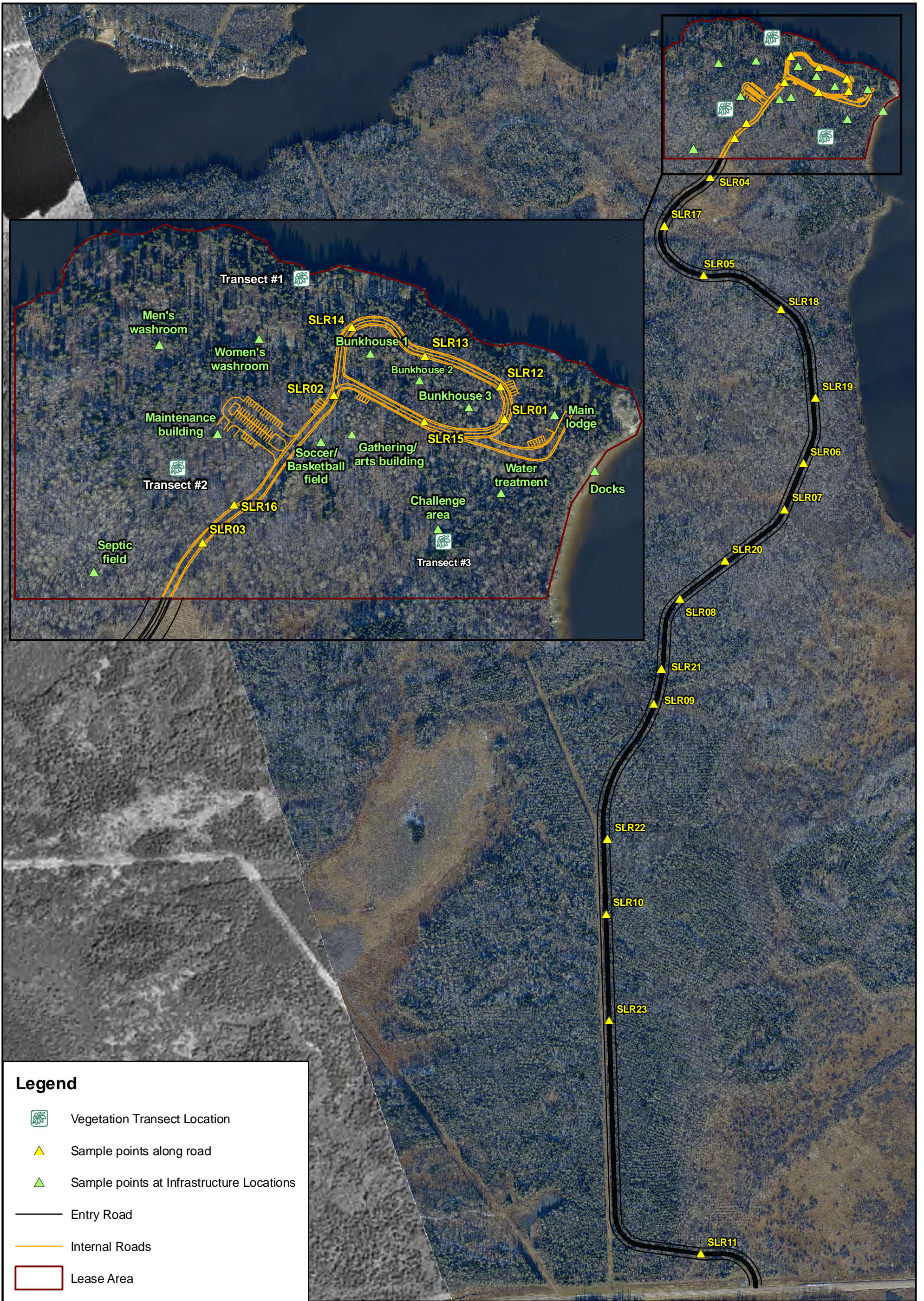
### **3.2 FIELD ASSESSMENT**

From August 18-19, 2010, surveys of the camp footprint were conducted, while a survey of the collateral development alignment was completed on September 23, 2010. Basic vegetation community descriptions were developed and plant species lists were compiled for every location of proposed infrastructure, outdoor use areas and on select points along the proposed collateral development alignment (Figure 3-1). Brief meander surveys were conducted at each site to look for rare plants (Landcaster 2000).







Comprehensive vegetation data were collected for three transects within the camp footprint. Transects were chosen to represent different community types, and where possible, located near areas proposed for development (Figure 3-1). In each of the three sample locations, 50-m transects were set up with a measuring tape. Vegetation composition and percent cover were sampled at every 10 m interval along the transects using nested quadrats. For ground cover less than 1 m in height, a 1 m x 1 m quadrat was used for sampling, while a 2.5 m x 2.5 m quadrat was used to sample all shrubs between 1 m and 2.5 m in height (Redburn and Strong 2008). Averages for percent cover of shrub and ground cover were calculated for the three transects.

The point quarter method (see Cottham and Curtis 1956) was used to sample trees. For this method, sample points were chosen along transects at every 10 m. Each sample point was divided into four quadrants and the closest tree to the point within each quadrant was sampled. The distance from each tree to the central point and the diameter at breast height were recorded. For each transect, statistics were calculated to determine tree densities, basal areas of trees (Cottham and Curtis 1956), average tree diameters and average distances to trees.



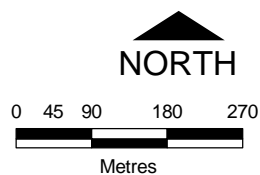
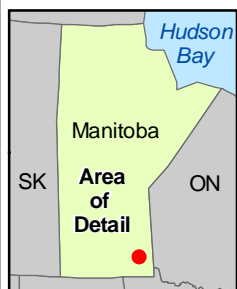


**Legend**

-  Vegetation Transect Location
-  Sample points along road
-  Sample points at Infrastructure Locations
-  Entry Road
-  Internal Roads
-  Lease Area



**Locations of Vegetation Transect and Survey Points**



*Acknowledgements:*  
 Data provided by ATLAS Geomatics (Imagery),  
 Stantec (Vegetation sample) and THCF  
 (project lease area and proposed road)  
 Projection: NAD83 Zone 14N

PREPARED BY



MAP SCALE 1:9,000		DATA SCALE NA	
DATE October 1, 2010		PROJECT 1114 57005	FIGURE NO. <b>3-1</b>
DRAWN KM	CHECKED DW	APPROVED DW	



## 4.0 Results

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### 4.1 OVERVIEW OF ECOLOGICAL COMMUNITIES

The Project site had several distinct ecological community types. Most of the camp footprint (i.e., lease area) was covered by mixedwood forests dominated by balsam fir, paper birch (*Betula papyrifera*) and trembling aspen. These mixedwood forests had a sparse shrub stratum and more leaf litter than herbs covering the ground (Photo 4-1). The project site also had hardwood stands that were characterized by trembling aspen mixed with other hardwoods. These stands had a shrub stratum of willow (*Salix spp.*) and beaked hazel (*Corylus cornuta*) and more ground covered by herbs/grasses as compared with leaf litter (Photo 4-2). Rocky outcrops with jack pine and paper birch were near the north shoreline (Photo 4-3).

The buffer around the proposed collateral development (i.e., entry road and hydroelectric distribution line) was mainly mixedwood forest stands with some areas of hardwood forest stands. The proposed collateral development traverses an area of open meadow with grasses and sedges (Photo 4-4) just south of the lease area boundary. There were also a number of swamps along the collateral development area, which were characterized by standing water, dead standing trees, some small trees and shrubs and a dominant ground cover of grasses and sedges (*Carex spp.*). Other trees present in the area were green ash (*Fraxinus pennsylvanica*), black ash (*Fraxinus nigra*), bur oak, American elm (*Ulmus americana*), balsam poplar (*Populus balsamifera*), white spruce and black spruce.

Common shrub species at the Project site were beaked hazel, willow, prickly rose (*Rosa acicularis*), bunchberry (*Cornus canadensis*), wild raspberry (*Rubus ideas*), poison ivy (*Toxicodendron rydbergii* (Small ex Rydbi) Green) and trailing raspberry (*Rubus pubescens*). It is important to note that poison ivy occurs at several of the outdoor use areas and buildings. Common herbs were wild strawberry (*Fragaria virginiana*), wild sarsaparilla (*Aralia nudicaulis*), asters (*Aster spp.*), palmate-leaved coltsfoot (*Petasites palmatus*) and bedstraw (*Galium spp.*).



Photo 4-1: Mixedwood forest stand



Photo 4-2: Hardwood-dominated stand





Photo 4-3: Rock outcrop with jack pine along north shoreline



Photo 4-4: Open meadow with grasses and sedges

## 4.2 OVERVIEW OF VEGETATION AND RARE PLANTS

In total, 80 species of vascular plants and six species of non-vascular ground covering plants were recorded within the Project site and collateral development footprints. Of the vascular plants, 12 species were trees, 21 species were shrubs, 40 species were herbs and seven species were graminoids (Appendix A). No rare plants were noted during surveys. However, survey timing in late August and September was later than some flowering periods, reducing the likelihood of detection for some species.

Occurrences of several rare plants have been documented in areas near the project site (Table 4-1). As the project site had similar ecological communities to surrounding areas, the site may provide suitable habitat for rare plant species. A list of rare plants which may occur at the Project site due to their distribution is included in Appendix B. However, no rare or endangered species listed by MESA, SARA or COSEWIC were found at the site.

Table 4-1: Rare Plant Occurrences near Project Site		
Common name	Scientific name	Manitoba Status Rank
Dog violet	<i>Viola conspersa</i>	Uncommon (S3?)
Hop hornbeam	<i>Ostrya virginiana</i>	Rare (S2)
Emory's sedge	<i>Carex emoryi</i>	Rare (S2?)
Narrow-leaved gerardia	<i>Agalinis tenuifolia</i>	Rare or Uncommon (S2S3)
Source: Manitoba Conservation Data Centre (2010)		
? denotes uncertainty in provincial S-rank		

## 4.3 SITE DESCRIPTIONS

The following are general descriptions of areas that are proposed to be directly impacted by project activities. Species lists for individual sites are in Appendix C.

*Main lodge* – Paper birch stand (20-25 m in height) with some balsam fir, American elm and green ash. The shrub stratum was dominated by young ash trees. Herb cover was sparse, but had abundant strawberries and frequent bunchberry. Poison ivy was present at site.

*Potable water treatment building* – Paper birch (17-22 m height) stand with white spruce, trembling aspen and green ash. Shrub stratum was very sparse. Ground cover was dominated by leaf litter, with some low shrubs and herbs. Poison ivy was present at site.

*Outdoor challenge area* – Fairly open area with an even mix of coniferous and deciduous tree species. Tree species include balsam poplar (15 m height), trembling aspen, green ash, white spruce and balsam fir at the periphery. Site was very wet and showed signs of previous disturbance (flooding, wind or fire). Shrub stratum had areas with thick wild raspberry and herb layer had abundant fireweed (*Epilobium angustifolium*). Poison ivy was present at site.



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*Bunkhouse 1* – Evenly mixed stand of paper birch (12-17 m tall) and balsam fir (10-15 m tall). Shrub stratum for half the site had thick beaked hazel and whole site had small trembling aspen. Ground cover was sparse with abundant leaf litter and was dominated by trailing raspberry and prickly rose.

*Bunkhouse 2* – An even mixed stand of paper birch (17-22 m tall) and balsam fir with some American elm. Shrub stratum mainly comprised of beaked hazel (approximately 6 feet tall). Ground was covered with a lot of litter and deadfall, possibly from a recent storm event. Herb cover was sparse.

*Bunkhouse 3* – Balsam fir stand with some paper birch, American elm and green ash. Tree heights ranged from 10-25 m in height. The ground cover was dominated by leaf litter with very sparse herb cover.

*Gathering hall* – Evenly mixed stand of paper birch (15-20 m tall) and trembling aspen (15-20 m tall) with some green ash. Shrub stratum was dominated by chokecherry (*Prunus virginiana*), but also had beaked hazel and young green ash. The understory had an abundant amount of bunchberry and wild raspberry. Poison ivy was present at site.

*Soccer field* – East part of site was mixed balsam fir/paper birch stand with sparse understory dominated by leaf litter. West part of site was a trembling aspen stand with a grassy understory and some areas of dense green alder (*Alnus crispa*). Poison ivy was present at site.

*Female washroom* – Rock outcrop dominated by paper birch and bur oak with some white spruce and trembling aspen. Site was adjacent to a small wetland with sedges and willow. Understory was dominated by dwarf blueberries (*Vaccinium caespitosum*) and had an abundant amount of goldenrod (*Solidago spp.*).

*Male washroom* – Paper birch and balsam poplar stand (15-20 m tall) with some white spruce. Shrub stratum was mainly composed of beaked hazel, wild saskatoon and wild raspberry. Herb layer was fairly rich with wild strawberry, goldenrod and feather mosses.

*Maintenance building and staff residence* – Paper birch (15-20 m tall) stand with some green ash, trembling aspen, balsam fir and white spruce. Shrub stratum had small green ash, willow, beaked hazel and red-osier dogwood (*Cornus stolonifera*). Ground cover dominated by grasses. Poison ivy was present at site.

*Septic field* – Trembling aspen stand (20-25 m tall) with some white spruce. Shrub stratum had small ash, hazel, saskatoon and wild raspberry.

*Docks along east shoreline* – Riparian area dominated by green ash. Lead up to docks had small wetland with grasses and sedges.

*Collateral development alignment* – Traverses a variety of different ecological communities. Much of the alignment was through mixedwood and deciduous forest stands. The alignment

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crosses an area of open bedrock along the most northern section of the alignment, which parallels the northern shoreline. Just south of the lease area, the alignment passes through an open grassy meadow. Both inside the leased area and outside, the alignment traverses several treed and non-treed swamps which had standing water and were dominated by grasses and sedges. Descriptions of individual stops along the alignment (Figure 3-1) are presented in Table 4-2.

<b>Table 4-2: Ecological Description of Internal Road Network and Collateral Development Footprints</b>		
<b>Sample Point</b>	<b>Location description</b>	<b>Ecological description</b>
SLR-01	Eastern portion of internal road loop	Trembling aspen/paper birch dominant stand with some balsam fir, green ash and American elm. Sparse shrub and herb layers with leaf litter dominating ground cover.
SLR-12	Northern portion of internal road loop	Area of bedrock covered in some feather mosses, wild raspberry and wild strawberry. Stand was surrounded by a mixedwood stand of American elm, paper birch, balsam fir and trembling aspen.
SLR-13	Northern portion of internal road loop	A mature balsam fir stand with several large trembling aspen, beaked hazel in the shrub strata and sparse ground cover dominated by leaf litter.
SLR-14	Western portion of internal road loop	A small wetland that was approximately 15 m x 10 m and had standing water, grasses and willow.
SLR-15	Southern portion of internal road loop	Open canopied mature paper birch (15-20 m tall), trembling aspen (>25 m tall) and balsam fir stand. Sparse understory had some wild raspberry, beaked hazel and downy arrowwood ( <i>Viburnum rafinesquianum</i> ). Ground cover dominated by leaf litter with some wild strawberries and bunchberries.
SLR-02	Directly south of internal road loop	A mature paper birch/trembling aspen stand with sparse shrub cover and leaf litter as dominant ground cover.
SLR-16	Internal road	A wet, treed swamp with paper birch, trembling aspen, small green ash and balsam poplar. Shrub strata dominated by wild raspberry, with reed grass ( <i>Calamagrostis spp.</i> ) as the most abundant ground cover.
SLR-03	Internal road	Seral trembling aspen stand with sparse understory and dominant leaf litter ground cover.
SLR-04	Collateral development alignment	A 150 m section (approx.) of the alignment just south of the lease area passed through an open meadow which was dominated by reed grass, had very little tree cover and sparse shrub cover. The meadow had some willows at the periphery of the site and some small patches of trembling aspen.



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<b>Table 4-2: Ecological Description of Internal Road Network and Collateral Development Footprints</b>		
<b>Sample Point</b>	<b>Location description</b>	<b>Ecological description</b>
SLR-17	Collateral development alignment	Open canopied mature paper birch stand. Shrub stratum had patches of beaked hazel and wild raspberry. Leaf litter was the dominant ground cover.
SLR-05	Collateral development alignment	Trembling aspen stand with an understory of small green ash, wild saskatoon, beaked hazel and wild raspberry. Ground cover was dominated by several species of graminoids.
SLR-18	Collateral development alignment	Open canopied paper birch stand with some balsam fir, trembling aspen, American elm and bur oak. Shrub stratum was sparse with some beaked hazel and wild saskatoon. Ground cover was mostly leaf litter.
SLR-19	Collateral development alignment	Trembling aspen/balsam fir stand with understory of green ash, downy arrow-wood, wild saskatoon and beaked hazel. Ground cover was dominated by leaf litter.
SLR-06	Collateral development alignment	Very wet area dominated by dead standing trembling aspen and some live trembling aspen. Sparse understory of beaked hazel, wild saskatoon, prickly rose and wild raspberry. Ground cover was mainly leaf litter, but had an abundance of grasses.
SLR-07	Collateral development alignment	Sedge dominated swamp with dead standing trees (mostly trembling aspen). Sparse shrub stratum had some willows and wild raspberry.
SLR-20	Collateral development alignment	Mature trembling aspen stand with trees that were 20-25 m tall. Sparse shrub stratum had willows and wild raspberry. Grasses dominated ground cover.
SLR-08	Collateral development alignment	Balsam fir/mature trembling aspen stand with sparse shrub stratum of small green ash, beaked hazel, wild raspberry and downy arrow-wood. Ground was covered mainly by leaf litter.
SLR-21	Collateral development alignment	Mixed-age trembling aspen stand with wild raspberry and beaked hazel shrub stratum. Leaf-litter dominated the ground cover.
SLR-09	Collateral development alignment	Swamp with open water and dead standing trees (mainly American elm). Sparse shrub stratum of green alder and wild raspberry. Ground covered mainly by graminoids.
SLR-22	Collateral development alignment	Closed canopied balsam fir/paper birch stand with sparse shrub stratum of beaked hazel. Leaf litter dominant with an abundance of moss covering the ground.
SLR-10	Collateral development alignment	Open paper birch/balsam fir stand with some mature trembling aspen. Sparse shrub stratum with leaf litter

<b>Table 4-2: Ecological Description of Internal Road Network and Collateral Development Footprints</b>		
<b>Sample Point</b>	<b>Location description</b>	<b>Ecological description</b>
		dominating ground cover.
SLR-23	Collateral development alignment	Trembling aspen/balsam fir stand with sparse understory of downy arrow-wood. Dominant ground cover was leaf litter.
SLR-11	Collateral development alignment	Trembling aspen swamp with many dead standing trees, some live green ash and American elm. Sparse shrub layer had meadowsweet ( <i>Spirea alba</i> ), beaked hazel and wild raspberry. Reed grass and sedges were the main grass cover.

#### **4.4 VEGETATION TRANSECTS**

Transect 1 was situated in a balsam fir and paper birch stand with an open canopy and low tree density (Table 4-3). This site was approximately 20 m from the shoreline (Figure 3-1). Both shrub strata and herb layer were sparse and ground cover was dominated by leaf litter, feather moss and rock. The most common shrubs were beaked hazel and common juniper, while the herbs with the greatest cover were trailing raspberry and bunchberry (Appendix D).

Transect 2 was situated in a mature, closed canopied, trembling aspen stand with occasional balsam fir. The tree density was moderate (Table 4-1) and trees were 20-25 m tall. The site was close to the location of the proposed septic field. Shrub stratum was primarily wild raspberry and small green ash. Ground cover was dominated by litter and grass.

Transect 3 was situated in a mature Balsam Fir mixedwood stand with a closed canopy and with trees that were 20-25 m tall. Site was close to the proposed outdoor challenge area. Stand had relatively high tree density (Table 4-2). Shrub stratum was very sparse with some small green ash. Ground cover was dominated by litter and moss, with an abundance of scouring rushes (*Equisetum arvense*).

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Table 4-3: Results for Point Quarter Method Data						
Transect Number	Tree Species Along Transect	Relative Density of Tree Species	Average Distance from Centre Point (m)	Average Tree Diameter (cm)	Total Density (trees per ha)	Total Basal Area (m per ha)
1	<i>Abies balsamea</i>	0.55	4.5	13	484	8.7
	<i>Betula papyrifera</i>	0.45				
2	<i>Populus tremuloides</i>	0.85	2.2	12	2010	26.02
	<i>Abies balsamea</i>	0.15				
3	<i>Populus tremuloides</i>	0.1	1.4	12	5363	83.9
	<i>Abies balsamea</i>	0.35				
	<i>Fraxinus pennsylvanica</i>	0.5				
	<i>Betula papyrifera</i>	0.05				



## 5.0 Key Observations

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Based on the field and desktop assessments conducted and site evaluation, the key observations are as follows:

- The plant communities found within the proposed project site are common within the Pinawa ecodistrict. Overall the communities in the camp lease area and along the collateral development alignment are diverse, heterogeneous and have representative stands of different succession stages. There are various community types in a small area, while plant species and tree density differs throughout the site.
- No rare plants were found at the site during field visits in August and September, but the ecological communities may be able to support rare plants. More comprehensive rare plant surveys earlier in the flowering season could provide more definitive information on rare plant occurrences in the area.
- Some small wetlands, swamps and very wet areas dominated by grasses and sedges occur within the camp footprint and along the collateral development alignment. Several of these wetland communities, which may be important as wildlife habitat, will be lost due to entry road construction.
- Poison ivy was present throughout the site, which will have to be considered during project operation.

## 6.0 Closure

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This report was prepared for the sole benefit of Tim Horton Children's Foundation. The report may not be relied upon by any other person or entity without the express written consent of Stantec Consulting Ltd. and Tim Horton Children's Foundation.

Any use which a third party makes of this report, or any reliance on decisions made based on it, is the responsibility of such third parties. Stantec Consulting Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted scientific practices current at the time the work was performed. The conclusions and recommendations presented represent the best judgment of Stantec Consulting Ltd. based on the data obtained from the work and on the site conditions encountered at the time the work was performed at the specific sampling, testing, and/or observation locations.

This report was prepared by Kristin Mozel and was reviewed by Sandy Gorrie.

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**Appendix A:  
Plants Recorded at Project Site**

Appendix A - Plants Recorded at Project Site	
Common Name	Scientific Name
<b>Vascular Plants</b>	
<b>Trees</b>	
balsam fir	<i>Abies balsamea</i>
paper birch	<i>Betula papyrifera</i>
black ash	<i>Fraxinus nigra</i>
green ash	<i>Fraxinus pennsylvanica</i>
white spruce	<i>Picea glauca</i>
black spruce	<i>Picea mariana</i>
jack pine	<i>Pinus banksiana</i>
balsam poplar	<i>Populus balsamifera</i>
trembling aspen	<i>Populus tremuloides</i>
chokecherry	<i>Prunus virginiana</i>
bur oak	<i>Quercus macrocarpa</i>
American elm	<i>Ulmus americana</i>
<b>Shrubs</b>	
green alder	<i>Alnus crispa</i>
saskatoon	<i>Amelanchier alnifolia</i>
bunchberry	<i>Cornus canadensis</i>
red-osier dogwood	<i>Cornus stolonifera</i>
beaked hazel	<i>Corylus cornuta</i>
hawthorne	<i>Crataegus chrysocarpa</i>
bush honeysuckle	<i>Diervilla lonicera</i>
common juniper	<i>Juniperus communis</i>
honeysuckle	<i>Lonicera spp.</i>
currant	<i>Ribes spp.</i>
prickly rose	<i>Rosa acicularis</i>
smooth rose	<i>Rosa blanda</i>
wild raspberry	<i>Rubus idaeus</i>
trailing raspberry	<i>Rubus pubescens</i>
willow	<i>Salix spp.</i>
meadowsweet	<i>Spiraea alba</i>
snowberry	<i>Symphoricarpos albus</i>
poison ivy	<i>Toxicodendron rydbergii</i>
dwarf blueberry	<i>Vaccinium caespitosum</i>
low-bush cranberry	<i>Viburnum edule</i>
downy arrow-wood	<i>Viburnum rafinesquianum</i>
<b>Herbs</b>	
yarrow	<i>Achillea millefolium</i>
pearly everlasting	<i>Anaphalis margaritacea</i>
anemone	<i>Anemone spp.</i>
columbine	<i>Aquilegia canadensis</i>
wild sarsparilla	<i>Aralia nudicaulis</i>
aster	<i>Aster spp.</i>
common harebell	<i>Campanula rotundifolia</i>
thistle	<i>Cirsium arvense</i>
bindweed	<i>Convolvulus spp.</i>
striped coralroot	<i>Corallorhiza striata</i>
corydalis	<i>Corydalis sempervirens</i>

<b>Appendix A - Plants Recorded at Project Site</b>	
<b>Common Name</b>	<b>Scientific Name</b>
hawksbeard	<i>Crepis spp.</i>
wood fern	<i>Dryopteris austriaca</i>
fireweed	<i>Epilobium angustifolium</i>
scouring rush	<i>Equisetum arvense</i>
wild strawberry	<i>Fragaria virginiana</i>
northern bedstraw	<i>Galium boreale</i>
sweet-scented bedstraw	<i>Galium triflorum</i>
large leaved avens	<i>Geum macrophyllum</i>
narrowleaved hawkweed	<i>Hieracium umbellatum</i>
spotted touch-me-not	<i>Impatiens capensis</i>
mint	<i>Mentha spp.</i>
wild peavine	<i>Lathyrus spp.</i>
false lily-of-the-valley	<i>Maianthemum canadense</i>
bishop's cap	<i>Mitella nuda</i>
palmate-leaved coltsfoot	<i>Petasites palmatus</i>
arrowhead sweet coltsfoot	<i>Petasites sagittatus</i>
potentilla	<i>Potentilla spp.</i>
bracken fern	<i>Pteridium aquilinum</i>
wintergreen	<i>Pyrola spp.</i>
black snake-root	<i>Sanicula marilandica</i>
false Solomon's seal	<i>Smilacina stellata</i>
goldenrod	<i>Solidago spp.</i>
dandelion	<i>Taraxacum officinale</i>
meadow rue	<i>Thalictrum spp.</i>
starflower	<i>Trientalis borealis</i>
red clover	<i>Trifolium pratense</i>
milk vetch	<i>Vicia spp.</i>
violet	<i>Viola spp.</i>
Canadian white violet	<i>Viola canadensis</i>
<b>Graminoids</b>	
reed grass	<i>Calamagrostis spp.</i>
sedges	<i>Carex spp.</i>
drooping woodreed	<i>Cinna latifolia</i>
grasses	
rice grass	<i>Oryzopsis asperifolia</i>
common reed	<i>Phragmites australis</i>
bluegrass	<i>Poa spp.</i>
<b>Non-vascular Ground Cover</b>	
pixie cup	<i>Cladina spp.</i>
reindeer lichen	<i>Cladonia spp.</i>
Crustose lichen	<i>Crustose lichen spp.</i>
stair-step moss	<i>Hylecomium splendens</i>
Liverwort	
red-stemmed feather moss	<i>Pleurozium schreberi</i>



**Appendix B:  
Listed Species in Manitoba**

**Appendix B - Listed Species in Manitoba**

<b>Common Name</b>	<b>Scientific Name</b>	<b>SARA Status</b>	<b>Schedule</b>	<b>COSEWIC Status</b>	<b>MESA</b>
Rough Agalinis	<i>Agalinis aspera</i>	Endangered	Schedule 1	Endangered	NA
Buffalograss	<i>Buchloë dactyloides</i>	Threatened	Schedule 1	Threatened	Threatened
Hackberry	<i>Celtis occidentalis</i>	NA	NA	NA	Threatened
Smooth Goosefoot	<i>Chenopodium subglabrum</i>	Threatened	Schedule 1	Threatened	NA
Small White Lady's-slipper	<i>Cypripedium candidum</i>	Endangered	Schedule 1	Endangered	Endangered
Hairy Prairie-clover	<i>Dalea villosa var. villosa</i>	Threatened	Schedule 1	Threatened	Threatened
Western Prairie Fringed-orchid	<i>Platanthera praeclara</i>	Endangered	Schedule 1	Endangered	Endangered
Riddell's Goldenrod	<i>Solidago riddellii</i>	Special Concern	Schedule 1	Special Concern	Threatened
Great Plains Ladies'-Tresses	<i>Spiranthes magnicamporum</i>	NA	NA	NA	Endangered
Western Silvery Aster	<i>Symphyotrichum sericeum</i>	Threatened	Schedule 1	Threatened	Threatened
Western Spiderwort	<i>Tradescantia occidentalis</i>	Threatened	Schedule 1	Threatened	Threatened
Culver's-root	<i>Veronicastrum virginicum</i>	NA	NA	NA	Threatened

**Appendix C:  
Plant Species Lists for Sites**

**Appendix C - Plant Species Lists for Sites**

<b>Main Lodge</b>			
<b>Location</b>	<b>Common name</b>	<b>Scientific Name</b>	<b>Predominance*</b>
<b>Canopy</b>	white birch	<i>Betula papyrifera</i>	Dominant
	balsam fir	<i>Abies balsamea</i>	Some
	American elm	<i>Ulmus americana</i>	Some
	green ash	<i>Fraxinus pennsylvanica</i>	Some
<b>Shrub strata</b>	white birch	<i>Betula papyrifera</i>	Occasional
	snowberry	<i>Symphoricarpos albus</i>	Occasional
	prickly rose	<i>Rosa acicularis</i>	Occasional
	smooth rose	<i>Rosa blanda</i>	Occasional
<b>Understory</b>	green ash	<i>Fraxinus pennsylvanica</i>	Abundant
	bunchberry	<i>Cornus canadensis</i>	Frequent
	wild strawberry	<i>Fragaria virginiana</i>	Abundant
	rose (non-prickly)	<i>Rosa spp.</i>	Occasional
	bur oak	<i>Quercus macrocarpa</i>	Occasional
	trailing raspberry	<i>Rubus pubescens</i>	Occasional
	black snake-root	<i>Sanicula marilandica</i>	Occasional
	aster	<i>Aster spp.</i>	Rare
	northern bedstraw	<i>Galium boreale</i>	Occasional
	poison ivy	<i>Toxicodendron rydbergii</i>	Rare
	false lily-of-the-valley	<i>Maianthemum canadense</i>	Occasional
	meadow rue	<i>Thalictrum spp.</i>	Occasional

<b>Water Treatment Structure</b>			
<b>Location</b>	<b>Common name</b>	<b>Scientific Name</b>	<b>Predominance</b>
<b>Canopy</b>	white birch	<i>Betula papyrifera</i>	Predominant
	white spruce	<i>Picea glauca</i>	Some
	trembling aspen	<i>Populus tremuloides</i>	Some
	green ash	<i>Fraxinus pennsylvanica</i>	Some
<b>Shrub strata</b>	prickly rose	<i>Rosa acicularis</i>	Occasional
	snowberry	<i>Symphoricarpos albus</i>	Occasional
<b>Understory</b>	bunchberry	<i>Cornus canadensis</i>	Frequent
	coltsfoot	<i>Petasites palmatus</i>	Occasional
	bush honeysuckle	<i>Diervilla lonicera</i>	Occasional
	prickly rose	<i>Rosa acicularis</i>	Occasional
	violet	<i>Viola spp.</i>	Rare
	green ash	<i>Fraxinus pennsylvanica</i>	Occasional
	poison ivy	<i>Toxicodendron rydbergii</i>	Occasional
	aster	<i>Aster spp.</i>	Rare
	northern bedstraw	<i>Galium boreale</i>	Occasional
	sweet-scented bedstraw	<i>Galium triflorum</i>	Occasional
	trailing raspberry	<i>Rubus pubescens</i>	Occasional
mint	<i>Mentha spp.</i>	Rare	
<b>*Leaf Litter dominant</b>			

<b>Outdoor Challenge Area</b>			
<b>Location</b>	<b>Common name</b>	<b>Scientific Name</b>	<b>Predominance</b>
<b>Canopy</b>	balsam poplar	<i>Populus balsamifera</i>	Even mix
	trembling aspen	<i>Populus tremuloides</i>	Even mix
	green ash	<i>Fraxinus pennsylvanica</i>	Even mix



Appendix C - Plant Species Lists for Sites			
	white spruce	<i>Picea glauca</i>	Even mix
<b>Shrub strata</b>	wild raspberry	<i>Rubus idaeus</i>	Abundant
<b>Understory</b>	green ash	<i>Fraxinus pennsylvanica</i>	Occasional
	poison ivy	<i>Toxicodendron rydbergii</i>	Rare
	common reed grass	<i>Phragmites australis</i>	Occasional
	wild raspberry	<i>Rubus idaeus</i>	Abundant
	fireweed	<i>Epilobium angustifolium</i>	Abundant
	goldenrod	<i>Solidago spp.</i>	Occasional
	prickly rose	<i>Rosa acicularis</i>	Occasional
	aster	<i>Aster spp.</i>	Occasional
	wild sarsaparilla	<i>Aralia nudicaulis</i>	Occasional
thistle	<i>Cirsium arvense</i>	Occasional	

Bunkhouse No. 3			
Location	Common name	Scientific Name	Predominance
<b>Canopy</b>	balsam fir	<i>Abies balsamea</i>	Predominant
	white birch	<i>Betula papyrifera</i>	Some
	trembling aspen	<i>Populus tremuloides</i>	Some
	black spruce	<i>Picea mariana</i>	Some
<b>Shrub strata</b>	green alder	<i>Alnus crispa</i>	Occasional
<b>Understory</b>	trailing raspberry	<i>Rubus pubescens</i>	Occasional
	bunchberry	<i>Cornus canadensis</i>	Occasional
	trembling aspen	<i>Populus tremuloides</i>	Occasional
	balsam fir	<i>Abies balsamea</i>	Occasional
	green ash	<i>Fraxinus pennsylvanica</i>	Occasional
	wintergreen	<i>Pyrola spp.</i>	Occasional
	false Solomon's seal	<i>Smilacina stellata</i>	Rare
	aster	<i>Aster spp.</i>	Occasional
	balsam poplar	<i>Populus balsamifera</i>	Occasional
	currant	<i>Ribes spp.</i>	Occasional
black snake-root	<i>Sanicula marilandica</i>	Occasional	

Bunkhouse No. 2			
Location	Common Name	Scientific Name	Predominance
<b>Canopy</b>	white birch	<i>Betula papyrifera</i>	Even mix
	balsam fir	<i>Abies balsamea</i>	Even mix
	american elm	<i>Ulmus americana</i>	One occurrence
<b>Shrub strata</b>	beaked hazel	<i>Corylus cornuta</i>	Frequent
<b>Understory</b>	coltsfoot	<i>Petasites palmatus</i>	Occasional
	black snake-root	<i>Sanicula marilandica</i>	Occasional
	fern	<i>Pteridium spp.</i>	Occasional
	trailing raspberry	<i>Rubus pubescens</i>	Occasional
	starflower	<i>Trientalis borealis</i>	Occasional
	false Solomon's seal	<i>Smilacina stellata</i>	Occasional
	bunchberry	<i>Cornus canadensis</i>	Occasional
	aster	<i>Aster spp.</i>	Occasional
	sweet-scented bedstraw	<i>Galium triflorum</i>	Occasional
	sweet peavine	<i>Lathyrus spp.</i>	Rare
	bush honeysuckle	<i>Diervilla lonicera</i>	Occasional
	currant	<i>Ribes spp.</i>	Occasional

Appendix C - Plant Species Lists for Sites			
	false lily-of-the-valley	<i>Maianthemum canadense</i>	Rare
	green ash	<i>Fraxinus pennsylvanica</i>	Occasional
*Lots of leaf litter and deadfall. Evidence of a recent blow down			

Bunkhouse No. 1			
Location	Common name	Scientific Name	Predominance
Canopy	white birch	<i>Betula papyrifera</i>	Even mix
	balsam fir	<i>Abies balsamea</i>	Even mix
Shrub strata	green alder	<i>Alnus crispa</i>	Abundant
	trembling aspen	<i>Populus tremuloides</i>	Occasional
Understory	low-bush cranberry	<i>Viburnum edule</i>	Occasional
	bunchberry	<i>Cornus canadensis</i>	Occasional
	trailing raspberry	<i>Rubus pubescens</i>	Frequent
	prickly rose	<i>Rosa acicularis</i>	Frequent
	wild strawberry	<i>Fragaria virginiana</i>	Occasional
	wintergreen	<i>Pyrola spp.</i>	Occasional
	wild sarsaparilla	<i>Aralia nudicaulis</i>	Occasional
	sweet peavine	<i>Lathyrus spp.</i>	Occasional
	sweet-scented bedstraw	<i>Galium triflorum</i>	Occasional
	young bur oak	<i>Quercus macrocarpa</i>	Occasional
	currant	<i>Ribes spp.</i>	Occasional
	starflower	<i>Trientalis borealis</i>	Occasional
	bush honeysuckle	<i>Diervilla lonicera</i>	Occasional

Gathering Arts Area			
Location	Common name	Scientific Name	Predominance
Canopy	white birch	<i>Betula papyrifera</i>	Even mix
	trembling aspen	<i>Populus tremuloides</i>	Even mix
	green ash	<i>Fraxinus pennsylvanica</i>	Some
Shrub strata	green ash	<i>Fraxinus pennsylvanica</i>	Occasional
	chokecherry	<i>Prunus virginiana</i>	Frequent
	hawthorne	<i>Crataegus chrysoarpa</i>	Occasional
	beaked hazel	<i>Corylus cornuta</i>	Occasional
	wild raspberry	<i>Rubus idaeus</i>	Frequent
	snowberry	<i>Symphoricarpos albus</i>	Occasional
	green alder	<i>Alnus crispa</i>	Occasional
Understory	bunchberry	<i>Cornus canadensis</i>	Frequent
	non-prickly rose	<i>Rosa spp.</i>	Occasional
	black snake-root	<i>Sanicula marilandica</i>	Rare
	aster	<i>Aster spp.</i>	Occasional
	false Solomon's seal	<i>Smilacina stellata</i>	Occasional
	false lily-of-the-valley	<i>Maianthemum canadense</i>	Occasional
	low-bush cranberry	<i>Viburnum edule</i>	Occasional
	bur oak	<i>Quercus macrocarpa</i>	Occasional
	northern bedstraw	<i>Galium boreale</i>	Occasional
	poison ivy	<i>Toxicodendron rydbergii</i>	Occasional
	coltsfoot	<i>Petasites palmatus</i>	Occasional
	potentilla	<i>Potentilla spp.</i>	Rare
	wild peavine	<i>Lathyrus spp.</i>	Occasional
	wintergreen	<i>Pyrola spp.</i>	Occasional

Appendix C - Plant Species Lists for Sites			
	sweet-scented bedstraw	<i>Galium triflorum</i>	Occasional
*wood frog occurrence			

Soccer Field			
Location	Common name	Scientific Name	Predominance
Canopy	balsam fir	<i>Abies balsamea</i>	Even mix
	white birch	<i>Betula papyrifera</i>	Even mix
	trembling aspen	<i>Populus tremuloides</i>	Some
Shrub strata	green alder	<i>Alnus crispa</i>	Frequent
	bur oak	<i>Quercus macrocarpa</i>	Rare
	snowberry	<i>Symphoricarpos albus</i>	Occasional
	prickly rose	<i>Rosa acicularis</i>	Occasional
	red-osier dogwood	<i>Cornus stolonifera</i>	Occasional
Understory	wild strawberry	<i>Fragaria virginiana</i>	Occasional
	yarrow	<i>Achillea millefolium</i>	Occasional
	goldenrod	<i>Solidago spp.</i>	Occasional
	wild sarsaparilla	<i>Aralia nudicaulis</i>	Occasional
	wild raspberry	<i>Rubus idaeus</i>	Occasional
	common harebell	<i>Campanula rotundifolia</i>	Occasional
	dwarf blueberry	<i>Vaccinium caespitosum</i>	Occasional
	pearly everlasting	<i>Anaphalis margaritacea</i>	Occasional
	fern	<i>Pteridium spp.</i>	Occasional
	aster	<i>Aster spp.</i>	Occasional
	clover	<i>Trifolium spp.</i>	Occasional
	poison ivy	<i>Toxicodendron rydbergii</i>	Occasional
	black snake-root	<i>Sanicula marilandica</i>	Occasional
	bush honeysuckle	<i>Diervilla lonicera</i>	Occasional
	wild sarsaparilla	<i>Aralia nudicaulis</i>	Occasional
	green alder	<i>Alnus crispa</i>	Occasional
	false lily-of-the-valley	<i>Maianthemum canadense</i>	Occasional
	bunchberry	<i>Cornus canadensis</i>	Occasional
	anemone	<i>Anemone spp.</i>	Occasional
	coltsfoot	<i>Petasites palmatus</i>	Occasional
	snowberry	<i>Symphoricarpos albus</i>	Occasional
	bur oak	<i>Quercus macrocarpa</i>	Rare
	low-bush cranberry	<i>Viburnum edule</i>	Occasional

Shore Description			
Location	Common name	Scientific Name	Predominance
Canopy	balsam fir	<i>Abies balsamea</i>	N/A
	jack pine	<i>Pinus banksiana</i>	N/A
Shrub strata	common juniper	<i>Juniperus communis</i>	N/A
	wild raspberry	<i>Rubus idaeus</i>	N/A
Understory	meadowsweet	<i>Spirea alba</i>	N/A
	dwarf blueberry	<i>Vaccinium caespitosum</i>	N/A
	common harebell	<i>Campanula rotundifolia</i>	N/A
	goldenrod	<i>Solidago spp.</i>	N/A
	hawksbeard	<i>Crepis spp.</i>	N/A
	feather moss	<i>Pleurozium schreberi</i>	N/A
	reindeer lichen	<i>Cladina spp</i>	N/A

### Appendix C - Plant Species Lists for Sites

	pink corydalis	<i>Corydalis sempervirens</i>	N/A
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#### Women's Washroom

Location	Common name	Scientific Name	Predominance
Canopy	white birch	<i>Betula papyrifera</i>	Dominant
	bur oak	<i>Quercus macrocarpa</i>	Rare
	white spruce	<i>Picea glauca</i>	Some
Shrub strata	willow	<i>Salix spp.</i>	Occasional
	wild raspberry	<i>Rubus idaeus</i>	Occasional
	trembling aspen	<i>Populus tremuloides</i>	Some
Understory	dwarf blueberry	<i>Vaccinium caespitosum</i>	Abundant
	currant	<i>Ribes spp.</i>	Occasional
	aster	<i>Aster spp.</i>	Occasional
	prickly rose	<i>Rosa acicularis</i>	Occasional
	clover	<i>Trifolium spp.</i>	Occasional
	wild strawberry	<i>Fragaria virginiana</i>	Occasional
	violet	<i>Viola spp.</i>	Occasional
	goldenrod	<i>Solidago spp.</i>	Frequent
	sedges	<i>Carex spp.</i>	Occasional
	wild peavine	<i>Lathyrus spp.</i>	Occasional
<b>*site is at the edge of a wetland, rock outcrop, wet areas</b>			

#### Men's Washroom

Location	Common name	Scientific Name	Predominance
Canopy	white birch	<i>Betula papyrifera</i>	Even mix
	balsam poplar	<i>Populus balsamifera</i>	Even mix
	white spruce	<i>Picea glauca</i>	Some
Shrub strata	beaked hazel	<i>Corylus cornuta</i>	Frequent
	wild saskatoon	<i>Amelanchier alnifolia</i>	Occasional
	wild raspberry	<i>Rubus idaeus</i>	Frequent
	meadowsweet	<i>Spirea alba</i>	Occasional
	snowberry	<i>Symphoricarpos albus</i>	Occasional
Understory	bracken fern	<i>Pteridium aquilinum</i>	Frequent
	bunchberry	<i>Cornus canadensis</i>	Frequent
	trailing raspberry	<i>Rubus pubescens</i>	Occasional
	black snake-root	<i>Sanicula marilandica</i>	Occasional
	sedge	<i>Carex spp.</i>	Occasional
	bur oak	<i>Quercus macrocarpa</i>	Occasional
	prickly rose	<i>Rosa acicularis</i>	Occasional
	aster	<i>Aster spp.</i>	Occasional
	wild peavine	<i>Lathyrus spp.</i>	Occasional
	bush honeysuckle	<i>Diervilla lonicera</i>	Occasional
	coltsfoot	<i>Petasites palmatus</i>	Occasional
	false Solomon's seal	<i>Smilacina stellata</i>	Occasional
	goldenrod	<i>Solidago spp.</i>	Occasional
	wild strawberry	<i>Fragaria virginiana</i>	Occasional
	dwarf blueberry	<i>Vaccinium caespitosum</i>	Occasional
	clover	<i>Trifolium spp.</i>	Occasional
	feather moss	<i>Pleurozium schreberi</i>	Frequent
	stair step moss	<i>Hylocomium splendens</i>	Frequent



### Appendix C - Plant Species Lists for Sites

Maintenance			
Location	Common name	Scientific Name	Predominance
Canopy	green ash	<i>Fraxinus pennsylvanica</i>	Some
	trembling aspen	<i>Populus tremuloides</i>	Some
	balsam fir	<i>Abies balsamea</i>	Some
	white spruce	<i>Picea glauca</i>	Some
	white birch	<i>Betula papyrifera</i>	Predominant
Shrub strata	willow	<i>Salix spp.</i>	Occasional
	green ash	<i>Fraxinus pennsylvanica</i>	Occasional
	green alder	<i>Alnus crispa</i>	Occasional
	red-osier dogwood	<i>Cornus stolonifera</i>	Occasional
Understory	grasses	<i>grass spp.</i>	Dominant
	large leaved avens	<i>Geum macrophyllum</i>	Rare
	poison ivy	<i>Toxicodendron rydbergii</i>	Occasional
	wild strawberry	<i>Fragaria virginiana</i>	Occasional
	coltsfoot	<i>Petasites palmatus</i>	Occasional
	aster	<i>Aster spp.</i>	Occasional
	false Solomon's seal	<i>Smilacina stellata</i>	Occasional
	trailing raspberry	<i>Rubus pubescens</i>	Frequent
	prickly rose	<i>Rosa acicularis</i>	Occasional
	bur oak	<i>Quercus macrocarpa</i>	Occasional
	wild sarsaparilla	<i>Aralia nudicaulis</i>	Occasional
*leaf litter			

Staff Building			
Location	Common name	Scientific Name	Predominance
Canopy	trembling aspen	<i>Populus tremuloides</i>	(Large)
Shrub strata	willow	<i>Salix spp.</i>	Occasional
Understory	low-bush cranberry	<i>Viburnum edule</i>	Occasional
	columbine	<i>Aquilegia canadensis</i>	Rare
*wet site, wood frog occurrence.			

Septic Field			
Location	Common name	Scientific Name	Predominance
Canopy	trembling aspen	<i>Populus tremuloides</i>	Dominant
	white spruce	<i>Picea glauca</i>	Some
Shrub strata	green ash	<i>Fraxinus pennsylvanica</i>	Occasional
	wild raspberry	<i>Rubus idaeus</i>	Occasional
	beaked hazel	<i>Corylus cornuta</i>	Occasional
	green alder	<i>Alnus crispa</i>	Occasional
	red-osier dogwood	<i>Cornus stolonifera</i>	Occasional
	wild saskatoon	<i>Amelanchier alnifolia</i>	Occasional
Understory	wild strawberry	<i>Fragaria virginiana</i>	Frequent
	thistle	<i>Cirsium arvense</i>	Occasional
	poison ivy	<i>Toxicodendron rydbergii</i>	Occasional
	trailing raspberry	<i>Rubus pubescens</i>	Frequent
	prickly rose	<i>Rosa acicularis</i>	Occasional
	goldenrod	<i>Solidago spp.</i>	Occasional
	potentilla	<i>Potentilla spp.</i>	Occasional

Appendix C - Plant Species Lists for Sites			
	mint	<i>Labiatae spp.</i>	Occasional
	aster	<i>Aster spp.</i>	Occasional
	bracken fern	<i>Pteridium aquilinum</i>	Occasional
	large leaved avens	<i>Geum macrophyllum</i>	Rare
*adjacent to large grass area, not that wet			

Docks - East shoreline			
Location	Common name	Scientific Name	Predominance
<b>Canopy</b>	green ash	<i>Fraxinus pennsylvanica</i>	Dominant
	white birch	<i>Betula papyrifera</i>	Occasional
	balsam fir	<i>Abies balsamea</i>	Occasional
	American elm	<i>Ulmus americana</i>	Occasional
	black ash	<i>Fraxinus nigra</i>	Occasional
<b>Shrub strata</b>	white birch	<i>Betula papyrifera</i>	Occasional
	balsam fir	<i>Abies balsamea</i>	Occasional
	wild raspberry	<i>Rubus idaeus</i>	Occasional
	beaked hazel	<i>Corylus cornuta</i>	Occasional
<b>Understory</b>	thistle	<i>Cirsium arvense</i>	Occasional
	spotted touch-me-not	<i>Impatiens capensis</i>	Occasional

\*Shrub strata and understory were assessed using the DAFOR scale, which is based on percent cover. Dominant = >75%, Abundant = 75 – 51%, Frequent = 50 – 26%, Occasional = 25 – 11%, Rare 10 – 1 %

**Appendix D:  
Plant Data Collected at Transects**

Appendix D - Plant Data Collected at Transects						
Plot 1 - Treed Rock						
Species	1	2	3	4	5	Average
<b>Shrub stratum - 1-2.5m tall (2.5m x 2.5m plots)</b>						
<i>Alnus rugosa</i>	20	0	0	0	0	4
<i>Juniperus communis</i>	10	0	0	0	0	2
<i>Rosa acicularis</i>	2	0	0	0	0	0.4
<i>Amelanchier alnifolia</i>	2	0	0	0	15	3.4
<i>Rubus idaeus</i>	0	0	0	0	20	4
<i>Betula papyrifera</i>	0	0	0	0	5	1
<b>Herb stratum - &lt;1m tall (1-m x 1-m plots)</b>						
<i>Rubus pubescens</i>	10	30	0	0	0	8
Feather moss spp.	9	20	0	0	0	5.8
<i>Cornus canadensis</i>	8	2	6	0	0	3.2
<i>Rubus idaeus</i>	0	0	0	0	15	3
<i>Cladina</i> spp.	0	0	13	0	0	2.6
<i>Galium boreale</i>	0	0	7	0	5	2.4
<i>Solidago</i> spp.	2	3	5	0	2	2.4
<i>Rosa acicularis</i>	0	6	0	0	5	2.2
<i>Aralia nudicaulis</i>	0	0	0	0	10	2
<i>Poa</i> spp.	0	0	8	0	0	1.6
<i>Aster</i> Sp.	5	0	0	0	2	1.4
<i>Alnus rugosa</i>	0	6	0	0	0	1.2
<i>Trifolium pratense</i>	0	1	5	0	0	1.2
<i>Abies balsamea</i>	0	0	5	0	0	1
<i>Cladonia</i> spp.	0	0	0	5	0	1
<i>Hieracium umbellatum</i>	0	0	3	0	0	0.6
<i>Achillea millefolium</i>	0	0	2	0	0	0.4
<i>Galium triflorum</i>	0	2	0	0	0	0.4
<i>Lathyrus</i> spp.	0	2	0	0	0	0.4
<i>Maianthemum canadense</i>	0	2	0	0	0	0.4
<i>Ribes</i> spp.	0	0	0	0	2	0.4
<i>Taraxacum officinale</i>	0	0	2	0	0	0.4
<b>Ground Cover (1-m x 1-m plots)</b>						
litter	90	40	5	0	30	33
Rock	0	0	0	90	60	30
<i>Pleurozium schreberi</i>	0	0	70	0	0	14
Crustose lichen spp.(covering	0	0	0	30	0	6
Rock moss	0	0	0	10	15	5
liverwort (mossy like)	0	5	0	0	0	1

Plot 2 - Trembling Aspen Stand						
Species	1	2	3	4	5	Average
<b>Shrub stratum - 1-2.5m tall (2.5m x 2.5m plots)</b>						
<i>Corylus cornuta</i>	20	10	0	0	0	6
<i>Amelanchier alnifolia</i>	5	0	0	0	0	1
<i>Fraxinus</i> spp.	15	15	10	5	0	9
<i>Cornus canadensis</i>	5	0	0	2	0	1.4
<i>Rubus idaeus</i>	0	5	30	0	25	12
<b>Herb stratum - &lt;1m tall (1-m x 1-m plots)</b>						



Appendix D - Plant Data Collected at Transects						
<i>Calamagrostis sp.</i>	15	4	5	15	20	11.8
<i>Rubus idaeus</i>	0	5	20	0	20	9
<i>Rubus pubescens</i>	10	5	2	7	2	5.2
<i>Solidago spp.</i>	7	6	8	4	0	5
<i>Rosa acicularis</i>	10	0	0	0	10	4
<i>Aster Spp.</i>	2	6	5	3	0	3.2
<i>Fragaria virginiana</i>	0	2	10	3	0	3
<i>Cirsium arvense</i>	2	3	5	0	0	2
<i>Ribes spp.</i>	0	0	6	0	3	1.8
<i>Maianthemum canadense</i>	1	0	2	4	0	1.4
<i>Cinna latifolia</i>	3	4	0	0	0	1.4
<i>Cornus stolonifera</i>	0	0	2	5	0	1.4
<i>Petasites palmatus</i>	3	0	0	2	1	1.2
<i>Anemone canadensis</i>	0	0	0	2	4	1.2
<i>Toxicodendron rydbergii</i>	5	0	0	0	0	1
<i>Fraxinus pensylvannica</i>	5	0	0	0	0	1
<i>Galium boreale</i>	1	0	1	0	3	1
<i>Equisetum arvense</i>	0	0	0	4	1	1
<i>Abies balsamea</i>	2	2	0	0	0	0.8
<i>Taraxacum officinale</i>	3	0	0	0	0	0.6
<i>Mitella nuda</i>	0	0	3	0	0	0.6
<i>Geum macrophyllum</i>	0	0	3	0	0	0.6
<i>Alnus rugosa</i>	0	3	0	0	0	0.6
<i>Mint spp.</i>	0	0	0	2	1	0.6
<i>Viola spp.</i>	2	0	0	0	0	0.4
<i>Viccia spp.</i>	0	0	0	0	2	0.4
<i>Galium triflorum</i>	0	0	1	0	0	0.2
Ground Cover (1-m x 1-m plots)						
litter	40	20	15	40	20	27
moss	20	6	2	5	5	7.6
liverwort	5	4	4	0	0	2.6

Plot 3 - Balsam Fir mixedwood						
Species	1	2	3	4	5	Average
Shrub stratum - 1-2.5m tall (2.5m x 2.5m plots)						
<i>Fraxinus pensylvanica</i>	0	2	5	5	0	2.4
Herb stratum - <1m tall (1-m x 1-m plots)						
<i>Equisetum arvense</i>	3	3	20	5	5	7.2
<i>Fraxinus spp.</i>	8	0	0	20	0	5.6
<i>Mitella nuda</i>	0	2	8	10	3	4.6
<i>Aralia nudicaulis</i>	5	5	10	0	2	4.4
<i>Carex spp.</i>	0	2	7	10	2	4.2
<i>Rubus pubescens</i>	0	5	10	2	0	3.4
<i>Viola spp.</i>	0	0	10	0	3	2.6
<i>Lonicera spp.</i>	0	0	5	0	3	1.6
<i>Galium triflorum</i>	0	0	2	2	4	1.6
<i>Maianthemum canadense</i>	2	0	2	2	0	1.2
<i>Ribes spp.</i>	0	0	5	0	0	1
<i>Toxicodendron rydbergii</i>	0	0	2	3	0	1

<b>Appendix D - Plant Data Collected at Transects</b>						
<i>Dryopteris austriaca</i>	0	0	0	0	5	1
<i>Oryzopsis asperifolia</i>	0	0	2	2	0	0.8
<i>Quercos macrocarpa</i>	0	0	3	0	0	0.6
<i>Viburnum edule</i>	0	0	0	3	0	0.6
<i>Populus balsamifera</i>	2	0	0	0	0	0.4
<i>Abies balsamea</i> (small)	1	1	0	0	0	0.4
<i>Ulmus americana</i>	0	0	2	0	0	0.4
<i>Trientalis borealis</i>	0	0	0	0	2	0.4
<b>Ground Cover (1-m x 1-m plots)</b>						
litter	90	60	10	40	80	56
moss	5	30	25	20	10	18