5298 Alta Lake Road
Whistler, BC

Initial Environmental Review: Update

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PGL ENVIRONMENTAL CONSULTANTS

solve and simplify

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List of Acronyms

CDC	-	BC Conservation Data Centre
IER	-	Initial Environmental Review
PGE	-	Pacific Great Eastern
PGL	-	PGL Environmental Consultants
QEP	-	Qualified Environmental Professional
RAR	-	Riparian Areas Regulation
RMOW	-	Resort Municipality of Whistler
ROW	-	Right-of-Way
SAR	-	Species at Risk
SPEA	-	Streamside Protection and Enhancement Area

1.0 INTRODUCTION

PGL Environmental Consultants (PGL) is pleased to provide this Initial Environmental Review (IER) Update for the property at 5298 Alta Lake Road, Whistler, BC (the Site). An IER was formerly prepared for the Site in 2000 by Cascade Environmental Resource Group Ltd. (Cascade) (Appendix 1). This IER Update is a requirement of the Resort Municipality of Whistler's (RMOW) rezoning application process and follows the IER Terms of Reference, as provided by the RMOW. The 9.5-acre property, on the northwest shore of Nita Lake (Figure 1), is currently mostly vacant and forested with two small cabins occupying the center of the Site. We understand that Empire Club Development Corporation (Empire) has proposed the development of a 32-unit townhouse complex, consisting of 7 buildings and several amenities and service structures at the Site, in addition to a valley trail along the eastern property boundary (Appendix 2).

This IER Update identifies any environmental sensitivities and/or constraints that may exist for the project, outline measures to mitigate the impacts of the updated project, and identify any potential environmental permitting or approvals, which may be required prior to development.

1.1 Scope

Existing environmental information for the assessment area was compiled during a desktop review. The desktop review identified an overview of the constraints to development at the Site. This task also focused the areas of interest for the field visit, including geology, geomorphology, hydrology, cultural and heritage resources, fish and aquatic habitat, riparian habitat, wildlife and wildlife habitat, vegetation, invasive plants, species at risk (SAR), and ecosystems at risk.

PGL completed desktop reviews and field surveys for the Site to provide Empire with a high-level IER Update. This assessment focused on:

- Plant and animal species at risk;
- Terrestrial habitat and ecosystems at risk;
- Invasive species; and
- Aquatic habitat.

We have provided a summary of the results of our desktop and field surveys related to the Site and adjacent areas. Additionally, the conclusions sections at the end of this report provides recommendations that the Empire should consider in the development of the Site.

1.2 The Project Team

The field program and report preparation were conducted by vegetation ecologist Ashleigh Gilbert (M.Sc., P.Ag.) and fish and wildlife biologist Katharine Scotton (B.Sc., R.P.Bio.). Senior review was performed by Principal Susan Wilkins (M.Sc., P. Geo.). All project team members have experience in conducting environmental inventories, reviews, and assessments.

1.3 Methodology

To complete the IER Update, PGL conducted a desktop review. We:

- Reviewed Cascade's IER for the Site from 2000 (Appendix 1);
- Reviewed Bunbury & Associates Land Surveying Ltd.'s August 2018 Site survey;
- Reviewed R. F. Binnie & Associates' August 2018 *Preliminary Servicing Report – Empire Club Developments Proposed Townhouse Development Hillman Property*;
- Reviewed orthophotographic/aerial imagery and available base maps of the Site, paying attention to watercourses, potential habitat areas, infrastructure locations, and general land uses and disturbance;
- Identified fish-bearing watercourses near the Site, as indicated by internet-based federal and provincial databases (BC Ministry of Environment Habitat Wizard, BC Ministry of Environment Fisheries Inventory Database Queries Tool);
- Reviewed the Resort Municipality of Whistler's Online Web Map;
- Reviewed the University of British Columbia's E-Fauna: Electronic Atlas of the Wildlife of British Columbia for distribution and habitat suitability;
- Reviewed the University of British Columbia's E-Flora: Electronic Atlas of the Plants of British Columbia for distribution and habitat suitability;
- Reviewed distribution and habitat suitability characteristics for SAR provided by the BC Conservation Data Centre (CDC) (see Appendix 1 for SAR status definitions), and iMapBC; and
- Cross-referenced provincial SAR search results with Environment Canada's SAR database[1] to ensure that federally designated species likely to occur in the study area (based on habitat requirements) were captured by the CDC search.

We also conducted a field visit on May 15, 2018, at the Site to ground-truth existing information gathered from the desktop research exercise and the previously prepared IER by Cascade. The weather during the Site visit was warm and dry with light wind. Conditions were ideal for the Site survey, as the ground was free of snow, and spring vegetation had emerged.

The results of the desktop review and Site work are described in the following sections on vegetation, wildlife, fish, municipal stream classifications, and SAR. The information obtained from the identified resources, in combination with our Site visit (described in Section 4.0), was sufficient to complete our IER.

2.0 EXISTING ENVIRONMENTAL CONDITIONS

The Site is located in the Resort Municipality of Whistler in the Squamish Lillooet Regional District. Situated on the west side of Nita Lake, the Site is sloped to the east and primarily vacant and forested. A CN Rail (formerly referred to in Cascade's IER as BC Rail) Right-of-Way (ROW) bounds the Site to the east, running between the Site and Nita Lake. A BC Hydro Transmission ROW bounds the Site to the west. A residential subdivision is located directly south of the Site. Tyrol Ski and Mountain Club, with Tyrol Resort, are north of the Site. Gebhardt Creek flows through the northern portion of the Site draining into Nita Lake.

[1] http://atlas.nrcan.gc.ca/site/english/maps/environment/ecology/threats/speciesatrisk

Site access was originally gained from the north via Alta Lake Road. A gravel road and wood bridge spanning Gebhardt Creek connects Alta Lake Road to the onsite residence and gravel pad. The construction of a secondary Site entrance, located at the southern end of the property, coincided with the development of the residential lots on Nita Lake Drive and Jordan Lane. The gravel access road was extended from Nita Lake Road to the existing onsite gravel road and infrastructure in the mid-2000s. Engineering utility infrastructure, such as fire hydrants, have been installed along the access road.

2.1 Physical Environment

2.1.1 Climate

Whistler is the closest active Atmospheric Environment Service climate station with long-term records. The Whistler climate station is located 4.5km northeast of the Site at an elevation of 658m above sea level, which is similar in elevation to the Site (640 to 690m). The station provides 29-year average data from 1981 to 2010. The data from the station are summarized in Table A.

Table A: Climatic Data – 29-year Averages (1981 to 2010)

		Whistler
Temperature	Warmest Month (mean temperature)	August (16.5 °C)
	Coldest Month (mean temperature)	December (2.8 °C)
	Annual Mean	6.7 °C
Precipitation	Lowest (total precipitation)	July (44.7mm)
	Highest (total precipitation)	November (192.1mm)
Total Precipitation	Annual	1227.7mm

2.1.2 Surficial Geology

Surficial geology at the Site is characterized by Colluvial Deposits of diamicton (unsorted mixed sediment) and rubble deposited by various mass-wasting processes, ranging from slope wash to rock fall; composition dependent of source material. Bedrock outcrop is also present at the Site, particularly within the southern portion of the Site.

The colluvial veneer is thin, and consists of rock fragments in a matrix of boulders, gravel sand, silt, is usually less than 3m thick and developed from weathering bedrock or the reworking of unconsolidated deposits. Bedrock is sedimentary, low-grade metamorphic, volcanic, or intrusive in composition, ranging from the Jurassic to Quaternary periods. The bedrock may also include till veneer, drift and colluvium (Blais-Stevens, 2008).

2.1.3 Geomorphology

The Site geomorphology was hummocky, with shallow soils over bedrock, bare rock outcrops and benches, and evidence of seasonal or extinct drainages. The Site is steep to moderately sloped from the upper west side and downhill to the east, at Nita Lake. The Site ranges in elevation between approximately 640m at Nita Lake, to 690m at the BC Hydro Transmission Line ROW. Angular boulders and cobbles were present in the drainages.

2.1.4 Hydrology

2.1.4.1 Gebhardt Creek

Gebhardt Creek is an approximately 4.1km long creek flowing from west to east, draining the Mount Sproatt range into Nita Lake (Figure 1). An 80m section of Gebhardt Creek flows west to east at the north end of the Site. The creek is confined in a bedrock ravine in the uppermost reach at the Site (Photograph 1). A wooden bridge crosses the creek where the gravel access road transects the Site. Downstream of the bridge, the creek is less confined, and evidence of a seasonal floodplain was observed (Photograph 2). At the eastern property boundary, a pair of twin 1.0m by 0.6m oval culverts pass under the CN Rail tracks and discharge to a delta on Nita Lake, outside the property boundary. The left (facing downstream) culvert was partially blocked with small woody debris, and thus most flow was passing through the right culvert. The culverts were perched above the streambed on the downstream side, with a vertical drop of 0.6m. The discharge from the culverts has formed a small pool, which then flows approximately 70m in a braided channel to Nita Lake.

Flows within Gebhardt Creek were well within the confines of the channel during the May 15, 2018, site visit. However, evidence of seasonal or storm event overbank flooding in the downstream reach was observed. Additionally, the boulders in the ravine suggest heavier flows during storm events or during the rainy season. The ravine reach above the bridge did not have evidence of flooding beyond the top of bank, and likely has enough capacity to contain seasonal and storm event flooding.

A small channel to the south of Gebhardt Creek was observed to cross the access road through a 0.6m corrugated metal culvert perched above the channel. The channel was mostly dry below the access road (Photograph 3) and was approximately 0.7m wide with an average gradient of 15% close to the access road. The channel joined the Gebhardt Creek floodplain of the lower reach of Gebhardt Creek, just upstream of the CN Rail tracks. In the flatter section of the flood plain, the channel was dry, with gravels exposed due to scour. Closer to the access road, the grade of the channel was steeper and angular boulders and cobbles were observed, with old silt fence visible on the channel margin. Upstream of the access road, the channel had some flow, with other sections dry and water flowing subsurface/infiltrating to ground. A concrete headwall diverted water through to the culvert under the access road. The channel upstream of the access road had a step-pool morphology (Photograph 4), and was 1.4m wide and 15% on average in gradient. It is suspected that this channel is the man-made diversion channel described in the Cascade 2000 report.

A detailed Site survey was completed by Bunbury & Associates Land Surveying Ltd. On August 16, 2018. The professional survey included mapping of the main channel of Gebhardt Creek and the lower portion of the side channel (Appendix 3).

2.1.4.2 Nita Lake

Nita Lake is a small (1,737m perimeter) lake situated between Alta Lake and Alpha Lake. Nita Lake receives water from Gebhardt Creek on the Site, Millar Creek connecting Alta Lake from the north to Nita Lake, and Whistler Creek from the southeast. Nita Lake drains to Alpha Lake to the southwest via Millar Creek. Several unnamed seasonal drainages also enter Nita Lake. Nita Lake is separated from the Site by the CN Rail tracks and the berm the tracks are built upon.

2.1.4.3 Drainages

Evidence of several intermittent seepages or extinct drainages were observed at the Site (Photograph 5). The seepages were generally dry at the time of the site visit, and likely only convey site runoff during storm events and snowmelt.

2.1.4.4 Pool

A shallow pool was observed in the southeast corner of the Site (Photograph 6). This pool is consistent with descriptions of a pool in the same area in the Cascade 2000 report. The pool contained aquatic invertebrates, and juvenile trout approximately 75mm in fork length was noted swimming in the pool. The trout was assumed to be a rainbow trout, but species could not be confirmed. The observation of the fish was surprising given the appearance of isolation from Nita Lake and other watercourses. However, on observation of the Nita Lake side of the CN Rail tracks that separate the pool from the lake, a possible connection beneath the CN Rail tracks was noted as probable.

The detailed Site survey completed by Bunbury & Associates Land Surveying Ltd. On August 16, 2018 also mapped the extent of the wetted area of the pool feature.

2.1.4.5 Floodplain

The floodplain of Gebhardt Creek in the lower reach of the Site was measured as approximately 7.5m wide from the wetted margin of the creek on the north (stream left). The creek at his point was measured at 6.5m wetted width at the widest point. The creek significantly flattens and widens out in the floodplain area of Polygon 5, with combined floodplain and stream width of 14m. On the south side (stream right), there was less evidence of a floodplain; however, large woody debris near the creek confirmed at least seasonal high flows outside the creek bed.

2.2 Terrestrial Environment

2.2.1 Soils

Soils at the Site are thin and shallow with bedrock occurring within 50cm of the surface that developed from weathered glacial till and/ or colluvium. Soil textures are gravelly sandy loam or gravelly loamy sand.

Site soils were identified as Lithic Ortho Humo-Ferric Podzols and Orthic Humo-Ferric Podzols (Luttmerding 1971).

2.2.2 Vegetation

The Site is in the Southern Moist Submaritime Subzone Variant of the Coastal Western Hemlock Biogeoclimatic Ecosystem Classification Zone (CWHms1).

All descriptions of Biogeoclimatic Ecosystem Classification subzone characteristics provided below are derived from *A Field Guide to Site Identification and Interpretation for the Vancouver Forest Region* (Green and Klinka 1994).

The CWHms1 variant occurs between 650m to 1,200m elevation in the eastern portion of the Coast Mountains, from Harrison Lake to the Homathko River, and between 900m to 1350m elevation in the drainages of the upper Fraser River to the east and north of Chilliwack.

Climate in the Coastal Western Hemlock Biogeoclimatic Ecosystem Classification Zone is characterized by wet, humid, and mild maritime conditions with little snowfall and long growing seasons. The CHWms1 variant is characterized by moist, cool winters and cool but relatively dry summers.

Zonal, undisturbed plant communities (i.e., those influenced by moderate soil moisture and nutrient regimes) are characterized by forest stands dominated by western hemlock (*Tsuga heterophylla*), amabilis fir (*Abies amabilis*), and western red-cedar (*Thuja plicata*).

The understory is typically dominated by a well developed-moss layer consisting of step moss (*Hylocomium splendens)*, pipecleaner moss (*Rhytidopsis robusta)* and red-stemmed feathermoss (*Pleurozium schreberi)* and blueberries (*Vaccinium* sp.), while herb layers are less developed and commonly contain falsebox (*Paxistima myrsinites*), bunchberry (*Cornus canadensis*), queen's cup (*Clintonia uniflora*), five-leaved bramble (*Rubus pedatus*), and one-sided winter green (*Orthilia secunda*).

2.2.3 Wildlife & Wildlife Habitat

Ecoprovinces are classified areas with consistent climatic processes and relief at a sub-continental level. Associated ecological descriptions of BC's 11 ecoprovinces provided by the Ministry of Environment and Climate Change Strategy have been used to summarize general wildlife characteristics and identify potential wildlife species that may frequent the Site. The Site is in the Coast and Mountains Ecoprovince, the Western Pacific Ranges Ecoregion, and the Eastern Pacific Ranges Ecosection.

The following section provides general wildlife descriptions for the Coast and Mountains Ecoprovince, and identifies species that may occur at the Site, as provided by the Ministry of Environment and Climate Change Strategy (Demarchi 2010).

Coast and Mountains Ecoprovince

The most common ungulates in this ecoprovince, and species known to occur in the region of the Site, are the Columbia black-tailed deer (*Odocoileus hemionus columbianus*), Roosevelt elk (*Cervus elaphus roosevelti*), and mountain goats (*Oreamnos americanus*) in the rugged mountains. American black bear (*Ursus americanus*) is common throughout the ecoprovince, as well as grey wolf (*Canis lupus*) and cougar (*Puma concolor*).

Common small mammals found throughout the Coast and Mountains Ecoprovince include Keen's myotis (*Myotis keenii*), American mink (*Neovison vison*), Townsend's vole (*Microtus townsendii*) and white-footed mouse (*Peromyscus keeni*).

Eighty percent of the bird species known to occur in BC and 60% of all species known to breed in the province are found in the Coast and Mountains Ecoprovince. Bald Eagle (*Haliaeetus leucocephalus*) and Peregrine Falcon (*Falco peregrinus*), are species that are more abundant in the Coast and Mountains Ecoprovince than anywhere else in their respective ranges, and support significant portions of the world's population. Passerine species of note are the Townsend's Warbler (*Setophaga townsendi*) and Pacific-slope Flycatcher (*Empidonax difficilis*).

The northwestern garter snake (*Thamnophis ordinoides*) is highly abundant in the Coast and Mountains Ecoprovince. Amphibians that are mostly restricted to the ecoprovince include the roughskin newt (*Taricha granulosa*), northwestern salamander (*Ambystoma gracile*), western red-backed salamander (*Plethodon vehiculum*), ensatina (*Ensatina eschscholtzii*), wandering salamander (*Aneides vagrans*), and red-legged frog (*Rana aurora*).

2.2.3.1 Onsite Observations

Wildlife observed at the Site included red-breasted nuthatch (*Sitta canadensis*), orange-crowned warbler (*Vermivora celata*), Hammond's flycatcher (*Empidonax hammondii*), warbling vireo (*Vireo gilvus*), black-throated gray warbler (*Setophaga nigrescens*), spotted towhee (*Pipilo maculatus*), golden-crowned kinglet (*Regulus satrapa*), yellow-rumped warbler (*Setophaga coronata*), chestnut-backed chickadee (*Poecile rufescens*), American robin (*Turdus migratorius*), and rufous hummingbird (*Selasphorus rufus*). A pileated woodpecker (*Hylatomus pileatus*), and common raven (*Corvus corax*) were observed offsite. American black bear (*Ursus americanus*) scat and a Douglas squirrel (*Tamiasciurus douglasii*) were also observed in Polygon 1 (Figure 2).

2.3 Aquatic Environment

Nita Lake (Watershed Code: 900-097600-12900-53800) is located about 20m east of the Site. Nita Lake connects to Alta Lake (Watershed Code: 119-467100-98100) to the northeast and Alpha Lake (Watershed Code: 900-097600-12900-53800) to the southwest via Millar Creek (Watershed Code: 900-097600-12900-53800). Nita Lake was historically stocked with Kokanee (*Oncorhynchus nerka*) and Rainbow Trout (*Oncorhynchus mykiss*). Gebhardt Creek (no watershed code available) flows through the northern portion of the Site forming a small delta on the western shore of Nita Lake, to the east of the BC Rail ROW.

Gebhardt Creek is considered non-fish bearing above the CN Rail tracks. However, the creek is suitable habitat for coastal tailed frog (*Ascaphus truei*), with year-round flow, step-pool morphology, and large boulders and bedrock.

The pool in the southeast corner of the Site was observed to have at least one juvenile trout (species not confirmed, but likely rainbow trout), and aquatic invertebrates. It is unknown how the pool connects to the Lake; however, it is suspected that a subsurface connection, either by culvert or erosion, connects the pool to Nita Lake.

2.4 Socio-Economic Conditions

2.4.1 Cultural and Heritage Resources

As per Cascade's 2000 IER, the Site was originally owned by the Pacific Great Eastern Railway. Resident Elizabeth (Betty) Gebhardt purchased the property in 1937. Betty Gebhardt maintained a garden on the delta (Polygon 8), the lands remained property of Pacific Great Eastern Railway, and finally CN Rail, until the title was transferred to the RMOW as parkland in 1999.

Two buildings remain on the Site: the main house and a small shed. Both structures are built of wood, are rustic in style, and in moderate condition. A wooden bridge over Gebhardt Creek along the access road is also in place, though holes in the planking are present.

2.4.2 Other Undertakings in The Area

Other developments and business in the area of the Site include Tyrol Ski and Mountain Club to the north, residential developments to the south, CN Rail tracks to the east, and BC Hydro transmission lines and ROW to west.

2.5 Valued Ecosystem Components

The original terrestrial ecosystem mapping and vegetation association units described in the 2000 Cascade IER have been matched as closely as possible; however, with the absence of the figures in the Cascade report that was provided, the polygons described below may not have exactly the same boundaries (Figure 2). Additionally, a ninth polygon was added to describe the area of bedrock and young trees adjacent the BC Hydro transmission ROW.

2.5.1 Polygon 1 – Upland slopes (majority of Site)

The uplands portion of the Site is characterized as a mature forest, with trees reaching approximately 35-40m in height (Photograph 7). Crown closure of the canopy is approximately 60%. Soils were thin and shallow with occasional bedrock outcrops or exposed boulders. Topography was hummocky. The dominant tree species were western hemlock and Douglas fir with some western redcedar and occasional amabilis fir (*Abies amabilis*), yellow cedar (*Xanthocyparis nootkatensis*), red alder (*Alnus rubra*), black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), Douglas maple (*Acer glabrum*) and western yew (*Taxus brevifolia*). Groundcover consisted of a well-developed moss layer with few scattered rock outcrops and coarse woody debris. Shrub species observed included oval leaf blueberry (*Vaccinium ovalifolium*), red huckleberry (*Vaccinium parvifolium*), falsebox and saskatoon berry (*Amelanchier alnifolia*). Common herbs were Hooker's fairy bells (*Prosartes hookeri*), false Solomon's seal (*Maianthemum racemosum*), prince's pine (*Chimaphila umbellata*) and rattlesnake plantain (*Goodyera oblongifolia*). Rare occurrences of bunchberry and western coral root (*Corallorhiza mertensiana*) were also observed.

Water was observed flowing in a side channel/man-made diversion channel (as described in Section 2.1.4) from a small culvert, south of the onsite buildings, onto an area of boulders and cobbles. The water infiltrated to ground and was not observed at any other downstream points along the drainage channel. The drainage was characterized by a steep upper section of exposed bedrock, large boulders and cobbles that transformed through a series of pools to a more gently sloped, gravelly bottomed channel that diverts towards Gebhardt Creek.

2.5.2 Polygon 2 – Steep and cool upper slope

This steep upper slope at the southwest end of the Site was similar in canopy and tree structure to Polygon 1, with a cooler aspect and steeper slopes. Red huckleberry, falsebox and oval leaf blueberry were abundant in the understory. Seeps in the area had an increase in moss cover, with occurrences of bunchberry, rose (*Rosa* sp.), and sword fern.

2.5.3 Polygon 3 – Lowland slope

Polygon 3 consists a similar, yet younger, forest composition to Polygon 1; additionally, there was more evidence of logging and anthropogenic modification. Canopy cover was approximately 70%. Moss was observed growing on small areas of exposed bedrock and boulders, most notably along the seeps. Understory composition consisted of highbush cranberry (*Viburnum edule*), western mountain ash (*Sorbus scopulina*), false Solomon's seal, falsebox, saskatoon (*Amelanchier alnifolia*), oval leaf blueberry and red huckleberry. The density of understory vegetation varied with elevation and aspect.

Small seeps and low-lying areas with higher soil moisture occurred in the southern portion of this polygon. These areas typically showed a great diversity of plant species including occurrences of bunchberry, western oak fern (*Gymnocarpium disjunctum*) and sword fern (*Polystichum munitum*). Moss coverage was also greater, showing less signs of desiccation that other areas onsite.

2.5.4 Polygon 4 – Pool

A small pool is located along the eastern property line, formed by the construction of the rail line obstructing the flow of water from upgradient drainages and seeps. The eastern shoreline of the pool is steep and consist of rail line ballast and boulders while the rest of the shore line was more gently sloped and covered with forest detritus, coarse woody debris and the occasional boulder. Canopy cover was about 25%. Western redcedar, western mountain ash, black twinberry (*Lonicera involucrata*), lady fern (*Athyrium filix-femina*), black gooseberry (*Ribes lacustre*) and thimbleberry (*Rubus parviflorus*) grew around the pond. Devil's club (*Oplopanax horridus*), red alder and pin cherry (*Prunus pensylvanica*) were observed to the north of the pond (Photograph 8).

2.5.5 Polygon 5 – Lower Reach Gebhardt Creek

Gebhardt Creek flows southeast through the Site into Nita Lake. Onsite, the upper portion of Gebhardt Creek is contained within a steep sided rocky ravine while the lower portion flattens out. Gebhardt Creek flows under the elevated rail line, separating the Site from Nita Lake, through twin metal culverts. The canopy cover at the lower portion of Gebhardt Creek is approximately 40%, with the northern bank more open that the southern bank. Coarse woody debris was common within this polygon. Red alder, western redcedar, Douglas maple and black cottonwood were common with thimbleberry, hardhack, Sitka columbine (*Aquilegia formosa*), saskatoon, kinnikinnick (*Arctostaphylos uva-ursi*), and non-native dandelion (*Taraxacum officinale*), oxeye daisy (*Leucanthemum vulgare*), St.John's wort (*Hypericum perforatum*) growing along the forest edge.

2.5.6 Polygon 6 – Anthropogenic/Disturbance areas

This polygon includes the gravel access road (Photograph 9) off Nita Lake Drive and adjacent utility corridor, gravel parking areas, buildings and lawn. Evidence of clearing and grubbing was observed along the gravel access road, likely completed during the construction of the road and utility corridor.

Sapling and juvenile alder, willow (*Salix* sp.) and black cottonwood grew along the roadway. Shrub and understory species included red osier dogwood (*Cornus stolonifera*), pin cherry, western mountain ash, winter current (*Ribes sanguineum*), saskatoon, thimbleberry, salmonberry (*Rubus spectabilis*), red elderberry (*Sambucus racemosa*), black gooseberry, fireweed (*Epilobium angustifolium*), falsebox, wild strawberry (*Fragaria virginiana*) and oval leaf blueberry. Non-native weedy species such as hawkweed (*Hieracium* sp.), dandelion, oxeye daisy, clover (*Trifolium* sp.) and grass were common along the road.

These areas were open and gently sloping to sloping to the north. The west side of the road was characterised by recessed drainage ditches, piles of boulder and coarse woody debris and exposed bedrock outcrops; while the east side of the road was characterised by a gravel shoulder constructed of cobbles and boulders that dropped steeply to the forested areas below.

Stream violet (*Viola glabella*), bedstraw (*Galium* sp.), goats beard (*Aruncus dioicus*), Douglas maple, red elderberry, and Sitka columbine were observed in pockets among the house, lawn and gravel areas.

2.5.7 Polygon 7 – Rock outcrop

Located outside of the Site boundaries, east of the rail line, Polygon 7 is a small bedrock outcrop that extends into Nita Lake (Photograph 10). The outcrop area supports juvenile to mature Douglas-fir, western redcedar, lodgepole pine. Canopy cover is open, about 25%. Thin soils, exposed bedrock and relatively large patches of bare ground are common within the polygon. Shrub species include red alder, saskatoon berry, red elderberry, western mountain ash and oval leaf blueberry with hardhack (*Spiraea douglasii*) dominating the waters edge. Evidence of recreational use, access trail and a recently used fire pit, were observed.

2.5.8 Polygon 8 – Gebhardt Fan

Gebhardt Creek flows through the Site before crossing under the rail line through a culvert and forming a small low bench floodplain on the western shore of Nita Lake. Gebhardt Creek braids through the floodplain (Photograph 11) creating a matrix of sandy, gravel deposits and saturated organic soils. Grade was relatively flat, gradually sloping towards Nita Lake, with three main creek channels and shallow, saturated depressions. Canopy cover was approximately 60%. The floodplain is generally characterized by a forest of sapling pole red alder with a few western redcedars of different ages.

A dense growth of red osier dogwood dominated the gravelly soils to the south of Gebhardt Creek culvert. Bleeding heart (*Dicentra formosa*), Hooker's fairy bells and twinberry were observed growing amongst the red osier dogwood. Red elderberry, black twinberry, lady fern, high bush cranberry, saskatoon berry, salmon berry, goat's beard and western oak fern formed the understory of the alder forest. Sections of the floodplain with ponded or slow-moving water also supported hardhack, devil's club and skunk cabbage (*Lysichiton americanus*).

2.5.9 Polygon 9 – Adjacent BC Hydro Line

An opening in the dense canopy of the adjacent Polygon 1 areas was observed where the Site boundary was in close proximity to the BC Hydro transmission ROW. The area was perched on a rock outcrop with thin soils (Photograph 12). Tree cover was sparse with young black cottonwoods and red cedars that were unhealthy or dying. Saskatoon berry and oval leaf blueberry were present as mid-story shrubs, and desiccated mosses covered the rock.

2.5.10 Wildlife Trees

Wildlife trees were frequently encountered at the site. Wildlife trees observed included feeding trees for woodpeckers, and cavities for nesting (Photograph 13). Large, rectangular pileated woodpecker feeding cavities were of note (Photograph 14). Nest cavities observed ranged in size and age; however, most cavities were in the size range of those created by northern flicker. The nest cavities were often between 5 and 10m from the ground, and of the appropriate size to be used by secondary cavity nesters such as Northern saw-whet owl (*Aegolius acadicus*), Northern pygmy owl (*Glaucidium gnoma*), Western screech-owl (*Megascops kennicottii*), Northern flying squirrel (*Glaucomys sabrinus*), and Douglas squirrel, among other bird and mammal species. Cavities at the base of trees were also observed, with space for medium-sized mammals, such as fisher (*Martes pennanti*) and American mink (*Neovison vison*). Large veteran trees may also provide valuable sites for roosting raptors, and potentially nesting. No raptor nests were observed on site.

The wildlife trees on site were a mixture of standing dead trees (snags) or stumps, and live coniferous trees. Feeding holes were observed in snags and stumps, as expected, while cavities were often in living trees.

2.5.11 Coarse Woody Debris

Coarse woody debris was generally abundant at the site, particularly in Polygons 1, 2, and 3. Large pieces of coarse woody debris were in the form of fallen or cut trunks of mature trees, and large stumps from previously logging in the area. Smaller coarse woody debris was also present in Polygons 4 and 8, and consisted of branches or fallen deciduous trees. The abundance of coarse woody debris at the Site provides adequate habitat for terrestrial invertebrates and amphibians, as well as small mammals, such as voles and shrews.

Coarse woody debris was not present in Polygon 7, likely due to the presence of a fire pit for recreation purposes.

2.5.12 Wildlife Movement Corridors

The Site is bordered by a wide BC Hydro transmission line ROW, roads and developments, CN Rail tracks and Nita Lake. The east side of Nita Lake is currently more developed; therefore, the west side of Nita Lake at the Site may offer the best location for wildlife to travel north-south if following the lakeshores. Traversing through the Site would require wildlife to cross multiple roads, watercourses and seeps, and travel near developments and the rail tracks. The BC Hydro ROW may offer ease of passage for species such as black bear or mule deer, which are tolerant of open habitat.

2.5.13 Species at Risk

PGL searched the provincial CDC Species and Ecosystems Explorer database for the Site. The CDC search identified a variety of Red-listed (endangered or threatened in BC) and Blue-listed (special concern in BC) animal and plant SAR that potentially occur on the Site. Species lists derived from the CDC search were cross-referenced with Environment Canada's SAR database (Natural Resources Canada) to ensure that federally designated species likely to occur in the study area (based on habitat requirements) were included. In addition, the CDC was consulted to recognize provincially listed ecosystems at risk within the CWHms1 Subzone Variant that could potentially occur on the Site. Descriptions of the SAR listings are in Appendix 4.

Detailed surveys for focal wildlife, plant, and ecosystems of conservation concern (i.e., listed by the CDC and/or protected under the *Species at Risk Act*) were not included in the scope of this screening-level assessment. Therefore, it is assumed that the listed species and ecosystems that use habitat types provided in or around the Site may potentially occur in this area.

All animals, plants, and ecosystems of conservation concern potentially associated with the Site are listed in Tables 1 through 3, respectively. The provided lists are comprehensive; however, species that prefer habitat conditions not likely present in the vicinity of the existing infrastructure are acknowledged wherever possible. A detailed habitat suitability assessment would likely result in a smaller, more Site-specific list of potential species. The Whistler Biodiversity Project (Brett 2016) identifies a comprehensive list of lichens, plants, and animals at risk that are likely to occur within the RMOW. The report also identifies species which are not likely to occur. The Whistler Biodiversity Project was used to edit Tables 1 and 2.

The CDC Internet Mapping Service was also reviewed to confirm the presence/absence of known masked sensitive occurrences (occurrences are identified, but species information is not publicly available) and non-sensitive occurrences (species information is publicly available) of SAR and ecosystems at risk on or within 1km of the Site. There were no known masked or non-confidential occurrences found to occur on, or within 1km of the Site.

The descriptions in the Cascade 2000 report detailing potential at risk species is still generally accurate and relevant, though designations have changes for many species since 2000. Wildlife species at risk likely to occur onsite include little brown myotis (*Myotis lucifugus*) (federally endangered under the *Species at Risk Act* and Committee on the Status of Endangered Wildlife in Canada), and Keen's myotis (*Myotis keenii*) (Blue-listed in BC). Hutton's vireo (*Vireo huttoni*) and Townsend's big-eared bat (Corynorhinus townsendii) have been downgraded to Yellow-listed in BC, while spotted owl (*Strix occidentalis*) is likely extirpated (Brett 2016). Coastal tailed frog is highly likely to occur in Gebhardt Creek given observations in other local creeks in recent years (Brett 2016).

Northern red-legged frog (*Rana aurora*) and western toad (*Anaxyrus boreas*) are both *Species at Risk Act*- and Committee on the Status of Endangered Wildlife in Canada-listed species of concern (Schedule 1), and are provincially Blue- and Yellow-listed, respectively. These species may be present in and around the wetland and the pool feature in the southeast corner of the Site.

2.6 Sensitive Ecosystems

2.6.1 Connectivity Corridors

The areas surrounding Nita Lake and the other adjacent lakes (Alta and Alpha) are developed, with roads, CN Rail track, and the BC Hydro transmission line ROW. The landscape is fragmented, and the Site does not represent a significant wildlife corridor.

2.6.2 Cottonwood Presence

Black cottonwood was only present in open areas adjacent Nita Lake or the BC Hydro transmission ROW. Most individual cottonwoods observed were saplings, or small trees.

2.6.3 Old CWH

The Site contains some old growth veteran conifers and tall, mature conifers including western redcedar, yellow cedar, western hemlock and Douglas fir. A tree survey of the site by a qualified arborist is recommended to identify trees of importance for retention, and to locate any hazard trees that may pose a safety risk.

2.6.4 Forested Floodplains

Gebhardt Creek forms a small braided channel delta on the downstream side of the BC Rail ROW, east of the Site. Onsite, Gebhardt Creek is confined to a ravine. The steep nature of the Site, the confinement of Gebhardt Creek and the position of the BC Rail ROW, between the Site and Nita Lake, suggest flooding at the Site is not a concern.

2.6.5 At Risk Terrestrial Ecosystems

Based on search of the BC CDC, there is the potential 11 provincially plant communities to occurred at the Site. Two of the 11 identified plant communities, amabilis fir – western redcedar/oak fern (Polygon 3) and Douglas-fir – western hemlock/falsebox (Polygon 1), are likely to occur based on the soils and vegetation composition of the Site.

These plant communities are vulnerable to decline due to disturbance from forest practices and road construction. Recovery of these communities can take 80-100 years, and up to 200 years for old growth characteristics (BC CDC, 2016).

Additionally, rocky outcrops and seeps, both of which were identified onsite, can be features that provide habitat for rare or endangered plants and animals.

2.6.6 Core Unlogged Forests

Evidence of logging was present throughout the Site. Stumps of coniferous trees of varying sizes were present, and often had springboard notches visible. Recent logging evidence was not observed.

2.6.7 Lakes

Nita Lake is adjacent to the Site and is connected to the Site via Gebhardt Creek and the pool at the southeast corner of the Site. As described above, Nita Lake has historically been stocked with Kokanee and rainbow trout. Nita Lake is connected to downstream lakes and upstream lakes, Alpha Lake and Alta Lake, respectively.

2.6.8 Riparian

The RMOW has identified a 30m hydrography buffer along Gebhardt Creek and the shoreline of Nita Lake, in addition to a similar 30m riparian buffer (Figure 3). The riparian buffer covers the full onsite extent of Gebhardt Creek. A narrow, 60m section in the southeast corner of the Site, where the shoreline of Nita Lake is about 20m east of the Site, is mapped within the riparian buffer.

Suggested riparian buffers have been included for the pool and side channel features, which are identified in Figure 3 as recommended Riparian Assessment Areas (RAAs).

The current revised design plans (October 2018, Appendix 2) have incorporated the results of the August 2018 professional site survey such that all building structures have now been positioned outside of the riparian, hydrography, and recommended RAA buffers. The Valley Trail and a portion of re-contoured slope below the townhouse complex in the southeast corner of the Site remain within the 30m recommended RAA for the pool.

2.6.9 Intermittent Drainages

Seeps and dry drainages were present within the Site. These features may convey groundwater or be seasonal runoff channels for snowmelt. Seeps may provide habitat for rare or endangered plants.

2.6.10 Wetlands

The pool feature of the Site at the southeast corner represents wetland habitat as well as fish habitat. The pool and associated wetland may provide potential habitat for amphibians, invertebrates, and rare plants.

3.0 ENVIRONMENTAL CONSTRAINTS

The following sections address the environmental constraints associated with development at the Site, including physical, terrestrial, and aquatic environments.

3.1 Environmental Sensitivity & Development Constraints (Protection of The Natural Environment)

The RMOW identifies development setbacks for riparian habitat and hydrography values. These setbacks are shown in Figure 3. Additionally, the RMOW has adopted the Riparian Areas Regulation (RAR), which is discussed in Section 3.4.

3.2 Physical Environment

The following sections discuss the physical environment constraints to development. Constraints due to the location of the Site next to Nita Lake and the presence of Gebhardt Creek significantly limit development.

3.2.1 Climate

Considerations for development related to climate include provisions for precipitation, snowfall, site runoff, and fluctuating temperature extremes. Snowfall removal strategies should be developed to provide access and clear roads in the winter.

3.2.2 Geology

A separate geotechnical study should be completed to adequately address the development constraints resulting from the geological characteristics of the Site.

3.2.3 Geomorphology

The steep nature of the site, and the presence of seeps, rocky outcrops, and depressions create a challenging terrain. A separate geotechnical study should be completed to adequately address the development constraints resulting from the geomorphological characteristics of the Site.

3.3 Terrestrial Environment

3.3.1 Soils

Soils are thin and shallow across the Site with sections of exposed bedrock and/or boulders.

A separate geotechnical study should be completed to adequately address the engineering capabilities of the soil.

3.3.2 Vegetation

Rare plants have the potential to occur onsite. The diverse micro-habitats onsite, wetlands, watercourse, seeps, and rocky outcrops, are known to support rare species. Incidental rare species were not observed during the Site visit; but as a rare plant survey was not conducted, rare plants may be present.

Invasive plants were identified onsite, most notably in the disturbed areas, and have the potential to spread throughout the Site and onto adjacent properties.

3.3.3 Wildlife & Wildlife Habitat

Veteran trees and wildlife trees should be conserved where possible. Retain coarse woody debris on Site, and any trees that are felled should be added to the forest system to be retained as new coarse woody debris. Nest boxes and bat boxes may be created to supplement functionality lost to development.

Suitable coastal tailed frog habitat exists within Gebhardt Creek. As Gebhardt Creek is protected by RAR and RMOW development constraints, the coastal tailed frog habitat is adequately protected, as long as changes to flows, riparian zone and instream features are not altered.

3.3.4 Valued/Sensitive Ecosystem

Rocky outcrops are unique ecosystems that have the potential to support rare and endangered species were identified at the Site. However, a detailed rare and endangered plant survey should be completed prior to development.

Micro-habitats resulting from altered or varied hydrology, including seeps, the wetland/pool and areas of saturated soils, have the potential to support rare and endangered species. A detailed rare and endangered plant species should be completed prior to development.

3.4 Aquatic Environment

Any works proposed within 30m of Gebhardt Creek or Nita Lake will require a Riparian Areas Regulation (RAR) assessment by a Qualified Environmental Professional (QEP). The Squamish-Lillooet Regional District (SLRD) (of which the RMOW is a member) has adopted RAR methodology under the Development Permit Areas of the Official Community Plans. A RAR assessment will define the appropriate Streamside Protection and Enhancement Area (SPEA) setback distances from the watercourses applicable to the Site.

The reaches of Gebhardt Creek are considered non-fish bearing within the Site boundaries. However, the downstream reach in Polygon 8 is likely fish bearing, as is Nita Lake and downstream watercourses. Therefore, the onsite reaches of Gebhardt Creek must be treated as sensitive. The side channel, which frequently runs subsurface, should be investigated during a RAR survey to determine its source in the event that future development of the north end of the property is considered. It should be noted that the original IER conducted in 2000 was pre-RAR enactment, which occurred in 2004. Therefore, the recommendations related to riparian areas have evolved since the original IER.

The presence of fish in the pool in Polygon 4 is a constraint on the development of the Valley Trail, and, potentially, on the recontoured slopes under the townhouse units at the southeast end of the Site. A RAR assessment to establish a SPEA is recommended.

The seepages and runoff areas should be maintained or managed through storm water management planning to facilitate seasonal run-off, and to prevent flooding or water impoundment.

SPEA setbacks from Nita Lake should be established and applied to any development. Trail building within 30m of the Lake or within the SPEA should be included in the RAR assessment. While the CN Rail tracks provide a permanent separation between Nita Lake and the Site, the integrity of the riparian area including vegetation west of the tracks is important for food resources and shade on the lake.

3.5 Socio-Economic Conditions

3.5.1 Cultural and Heritage Resources

The Cascade 2000 IER has suggested that any development at the Site should consider preservation of the existing cabin and shed. No other cultural or heritage resources were observed at the Site. However, a Preliminary Field Reconnaissance was not undertaken for this report. It is recommended that prior to development at the Site, a Preliminary Field Reconnaissance be conducted by a qualified professional.

3.5.2 Other Undertakings in The Area

Coordination with other developments in the area, including the housing development to the south, will require traffic management plans, and may limit the available work hours to manage noise. R.F. Binnie & Associates Ltd. prepared a *Preliminary Servicing Report* (R.F. Binnie 2018) which states that *"a traffic study may be required to confirm the implications of development. It can be expected in any case that road geometry will conform to both TAC design guidelines and RMOW standards".* Development constraints due to the proximity of the CN Rail tracks and the BC Hydro ROW should also be considered.

4.0 RECOMMENDATIONS AND CONCLUSIONS

PGL conducted an Initial Environmental Review Update to identify environmental attributes that the future development of the Site should consider. The IER was a broad survey of potential constraints and environmental features. Species specific studies would be required to determine the presence of at risk animals and plants at the Site.

Based on our site observations, the Cascade 2000 IER conclusions and recommendations were appropriate for the Site and should be reviewed and incorporated into development planning (Appendix 1). The main development constraints to the Site include the BC Hydro ROW, CN Rail tracks and ROW, RMOW hydrography and environmental setbacks, RAR SPEA setbacks, and the preservation of veteran trees. Habitat with the potential to support rare plants includes seeps, rocky bluffs, and the wetland.

Three key categories for environmental due diligence have been identified, which summarize our recommendations and those of Cascade (2000); mitigation, pre-planning and sensitive areas. The categories and recommended due diligence are as follows:

Mitigation:

- Presence of invasive plants along the access road should be identified and mapped by a QEP to produce an Invasive Plant Management Plan for the Site. Noxious weeds are the responsibility of the land operator under the provincial *Weed Act*;
- Clearing activities should be conducted within appropriate breeding-bird least-risk timing windows, if possible. If clearing can not be completed during the least-risk windows, a qualified environmental professional should be retained to conduct pre-clearing nest surveys. The least risk windows are September 1 to February 28 for passerines, and October 1 to December 31 for eagles, herons and raptors (inclusive);
- Habitat potentially suitable for the provincially Blue-listed (and federal Species of Concern) northern red-legged frog and western toad (Yellow-listed) was observed in Polygon 4. Future development should consider current-day BMPs, which may include salvage operations immediately prior to site clearing or filling activities in the potential area identified in Figure 2. Aquatic amphibian salvage should be conducted between March 2 and September 31 to avoid risk of mortality to amphibians that are overwintering; and,
- Habitat suitable for the Coastal tailed frog (federally listed as a species of Special Concern) was observed in Polygon 1 in Gebhardt Creek. Future development should include a review of current-day BMPs which may include species specific surveys in the potential areas identified in Figure 2. Current development plans are not expected to impact Coastal tailed frog habitat.

Pre-Planning:

- Invasive plant species were observed along the access road and adjacent areas, and the CN Rail track. Invasive species should be managed accordingly during pre-development, including the preparation of an Invasive Plant Management Plan;
- A geotechnical survey of the proposed development areas should be conducted by a qualified professional;
- A Preliminary Field Reconnaissance should be completed to assess the potential for archaeological resources protected under the *Heritage Conservation Act*;
- A Riparian Areas Regulation assessment of watercourses on the Site should be completed by a QEP to determine Streamside Protection and Enhancement Area setbacks and the applicability of the diverted side channel and pool;
- A raptor nest survey should be conducted to determine the presence of any raptor nests on Site prior to development; and

- Preparation of a Construction Environmental Management Plan to identify BMPs, construction specific mitigation, erosion and sediment control plan, monitoring requirements and emergency plans.

Sensitive Areas:

- Veteran trees and danger trees should be surveyed by a professional arborist to determine individuals for preservation and potential hazard trees and map locations;
- Fish sampling in the pool in Polygon 4 should be conducted to determine the species presence and population of the fish in the pool, and an assessment of the water connection to Nita Lake is recommended to determine sensitivities and constraints to development near the Polygon 4; and
- Seeps, rocky outcrops, and the wetland should be surveyed for rare and endangered plants for the purpose of determining rare plant presence and suitability for salvage and transplant.

5.0 LIMITATIONS

PGL prepared this report for our client and its agents exclusively. PGL accepts no responsibility for any damages that may be suffered by third parties as a result of decisions or actions based on this report.

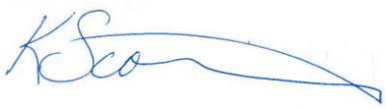
The findings and conclusions are site-specific and were developed in a manner consistent with that level of care and skill normally exercised by environmental professionals currently practicing under similar conditions in the area. Changing assessment techniques, regulations, and site conditions means that environmental investigations and their conclusions can quickly become dated, so this report is for use now. The report should not be used after that without PGL review/approval.

The project has been conducted according to our instructions and work program. Additional conditions, and limitations on our liability are set forth in our work program/contract. No warranty, expressed or implied, is made.

Respectfully submitted,

PGL ENVIRONMENTAL CONSULTANTS

Per:



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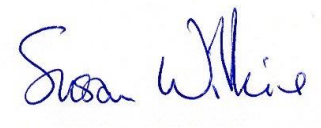

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6.0 REFERENCES

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Figures

PGL
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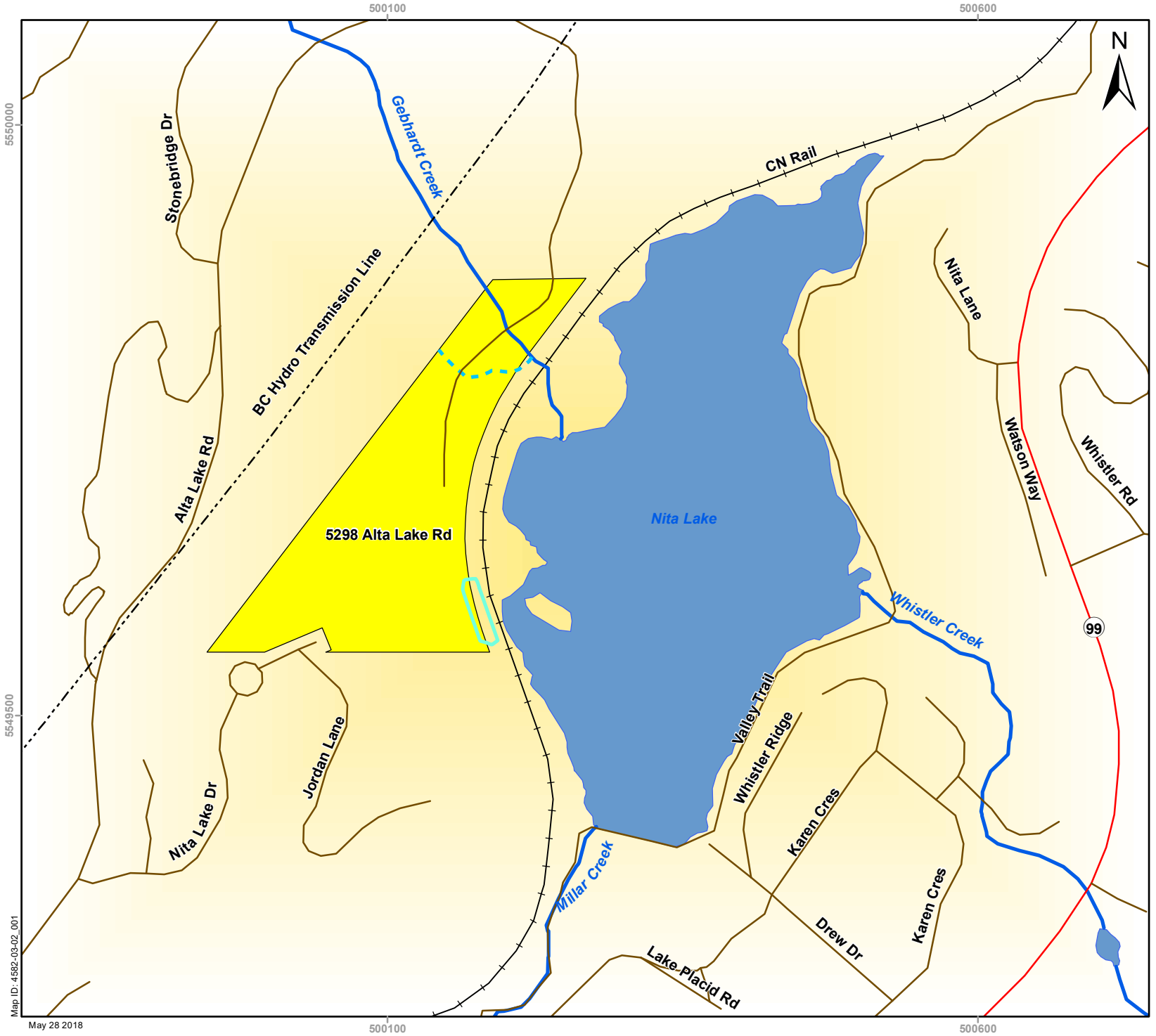


Site Location

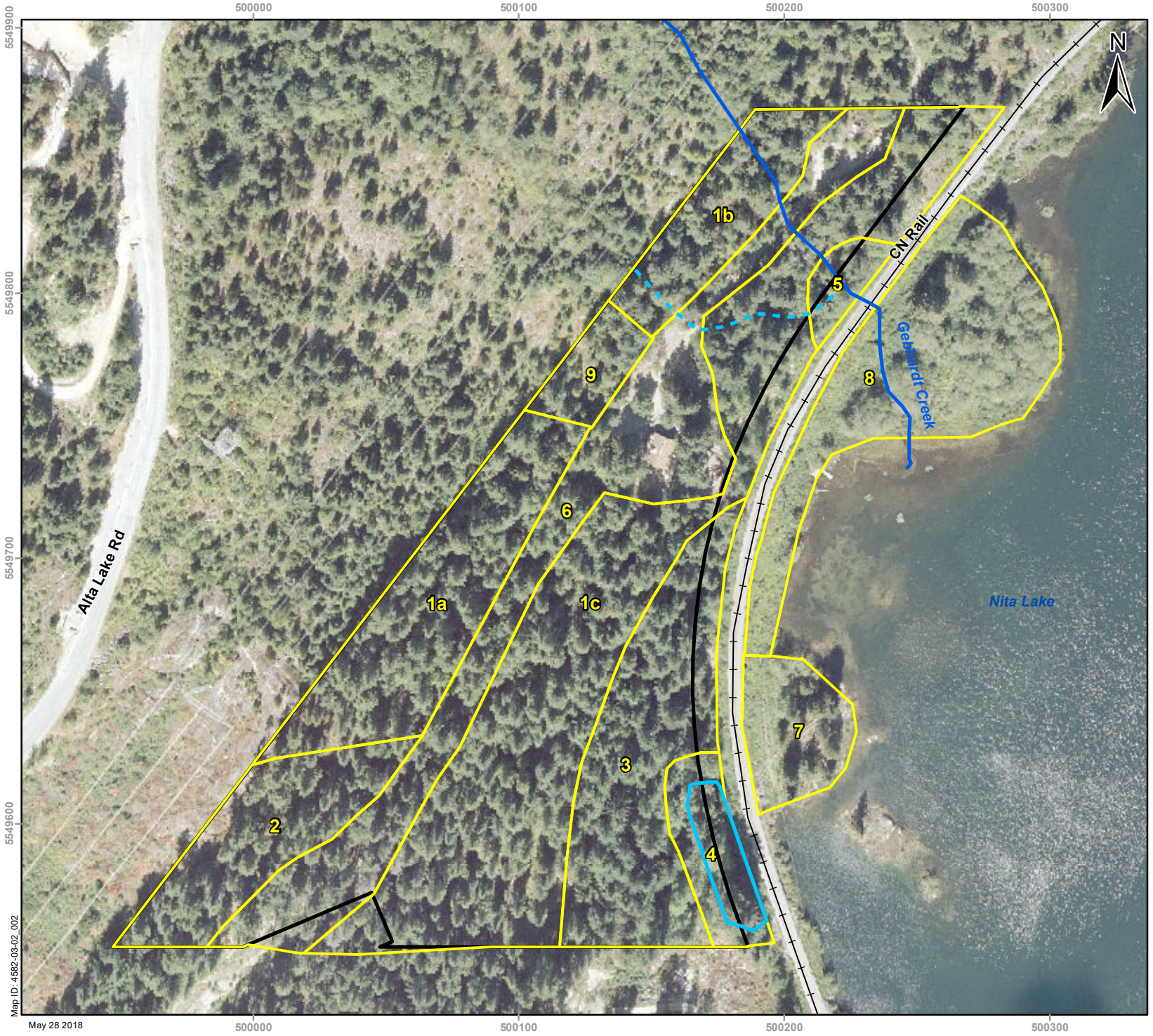
- Creek
- Side Channel
- Lake
- Pool
- 5298 Alta Lake Rd
- Transmission Line
- Railway

1:4,500
0 50 100
Metres

Coordinate System: NAD 1983 UTM Zone 10N

PGL ENVIRONMENTAL CONSULTANTS

Figure 1



Existing Environmental Conditions

- Creek
- Side Channel
- Pool
- 5298 Alta Lake Rd
- Vegetation Associations

Polygon 1 – Upland Slopes
Polygon 2 – Steep and Cool Upper Slope
Polygon 3 – Lowland Slope
Polygon 4 – Pool
Polygon 5 – Lower Reach Gebhardt Creek
Polygon 6 – Anthropogenic/ Disturbance Areas
Polygon 7 – Rock Outcrop
Polygon 8 – Gebhardt Creek Fan
Polygon 9 – Adjacent BC Hydro Line

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Metres

Coordinate System: NAD 1983 UTM Zone 10N

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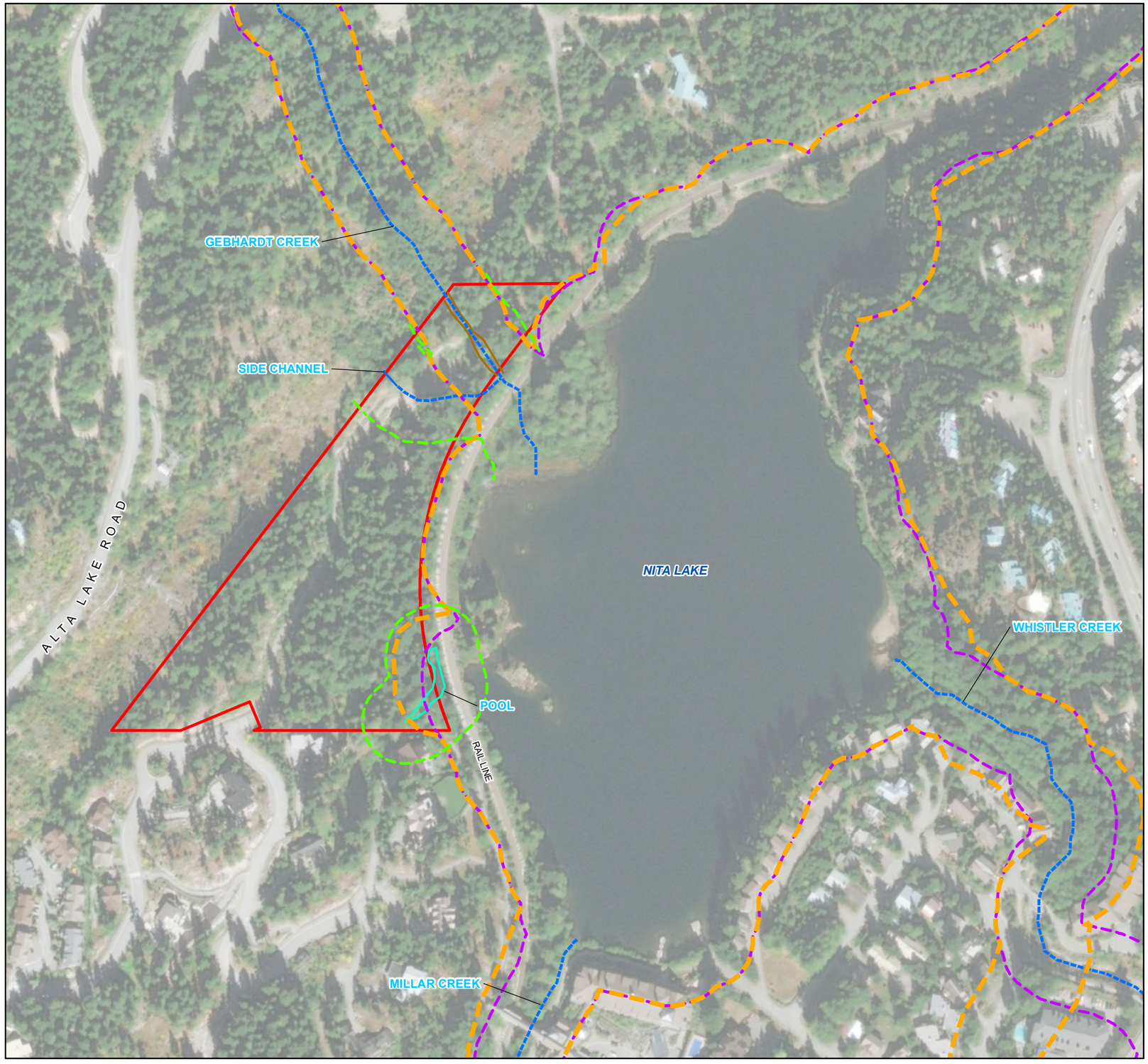
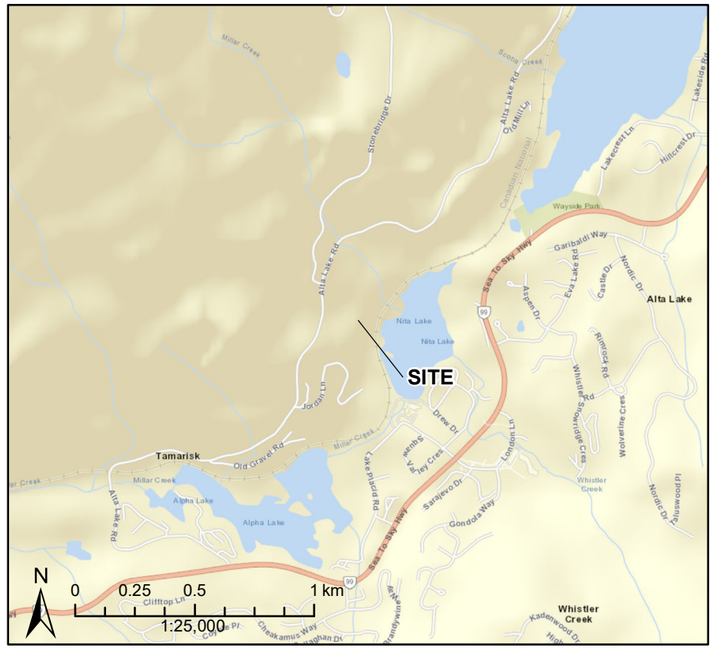
Figure 2





- Site Boundary (Approximate)
- Watercourse Centreline (Surveyed)
- Watercourse Centreline (Approximate)
- Pool (Surveyed)
- Watercourse Natural Boundary (Surveyed)
- Recommended Riparian Assessment Area (30m)
- RMOW 30m Hydrography Buffer (Approximate)
- RMOW 30m Riparian Buffer (Approximate)

N
0 60 120 m
1:3,000
Approximate Scale
NAD 1983 UTM Zone 10N

Image: *Google Earth Pro* **Parcel:** *Open DataBC*

ENVIRONMENTAL SENSITIVITY AND DEVELOPMENT CONSTRAINTS

5298 Alta Lake Road, Whistler, BC

BETHEL LANDS CORPORATION

PGL ENVIRONMENTAL CONSULTANTS	File No.:	Date:	Dwg No.:	Drawn by:	FIGURE
	4582-03.02	OCT 2018	45820302-F31	DPL	3

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Tables

PGL ENVIRONMENTAL CONSULTANTS

Table 1
Animal Species at Risk Potentially Occuring Onsite
Various Locations: 5298 Alta Lake Road, Whistler, PGL File 4582-03.02

Scientific Name	English Name	COSEWIC[1]	BC Status[1]	SARA[1]	Habitat Requirements
Amphibians					
Anaxyrus boreas	Western Toad	Special Concern	Yellow	1-SC	Bog;Fen;Swamp;Marsh;Riparian Forest;Riparian Shrub;Stream/River;Lake;Meadow;Grassland;Deciduous/Broadleaf Forest;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Pond/Open Water;Riparian Herbaceous;Warm Spring;Gravel Bar
Ascaphus truei	Coastal Tailed Frog	Special Concern	Yellow	1-SC	Riparian Forest;Stream/River;Meadow;Alpine/Subalpine Meadow
Rana aurora	Northern Red-legged Frog	Special Concern	Blue	1-SC	Bog;Fen;Swamp;Marsh;Riparian Forest;Riparian Shrub;Stream/River;Lake;Meadow;Deciduous/Broadleaf Forest;Pond/Open Water;Riparian Herbaceous;Gravel Bar
Birds					
Accipiter gentilis laingi	Northern Goshawk, *laingi* subspecies	Threatened	Red	1-T	Estuary;Riparian Forest;Pasture/Old Field;Cultivated Field;Hedgerow;Meadow;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Krummholtz
Aeronautes saxatalis	White-throated Swift		Blue		Stream/River;Lake;Cliff;Rock/Sparsely Vegetated Rock;Talus
Ardea herodias fannini	Great Blue Heron, *fannini* subspecies	Special Concern	Blue	1-SC	Estuary;Swamp;Marsh;Vernal Pools/Seasonal Seeps;Riparian Forest;Lake;Pasture/Old Field;Cultivated Field;Hedgerow;Intertidal Marine;Meadow;Deciduous/Broadleaf Forest;Conifer Forest - Mesic (average);Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Marine Island;Beach;Urban/Suburban;Pond/Open Water;Reefs;Eelgrass Beds;Riparian Herbaceous;Mudflats - Intertidal;Sheltered Waters - Marine
Brachyramphus marmoratus	Marbled Murrelet	Threatened	Blue	1-T	Kelp Bed;Riparian Forest;Stream/River;Lake;Rock/Sparsely Vegetated Rock;Conifer Forest - Mesic (average);Conifer Forest - Moist/wet;Subtidal Marine;Sheltered Waters - Marine
Butorides virescens	Green Heron		Blue		Estuary;Swamp;Marsh;Riparian Forest;Riparian Shrub;Stream/River;Lake;Urban/Suburban;Pond/Open Water;Riparian Herbaceous
Chordeiles minor	Common Nighthawk	Threatened	Yellow	1-T	Bog;Fen;Swamp;Marsh;Stream/River;Lake;Pasture/Old Field;Cultivated Field;Hedgerow;Cliff;Rock/Sparsely Vegetated Rock;Talus;Meadow;Grassland;Sagebrush Steppe;Deciduous/Broadleaf Forest;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Urban/Suburban;Pond/Open Water;Antelope-brush Steppe;Gravel Bar
Coccothraustes vespertinus	Evening Grosbeak	Special Concern	Yellow		Riparian Forest;Deciduous/Broadleaf Forest;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Urban/Suburban
Contopus cooperi	Olive-sided Flycatcher	Threatened	Blue	1-T	Bog;Fen;Swamp;Riparian Forest;Conifer Forest - Mesic (average);Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Pond/Open Water
Cypseloides niger	Black Swift	Endangered	Blue		Bog;Fen;Swamp;Marsh;Stream/River;Lake;Cliff;Pond/Open Water
Euphagus carolinus	Rusty Blackbird	Special Concern	Blue	1-SC	Bog;Fen;Swamp;Marsh;Lake;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Urban/Suburban;Pond/Open Water;Industrial
Falco mexicanus	Prairie Falcon	Not a Risk	Red		Pasture/Old Field;Cultivated Field;Hedgerow;Cliff;Tundra;Meadow;Grassland;Sagebrush Steppe;Antelope-brush Steppe
Falco peregrinus anatum	Peregrine Falcon, *anatum* subspecies	Not a Risk	Red	1-SC	Bog;Fen;Swamp;Marsh;Alkali Ponds/Salt Flats;Stream/River;Lake;Pasture/Old Field;Cultivated Field;Hedgerow;Cliff;Rock/Sparsely Vegetated Rock;Talus;Meadow;Grassland;Shrub - Natural;Sagebrush Steppe;Beach;Urban/Suburban;Pond/Open Water;Riparian Herbaceous;Antelope-brush Steppe;Gravel Bar
Hirundo rustica	Barn Swallow	Threatened	Blue	1-T	Estuary;Bog;Fen;Swamp;Marsh;Riparian Forest;Riparian Shrub;Stream/River;Lake;Pasture/Old Field;Cultivated Field;Hedgerow;Meadow;Grassland;Shrub - Natural;Sagebrush Steppe;Deciduous/Broadleaf Forest;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Urban/Suburban;Pond/Open Water;Riparian Herbaceous;Antelope-brush Steppe;Gravel Bar;Shrub - Logged;Industrial

Table 1
Animal Species at Risk Potentially Occuring Onsite
Various Locations: 5298 Alta Lake Road, Whistler, PGL File 4582-03.02

Scientific Name	English Name	COSEWIC[1]	BC Status[1]	SARA[1]	Habitat Requirements
Megascops kennicottii kennicottii	Western Screech-Owl, *kennicottii* subspecies	Threatened	Blue	1-T	Riparian Forest;Pasture/Old Field;Hedgerow;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Urban/Suburban
Melanerpes lewis	Lewis's Woodpecker	Threatened	Blue	1-T	Riparian Forest;Pasture/Old Field;Cultivated Field;Hedgerow;Meadow;Grassland;Sagebrush Steppe;Deciduous/Broadleaf Forest;Conifer Forest - Dry;Urban/Suburban;Antelope-brush Steppe
Numenius americanus	Long-billed Curlew	Special Concern	Blue	1-SC	Pasture/Old Field;Cultivated Field;Intertidal Marine;Meadow;Grassland;Mudflats - Intertidal
Patagioenas fasciata	Band-tailed Pigeon	Special Concern	Blue	1-SC	Riparian Forest;Pasture/Old Field;Cultivated Field;Deciduous/Broadleaf Forest;Conifer Forest - Mesic (average);Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Hot Spring;Urban/Suburban;Warm Spring;Cold Spring
Podiceps nigricollis	Eared Grebe		Blue		Estuary;Bog;Fen;Swamp;Marsh;Lake;Sheltered Waters - Marine
Strix occidentalis	Spotted Owl	Endangered	Red	1-E	Riparian Forest;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet
Bivalves					
Sphaerium striatinum	Striated Fingernailclam		Blue		
Gastropods					
Galba bulimoides	Prairie Fossaria		Blue		
Galba dalli	Dusky Fossaria		Blue		
Gyraulus crista	Star Gyro		Blue		
Physella propinqua	Rocky Mountain Physa		Blue		
Physella virginea	Sunset Physa		Blue		
Insects					
Argia emma	Emma's Dancer		Blue		Riparian Shrub;Stream/River;Lake;Pond/Open Water;Riparian Herbaceous
Argia vivida	Vivid Dancer	Special Concern	Blue		Stream/River;Hot Spring;Warm Spring;Cold Spring
Callophrys eryphon sheltonensis	Western Pine Elfin, *sheltonensis* subspecies		Blue		Bog;Shrub - Natural;Krummholtz
Cicindela hirticollis	Hairy-necked Tiger Beetle		Blue		Beach
Danaus plexippus	Monarch	Endangered	Blue	1-SC	Pasture/Old Field;Cultivated Field;Hedgerow;Meadow;Grassland;Sagebrush Steppe;Urban/Suburban
Enallagma clausum	Alkali Bluet		Blue		Alkali Ponds/Salt Flats;Pond/Open Water
Erynnis propertius	Propertius Duskywing		Red		Meadow;Mixed Forest (deciduous/coniferous mix);Garry Oak Woodland
Euphyes vestris	Dun Skipper	Threatened	Red	1-T	Vernal Pools/Seasonal Seeps;Meadow
Ophiogomphus occidentis	Sinuous Snaketail		Blue		Stream/River;Lake
Parnassius clodius claudianus	Clodius Parnassian, *claudianus* subspecies		Blue		
Parnassius clodius pseudogallatinus	Clodius Parnassian, *pseudogallatinus* supspecies		Blue		

Table 1
Animal Species at Risk Potentially Occuring Onsite
Various Locations: 5298 Alta Lake Road, Whistler, PGL File 4582-03.02

Scientific Name	English Name	COSEWIC[1]	BC Status[1]	SARA[1]	Habitat Requirements
Mammals					
Gulo gulo	Wolverine	Special Concern	No Status		
Gulo gulo luscus	Wolverine, *luscus* subspecies	Special Concern	Blue		Bog;Fen;Swamp;Marsh;Riparian Forest;Stream/River;Cliff;Rock/Sparsely Vegetated Rock;Talus;Avalanche Track;Meadow;Grassland;Shrub - Natural;Deciduous/Broadleaf Forest;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Krummholtz;Alpine/Subalpine Meadow;Alpine Grassland
Myotis keenii	Keen's Myotis	Data Deficient	Blue	3	Riparian Forest;Caves;Cliff;Rock/Sparsely Vegetated Rock;Talus;Conifer Forest - Mesic (average);Conifer Forest - Moist/wet;Hot Spring;Urban/Suburban;Industrial
Myotis lucifugus	Little Brown Myotis	Endangered	Yellow	1-E	Riparian Forest;Riparian Shrub;Caves;Meadow;Grassland;Shrub - Natural;Deciduous/Broadleaf Forest;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Urban/Suburban;Shrub - Logged;Industrial;Garry Oak Woodland;Garry Oak Coastal Bluffs
Oreamnos americanus	Mountain Goat		Blue		Cliff;Rock/Sparsely Vegetated Rock;Talus;Tundra;Avalanche Track;Meadow;Grassland;Shrub - Natural;Sagebrush Steppe;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Krummholtz;Alpine/Subalpine Meadow;Alpine Grassland
Pekania pennanti	Fisher		Blue		Bog;Fen;Swamp;Marsh;Riparian Forest;Riparian Shrub;Deciduous/Broadleaf Forest;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Krummholtz;Riparian Herbaceous;Gravel Bar
Sorex bendirii	Pacific Water Shrew	Endangered	Red	1-E	Estuary;Bog;Fen;Swamp;Marsh;Riparian Forest;Riparian Shrub;Stream/River;Conifer Forest - Moist/wet;Riparian Herbaceous;Gravel Bar
Ursus arctos	Grizzly Bear	Special Concern	Blue		Estuary;Bog;Fen;Swamp;Marsh;Riparian Forest;Riparian Shrub;Stream/River;Caves;Pasture/Old Field;Talus;Tundra;Avalanche Track;Meadow;Grassland;Sagebrush Steppe;Deciduous/Broadleaf Forest;Conifer Forest - Mesic (average);Conifer Forest - Dry;Conifer Forest - Moist/wet;Mixed Forest (deciduous/coniferous mix);Beach;Urban/Suburban;Riparian Herbaceous;Gravel Bar
Fish					
Acipenser medirostris	Green Sturgeon	Special Concern	Red	1-SC	Kelp Bed;Intertidal Marine;Subtidal Marine;Marine Island;Reefs;Eelgrass Beds;Sheltered Waters - Marine;Pelagic
Acipenser transmontanus	White Sturgeon	Endangered	No Status	1-E	Estuary;Kelp Bed;Stream/River;Lake;Intertidal Marine;Subtidal Marine;Marine Island;Pond/Open Water;Reefs;Eelgrass Beds;Sheltered Waters - Marine;Pelagic
Oncorhynchus clarkii clarkii	Cutthroat Trout, *clarkii* subspecies		Blue		
Salvelinus confluentus	Bull Trout	Special Concern	Blue		
Reptile					
Charina bottae	Northern Rubber Boa	Special Concern	Yellow	1-SC	Riparian Forest;Stream/River;Sub-soil;Rock/Sparsely Vegetated Rock;Talus;Meadow;Grassland;Sagebrush Steppe;Conifer Forest - Mesic (average);Conifer Forest - Dry;Mixed Forest (deciduous/coniferous mix);Antelope-brush Steppe
Contia tenuis	Sharp-tailed Snake	Endangered	Red	1-E	Caves;Sub-soil;Rock/Sparsely Vegetated Rock;Talus;Meadow;Conifer Forest - Dry;Garry Oak Coastal Bluffs
Pituophis catenifer	Gopher Snake		No Status	1-XX/T	

Citation: B.C. Conservation Data Centre. 2018. BC Species and
Search Criteria: Regional District: Squamish Lillooet Regional District (SLRD), BEC Zone: CWH
[1] See Appendix 1 for definitions and status descriptions.
Species considered unlikely to occur at the Site.

Table 2
Plant Species at Risk Potentially Occurring Onsite
5298 Alta Lake Road, Whistler, PGL File 4582-03.02

Scientific Name	English Name	COSEWIC[1]	BC Status[1]	SARA[1]	BEC	Habitat Requirements
Nonvascular						
Brachythecium holzingeri			Blue		CWH	Insufficient Information
Brotherella roellii	Roell's brotherella	Endangered	Red		CWH	Insufficient Information
Bryum schleicheri			Blue		CWH	Insufficient Information
Callicladium haldanianum			Blue		CWH	Insufficient Information
Claopodium pellucinerve			Red		CWH	Insufficient Information
Diphyscium foliosum			Blue		CWH	Insufficient Information
Funaria muhlenbergii			Blue		CWH	Insufficient Information
Grimmia anomala			Blue		CWH;MH	Insufficient Information
Hygrohypnum alpinum			Blue		CWH	Insufficient Information
Pohlia cardotii			Blue		CWH	Insufficient Information
Pohlia elongata			Blue		CWH	Insufficient Information
Sphagnum contortum			Blue		CWH	Insufficient Information
Tripterocladium leucocladulum			Blue		CWH	Insufficient Information
Vascular						
Bidens amplissima	Vancouver Island beggarticks	Special Concern	Blue	1-SC	CWHms	Shoreline of marshes, wet meadows, bogs, ditches, stream banks, lake margins and tidal zones of the Fraser River.
Pinus albicaulis	whitebark pine	Endangered	Blue	1-E	CWHms	Mesic to dry slopes in the subalpine to alpine zones
Stellaria obtusa	blunt-sepaled starwort		Blue		CWHms	Wet to moist meadows and streambanks in the montane zone

Citation: B.C. Conservation Data Centre. 2018. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, B.C. Available: http://a100.gov.bc.ca/pub/eswp/ (accessed May 2, 2018).
Search Criteria: Regional District: Squamish Lillooet Regional District (SLRD), BEC Zone: CWHms
[1] See Appendix 3 for definitions and status descriptions.
Species considered unlikely to occur at the Site.

Table 3
Ecosystems at Risk Potentially Occurring Onsite
5298 Alta Lake Road, Whistler, PGL File 4582-03.02

Scientific Name	English Name	BC List[1]	Biogeoclimatic Units	Ecosystem Group
Abies amabilis - Thuja plicata / Gymnocarpium dryopteris	amabilis fir - western redcedar / oak fern	Blue	CWHms1/04;	Terrestrial Realm - Forest: Coniferous - mesic
Abies amabilis - Thuja plicata / Oplopanax horridus Moist Submaritime	amabilis fir - western redcedar / devil's club Moist Submaritime	Blue	CWHms1/06	Terrestrial Realm - Forest: Coniferous - moist/wet
Picea sitchensis / Rubus spectabilis Moist Submaritime	Sitka spruce / salmonberry Moist Submaritime	Red	CWHms1/07	Terrestrial Realm - Flood Group (F): Highbench Flood;Terrestrial Realm - Forest: Mixed - moist/wet
Pinus contorta / Sphagnum spp.	lodgepole pine / peat-mosses	Yellow	CWHms1/10	Wetland Realm - Peatland Group: Bog Wetland Class (Wb)
Populus trichocarpa - Alnus rubra / Rubus spectabilis	black cottonwood - red alder / salmonberry	Blue	CWHms1/08	Terrestrial Realm - Flood Group (F): Middle Bench Flood Class (Fm);Terrestrial Realm - Forest: Broadleaf - moist/wet
Populus trichocarpa / Salix sitchensis - Rubus parviflorus	black cottonwood / Sitka willow - thimbleberry	Red	CWHms1/09	Terrestrial Realm - Flood Group (F): Middle Bench Flood Class (Fm);Terrestrial Realm - Forest: Broadleaf - moist/wet
Pseudotsuga menziesii - Pinus contorta / Arctostaphylos uva-ursi Moist Submaritime	Douglas-fir - lodgepole pine / kinnikinnick Moist Submaritime	Blue	CWHms1/02	Terrestrial Realm - Forest: Coniferous - dry
Pseudotsuga menziesii - Tsuga heterophylla / Paxistima myrsinites	Douglas-fir - western hemlock / falsebox	Blue	CWHms1/03	Terrestrial Realm - Forest: Coniferous - dry
Thuja plicata - Picea sitchensis / Lysichiton americanus	western redcedar - Sitka spruce / skunk cabbage	Blue	CWHms1/11	Terrestrial Realm - Forest: Coniferous - moist/wet;Wetland Realm - Mineral Wetland Group: Swamp Wetland Class (Ws)
Tsuga heterophylla - Abies amabilis / Clintonia uniflora	western hemlock - amabilis fir / queen's cup	Yellow	CWHms1/05	Terrestrial Realm - Forest: Coniferous - moist/wet
Tsuga heterophylla - Abies amabilis / Hylocomium splendens	western hemlock - amabilis fir / step moss	Blue	CWHms1/01	Terrestrial Realm - Forest: Coniferous - mesic

Citation: B.C. Conservation Data Centre. 2018. BC Species and Ecosystems Explorer. B.C. Minist. of Environ. Victoria, B.C. Available: http://a100.gov.bc.ca/pub/eswp/ (accessed May 2, 2018).
Search Criteria: Regional District: Squamish Lillooet Regional District (SLRD), BEC Zone: CWHms1
[1] See Appendix 3 for definitions and status descriptions.

Appendix 1

Cascade 2000 Initial Environmental Review for London Mountain Lodge

PGL
ENVIRONMENTAL CONSULTANTS

Initial Environmental Review For London Mountain Lodge

FINAL

Prepared for:

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Prepared by:

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File 137-01-01

April 14, 2000

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Maps and Tables

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This Document should not be construed to be:

- ◊ A Phase 1 - Environmental Site Assessment;
- ◊ A Stage 1 – Preliminary Site Investigation (as per the Contaminated Sites Regulations of the Waste Mgt. Act); nor shall it be construed to be
- ◊ An Environmental Impact Assessment.

1.0 INTRODUCTION

1.1 Background

Private owner Ross Depner, proposes to establish a small rustic tourist facility to be called London Mountain Lodge along the northwest corner of Nita Lake, on DL2246, Group 1, Lot B, Reference Plan 2643. The facility would incorporate a combined lodge and spa, a number of small log cabins, including two preserved, existing buildings.

Cascade Environmental Resource Group Ltd. has been retained to conduct an Initial Environmental Review of the subject site. The review includes an assessment of the existing environmental and heritage conditions at the Nita Lake site, the identification and delineation of environmentally sensitive areas and ecologically significant habitats on the subject site, and any potential environmental constraints to development.

1.2 The Project Team

The project team consisted of Mike Nelson, R.P.Bio., Dave Williamson, B.E.S., Sharleen Hamm, Dipl. Tech., and Linda Dupuis, M.Sc., R.P. Bio. All project team members have extensive experience in conducting environmental inventories, reviews and assessments.

1.3 Methodology

Terrestrial ecosystem mapping (TEM) principles (Resources Inventory Committee, 1995) were employed to identify and delineate ecosystems units, and show their distribution within the study area. Terrestrial ecosystem mapping integrates physical features and biotic components to provide an ecological framework for land use and resource management.

Mike Nelson and Dave Williamson conducted a cursory ecological survey on March 3rd, 2000. Ecosystem Ground Inspection Forms were used to collect and record information to describe the site vegetation, mensuration/wildlife, soils, geomorphology, etc. in each polygon of the study area. Stream data was collected using standard DFO/MOE Stream Survey Forms (QP#19289). Sharleen Hamm conducted a GPS survey to determine potential road alignments. Linda Dupuis provided wildlife information, inferred from available habitats, local information and known distributions.

In addition, Dave Williamson conducted a review of the available heritage information relating to past use of the subject site.

1.4 Project Components

The subject property is located roughly 3 km south of Whistler Village, on the northwest shore of Nita Lake. Nita Lake is south of Alta Lake and north of Alpha Lake, west of the Sea to Sky Highway.

The site has a total area of 9.8 acres. It is bound to the west by two B.C. Hydro power lines and to the east by a BCR Rail line, which runs along the shore of Nita Lake. The subject area is composed of a mix of mature forest with veteran's, young second growth forest and shrub communities along the water's edge of Nita Lake.

Development will be distributed throughout the parcel, and access through the site will be via a narrow winding drive. Currently there are two buildings on the subject property; the Gebhardt house and a storage shed. A new lodge is proposed to be located near these existing structures and would be designed in a manner that would compliment the heritage values of the site.

2.0 EXISTING ENVIRONMENTAL CONDITIONS

2.1 Cultural Environment

2.1.1 Heritage Features

The subject property was originally owned by the Pacific Great Eastern Railway. In 1937 the property was sold to long time resident, Elizabeth Gebhardt. The Gebhardt's built the Rainbow Mill in 1926 and operated it adjacent to Twenty-one Mile Creek. The Gebhardts later moved the mill to a new site on the southwest side of Alta Lake. As a result of a clerical error in the title transfer the Gebhardts did not acquire the lands between the rail line and Nita Lake. Although Betty Gebhardt maintained a garden on the delta (Unit 8, Existing Environmental Conditions Map), the lands remained the property of PGE and finally BCRail until the title was transferred to the RMOW as parkland in 1999.

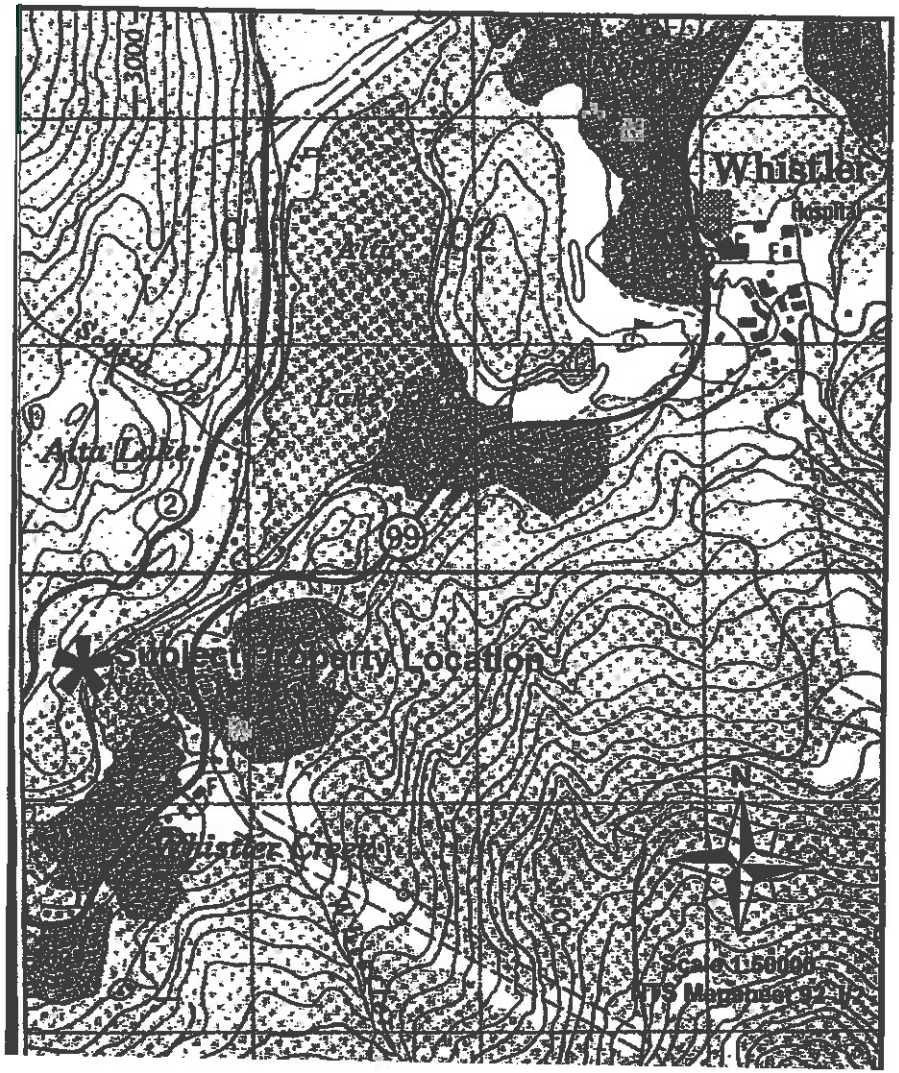
Two buildings remain on the site; the main house, and a small shed. Both structures, are rustic in style and are in fair condition.

2.2 Physical Environment

2.2.1 Climate

The study area lies within the Eastern Pacific Ranges Ecosection, within the Coast and Mountains Ecoprovince in southern British Columbia (Demarchi, 1996). The climate is principally influenced by frontal systems moving in from the Pacific Ocean and over the Coast Mountains to the Interior. This transitional climate is characteristically moist and cool in the winter and associated with heavy snowfall at higher elevation (Green and Klinka, 1994). Summers are relatively cool, although hot dry spells are frequent. Mean annual precipitation for the Whistler valley is 800.6mm rainfall, and 657.4cm snowfall (Alta Lake, 1951 to 1980 Climate Normals, Environment Canada, 1981).

Map 1 Location Map



2.2.2 Geology

The subject site contains the Gambier Group of the Mesozoic era. These stratified rock formations are composed of andesitic to dalcitic tuff, breccia agglomerate, andesite, argillite, conglomerate, lesser marble, greenstone and phyllite (Minfile 092J, 1993).

2.2.3 Geomorphology

The surficial character of the subject area is controlled by prominent rock outcroppings. Because of the dominance of bedrock, topography is variable, consisting of slightly to moderately steep terrain with bedrock benches.

2.2.4 Hydrology

2.2.4.1 Creeks and Lakes

An 80m section of Gebhardt Creek flows west to east in a bedrock controlled ravine within the subject site. The creek is bridged on the subject site, flows through two 1m by 0.6m oval culverts under the BC Rail line (the eastern boundary of the subject property), and then flows approximately 70m further east to its mouth on Nita Lake. Downstream of the BC Rail line, the creek is braided on a delta. Flows on March 13, 2000 were estimated at 0.02 m^3/s, however, the bedrock and bouldery nature of the creek bed within the subject property indicate that higher flows can be expected.

A portion of Gebhardt Creek has also been diverted into a draw to form a water feature on the subject site. During the March 2000 site visit, flows in this channel were estimated at 2 l/s. The flow ran subsurface downstream of the site access road.

Three intermittent seepages are also located within the subject property. These drainages likely flow only during periods of snow melt in the immediate area, or during extreme storm events.

Nita Lake and the small wetlands along the lake's shoreline, are located east of the subject property an area separated from the site by the BC Rail line.

2.2.4.2 Floodplains

Within its delta downstream of the BC Rail line, Gebhardt Creek is unconfined with a braided channel. Any part of the delta is likely to be inundated during a large storm event. Upstream of the BC Rail line, within the subject property, the creek is confined in a ravine.

Nita Lake is separated from the site by the BC Rail line. Due to the upland nature of the subject site, flooding does not appear to be a concern.

2.3 Terrestrial Environment

2.3.1 Soils

Soils are thin and irregularly distributed over the subject site. During a survey of the Alta Lake Area, Luttmerding (1971) identified the soils as Lithic Orthic Humo-Ferric Podzols and Orthic Humo-Ferric Podzols.

2.3.2 Vegetation

2.3.2.1 Biogeoclimatic Zone Classification (CWH ms1)

The subject site is part of the Moist Submaritime (ms) Coastal Western Hemlock (CWH) Southern (1) Variant (Green & Klinka, 1994). This biogeoclimatic zone occurs in submaritime areas of the Coast Mountains at elevations ranging from 650 to 1,350 m. Within this biogeoclimatic subzone, a number of different site series were identified. The site series classification reflects subtle changes in microclimate, and soil conditions which reflect on the species composition within the unit. The different site series are further classified into Terrestrial Ecosystem Units based on the structural stage of the vegetation and the geomorphology of the site. The Terrestrial Ecosystem Units found on the subject site are described in the following section of this report and are mapped in Existing Environmental Conditions Map 2.

Table 1 Areal Relationship of Vegetation Units

TEM Unit Poly #	Area (m^2)	Site Series	Structural Stage	Site Modifiers	TEM Code
1	24962	03	Mature Forest	hs	DFhs6
2	1587	01	Mature Forest	ks	AMks6
3	9725	01	Young Forest	c	AM5
4	948	08	Young Deciduous Forest	c	CDc5
5	560	08	Young Deciduous Forest	c	CDc5
6	1857	03	Herb/Denuded Area		UR
7	1606	03	Mature Forest	b	DFb6
8	5681	09	Sapling Pole Forest		CW4
Total	46926				

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Map 2 Existing Environmental Conditions

2.3.2.2 Vegetation Associations

Map Polygon 1

DFhx6

The mature forest occupying the uplands of the subject site is characterized by western hemlock (*Tsuga heterophylla*), and Douglas-fir (*Pseudotsuga menziesii*), with occasional western redcedar (*Thuja plicata*), amabilis fir (*Abies amabilis*), yellow cedar (*Chamaecyparis nootkatensis*), red alder (*Alnus rubra*), northern black cottonwood (*Populus balsamifera ssp. tricocarpa*) and yew (*Taxus brevifolia*). Tree species diversity can be attributed to 4 very small intermittent drainage channels running through the property. Crown closure of the forest canopy is approximately 50%. The site is hummocky (h) with shallow soils (s). A number of veteran Douglas-fir and western hemlock ranging in age to 250-300 years and 45-60 cm DBH are also present within this unit.

Map Polygon 2

AMks6

This mature forest unit is characterized by western hemlock, western redcedar and Douglas-fir. The site is located on a significant slope with a cool aspect (k) and has shallow soils (s).

Map Polygon 3

AM5

The lower slopes appear to be more extensively cut than the upland forest unit. This young forest is characterized by the same tree species as Ecosystem Unit 1. A core sample taken from a Douglas-fir of 45 cm DBH yielded an age estimate of approximately 80 years.

Map Polygon 4

CDc5

This unit is a small receiving area from two of the aforementioned intermittent drainage channels. Construction of the rail line in or about 1914 impeded the outflow of the drainages and created a small wetland feature. The young forest is primarily composed of red alder.

Map Polygon 5

CDc5

This small grove of red alder up to 40 cm DBH and 30+ years of age occupy the lower reach of Gebhardt Creek above the rail line.

Map Polygon 6

UR

This small polygon is described as urban/rural developed land and consists of the buildings and the driveway. Its primary cover is grassed lawn and gravel drive.

Map Polygon 7
DFb6
Terrestrial Ecosystem Unit 6 is a small bedrock outcropping that extends out into Nita Lake. Although it falls outside the subject site property it is described because of its connection between the upland subject property and Nita Lake. It is currently RMOW parkland. Tree cover is sparse with approximately 12 specimens of small but mature Douglas-fir, lodgepole pine (*Pinus contorta*) and western redcedar. Due to the very thin soils (b), the site tends to be xeric in spite of its close proximity to the lake.

Map Polygon 8
CW4
Polygon 8 comprises the delta of Gebhardt Creek and along with the foreshore east of the railway tracks constitutes a low bench floodplain. It is described as a sapling pole forest of red alders ranging from 12 – 15 m in height, although 7 western redcedars are present in the unit. The largest of the redcedars was measured at 134 cm DBH. Shrubs observed included red-osier dogwood (*Cornus stolinifera*), red elderberry (*Sambucus racemosa*), highbush cranberry (), goatsbeard (*Aruncus dioicus*), hardhack (*Spiraea douglasii*), and devil's club (*Oplopanax horridus*). Sedges (*Carex sp.*) were also observed through the snowpack near the water's edge.

2.4 Wildlife and Wildlife Habitats

2.4.1 Wildlife

The wildlife investigation was approached from a habitat perspective.

Birds
The small areas of shrub thickets provide an ecotone between the forested environment and the lake. As such, some bird species likely breed in the area including the resident song sparrow (*Melospiza melodia*) and spotted towhee (*Pipilo macularia*), and migratory breeders such as the Swainson's thrush (*Catharus minimus*), rufous hummingbird (Selasphorus rufous), Pacific-slope flycatcher (*Empidonax difficilis)*, warbling vireo (*Vireo gilvus*), Wilson's warbler (*Wilsonia pusilla*), yellow warbler (*Dendroica petechia*), orange-crowned warbler (*Vermivora celata*), common yellowthroat (*Geothlypis trichas*), the dark-eyed junco (*Junco hyemalis*), and American robin (*Turdus migratorius*).

Coniferous stands generally accommodate woodpecker species, the winter wren (*Troglodytes troglodytes*), chickadee species, the red-breased nuthatch (*Sitta canadensis*), the golden-crowned kinglet (*Regulus satrapa*) and the Steller's Jay (*Cyanocitta stelleri*) (Campbell et al., 1990a,b; Campbell et al., 1997; Ricker et al., 1996).

Amphibians and Reptiles

Due to the proximity of the site to the Nita Lake foreshore, one would expect terrestrially-bound individuals of the Pacific treefrog (*Hyla regilla*), boreal toad (*Bufo boreas*), northwestern salamander (*Ambystoma gracile*) and long-toed salamander (*Ambystoma macrodactylum*) (Green and Campbell, 1984). The aquatic red-legged frog (*Rana aurora*) may also occur in the area, during moist spells.

Two reptile species that frequent aquatic and edge habitats typical of the subject area are the northwestern garter snake (*Thamnophis ordinoides*) and common garter snake (*Thamnophis sirtalis*) (Gregory and Campbell, 1987).

Mammals

The site is separated from the contiguous upland forests by two power line corridors, but wide-ranging mammals may frequent the site, including the Black bear (*Ursus americanus*), black-tailed deer (*Odocoileus hemionus columbianus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), short-tailed weasel (*Mustela erminea*) and mink (*Mustela vison*) (Cowan and Guiget, 1978). Short-tailed weasel prints were observed in the snow within Terrestrial Ecosystem Unit 5.

Smaller, more local species likely include the common shrew (*Sorex cinereus*), vagrant shrew (*Sorex vagrans*), dusky shrew (*Sorex obscurus*), snowshoe hare (*Lepus americanus*), Columbian mouse (*Peromyscus oreas*), boreal red-backed vole (*Clethrionomys gapperi*), long-tailed vole (*Microtus longicaudus*), raccoon (*Procyon lotor*), Douglas Squirrel (*Tamiasciurus douglasii*), and several bat species (Cowan and Guiguet 1978; Nagorsen and Brigham, 1993; Nagorsen 1996).

2.4.2 Rare and Endangered Species

Species of concern in British Columbia have a provincial status designation, which is summarized on BC Environment's red or blue list. The red list includes indigenous species or subspecies considered to be Endangered or Threatened. Endangered species are facing imminent extirpation/extinction whereas Threatened taxa are likely to become endangered if limiting factors are not reversed. The blue list includes taxa considered to be Vulnerable because of characteristics that make them particularly sensitive to human activities or natural events (B.C. Environment, 1999). Although blue listed species are at risk, they are not considered Endangered or Threatened. Potential occurrences based on the Conservation Data Centre Tracking for the Squamish District List (B.C. Environment, 1999) are outlined below:

The subject property is within the known range of the blue-listed Townsend's big-eared bat (*Plecotus townsendii*) and the red-listed Keen's long-eared myotis (*Myotis keenii*) (B.C. Ministry of Environment, Lands and Parks, 1997). Although little is known of these species' habitat requirements, good bat foraging opportunities exist over riparian areas such as the one that borders the subject property.

The blue-listed Hutton's vireo (*Vireo huttoni*) occurs in mixed and deciduous forest environments. Although the site is primarily comprised of dense conifers, the vireo may frequent the forest edges bordering the railway line.

The range of the red-listed spotted owl (*Strix occidentalis*) includes the Whistler area, but this species requires extensive tracts of continuous old growth forest for survival. It is unlikely to be found in the study area.

The blue-listed great blue heron (*Ardea herodias*) may feed along the foreshore of Nita Lake. This species is vulnerable to pollution of aquatic environments, human disturbance, and loss of large mature trees next to foraging areas. The great blue heron is, however, not known to nest in the Whistler area (Ricker et al. 1996).

2.4.3 Valued Ecosystem Components

Wildlife Trees

Wildlife trees include significant standing snags, veteran trees, and trees with broken tops. These trees are important as perching areas for raptors, and foraging and nesting sites for woodpeckers, small owls and other cavity nesters. Snags and broken-top trees of suitable size may be present in the young forest. A number of these snags are present on the site.

2.5 Aquatic Environment

Watercourses within or adjacent to the project area include Nita Lake, Gebhardt Creek, the Gebhardt Creek diversion, and three intermittent seepages.

2.5.1 Nita Lake

Nita Lake lies adjacent to the subject property. The lake has a surface area of 11 ha, and forms part of the chain of lakes within the Whistler Valley. The principal tributary to the lake is Whistler Creek although the lake receives flows from Gebhardt Creek and some waters from Alta Lake via interconnecting wetlands and seepage through talus areas. Nita Lake discharges via Jordan Creek to Alpha Lake, and eventually to the Cheakamus and Squamish Rivers. Nita Lake is known to support rainbow trout (*Oncorhynchus mykiss*) and kokanee (*O. nerka*) (Norris and Hawthorn, 1984; DFO, 2000).

2.5.2 Gebhardt Creek

Gebhardt Creek consists of two reaches within and downstream of the subject property. The first reach extends approximately 60m from its mouth at Nita Lake to the BC Rail line. The creek has up to four channels within this delta area, with channel widths

averaging from 1 to 2m. The flows are predominately riffle, with lesser amounts of run and the occasional small pool. The gradient was measured as 5.5%, with bed material of gravels and fines. Stream cover consists of a dense shrub layer dominated by red-osier dogwood, with some large organic debris cover. The stream's discharge was estimated at 0.02m^3/s. There was a 0.6m drop at the outlet of the two 1m by 0.6m oval culverts which conveys the creek under the BC Rail line. This obstacle likely poses a barrier to fish movements.

Gebhardt Creek's second reach extends approximately 60m upstream of the BC Rail line through the remainder of the subject site. The channel width is approximately 4m, with a gradient measured at 32%. The creek is entrenched in a ravine. Flows were estimated as 30% pool, 30% riffle, 10% run, and 30% cascade and falls. The bed material consists predominately of larges, with lesser amounts of gravels and fines, and some bedrock. Riparian vegetation consists of similar species as the adjacent forest, except near the railway grade, where red alder becomes more prevalent. The gradient within the second reach, along with the barrier at the railway culverts, makes Gebhardt Creek unsuitable to support fish upstream of the BC Rail line.

A portion of Gebhardt Creek's flows have been diverted into a small dry gully which parallels the main creek, forming an amenity feature on the subject site. This man-made feature had an average gradient of 30%, with a discharge of approximately 2 l/s on March 8, 2000. Downstream of the site access road this drainage channel ran dry.

2.5.3 Intermittent Drainages

Three intermittent drainages are located on the subject property as shown on Map 2. These drainages consist of ephemeral seepage areas within very small draws. All three were flowing at the time of the site visit (less than 1 l./s each), but will likely be dry soon after the snow leaves the ground. The two southern most drainages lead into a small pool formed by the BC Rail embankment on the foreshore of Nita Lake. It is assumed that a culvert drains this small pool under the rail grade.

2.6 Wetland Environment

A small pool and surrounding vegetation forms a small pocket wetland at the extreme southeastern corner of the subject site. This wetland is an anthropogenic feature, having been formed by the construction of the BC Rail grade along the shoreline of Nita Lake. Vegetation within this feature consists of young deciduous forest, with a relatively dense shrub understory. Due to its limited size and location adjacent to the rail tracks, habitat values associated with this small wetland are severely limited, although flow attenuation and water quality functions are still being accomplished.

3.0 ENVIRONMENTAL CONSTRAINTS

3.1 Cultural Environment

3.1.1 Heritage Features

While the existing buildings are not currently listed in the provincial or municipal registry of heritage sites, they are described in the RMOW Heritage Strategy. As a result the structures should be considered to be moderately constraining to the development of the site.

3.2 Physical Environment

The entire site is identified on the RMOW Environmental Mapping Series as having severe constraints (Talisman, 1996) likely because of the proximity of Nita Lake and the presence of mature trees.

3.2.1 Climate

Climate in the study area represents no obvious constraints or concerns with respect to land transfer or development. However, snowfall is considerable in the Whistler area. A snow removal strategy should be developed to ensure that snow removed from roads and walkways is not deposited in Gebhardt Creek.

3.2.2 Geology

Constraints to development arising from the geological characteristics of the site should be addressed in a separate geotechnical report.

3.2.3 Geomorphology

No constraints were identified arising from the geomorphology of the subject site.

3.2.4 Hydrology

Within the subject property, Gebhardt Creek is confined in a ravine. Providing development does not encroach upon the riparian area, flooding does not appear to be a constraining factor.

The intermittent drainages on the site should be considered marginally constraining to any proposed development.

Nita Lake is separated from the site by the BC Rail line. Due to the upland nature of the subject site, flooding does not appear to be a concern.

3.3 Terrestrial Environment

3.3.1 Soils

No specific constraints were identified concerning soils on the subject site. Engineering capabilities of the soils should be addressed in a separate geotechnical report.

3.3.2 Vegetation

Old growth veterans and tall mature conifers on the subject site should be considered constraining to the development of the subject site. As well, a number of spike topped trees were observed during the site visits that may pose safety concerns.

3.3.3 Wildlife and Wildlife Habitat

The wildlife habitat on the subject site should be considered constraining to development. Mitigation measures outlined in the Conclusions and Recommendations Section of this report will reduce potential negative impacts.

3.4 Aquatic Environment

Gebhardt Creek is a non-fish bearing stream within the subject property, however, the downstream reach, and Nita Lake into which the creek flows are known fish bearing watercourses. The creek therefore, requires an adequate fisheries buffer zone to protect these streams and its associated riparian areas. The diversion channel paralleling the main stem is mainly an aesthetic feature, providing little usable habitat, especially as it runs subsurface within the subject site. Riparian setbacks are not deemed necessary for this man-made drainage.

The intermittent drainages provide minimal habitat values. However, the integrity of the channels should be preserved through appropriate site planning and construction techniques, so that downstream water quality is ensured.

The subject site is not immediately proximal to Nita Lake, and therefore additional site setbacks are not required to protect this waterbody.

3.5 Wetland Environment

The small anthropogenic pocket wetland in the southeastern corner of the subject site should be protected by avoiding development in this area.

4.0 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are made so that opportunities for habitat preservation, mitigation and enhancement can be incorporated into the project's design.

4.1 Conclusions

1. Based on the information reviewed and the findings of the site visits, the subject site appears to be suitable for the type of development proposed. The presence of large trees will require careful site planning, responsive architectural design and construction practices. If these goals are achieved then significant adverse environmental impacts should be avoidable, while lesser impacts should be mitigable.
2. The property is bordered by power lines to the west, and a railway to the east thereby rendering any shrubs along the perimeter of the young forest at Nita Lake to be less ecologically valuable than is generally attributed to riparian fringe habitats.
3. Development of a lodge may locally displace some species of wildlife associated with young coniferous and pole-sapling forest.
4. The younger trees may serve as a windbreak and a visual buffer against the power lines and railway. The retention of tree patches can reduce wildlife displacement.

4.2 Recommendations

Heritage

1. Any development proposal for the site should consider preservation of the existing structures.

Hydrology

2. Hydrology and related engineering issues should be addressed separately through appropriate design. Protecting the seepages will allow for surface run-off to be collected and filtered prior to entering Nita Lake.

Geology/Geomorphology/Soils

3. Engineering issues arising from geological, geomorphological and soil conditions should be addressed by others through appropriate design.

Vegetation / Wildlife

4. Prior to siting of buildings, a significant tree survey should be conducted to allow for maximum preservation of large trees.
5. Efforts should be made to maximize preservation of existing and potential wildlife trees, and young trees that act as visual and sound buffers.
6. The integrity of large trees and snags should be assessed annually by an arborist; potential wildlife trees should be retained wherever possible.
7. Nests of raptors such as Cooper's hawk, northern goshawk and great horned owl found during land-clearing activity must be adequately protected by a forested buffer while the nest is occupied. Nests of bald eagle and great blue heron require protection whether they are active or not.
8. To avoid contravention of the Wildlife Act, land-clearing activity should be avoided between April 15 and July 31, the sensitive nesting period for breeding birds and other wildlife. Under Section 35 of the Wildlife Act, it is an offence to destroy nests occupied by a bird, its eggs or its young. Should land clearing be necessary during this period, a wildlife survey should be conducted to identify nest locations and establish appropriate buffers around active nests until the young have fledged.

Aquatics

9. Any works within the riparian zone of Gebhardt Creek will be subject to BC Environment and DFO approval.
10. A minimum 15m vegetated buffer from the high water mark should be established along Gebhardt Creek as per the Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck, 1993) requirements for residential low density development.
11. The integrity of the intermittent drainage channels should be protected.

Construction

12. Site preparation and building siting should be monitored by a qualified environmental monitor.

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6.0 APPENDIX A

1.0 OFF SITE ISSUES

The RMOW requested additional assessment of environmental issues arising from proposed access routes outside the property (DL2246, Group 1, Lot B, Reference Plan 2643). Specifically, the access road from Alta Lake Road (a.k.a. the West Side Road) and the proposed Valley Trail route from the BC Rail Station at Creekside. The sites were assessed by Dave Williamson, B.E.S., on a number of site visits between April and June 2000.

1.1 The Road Access from Alta Lake Road

The proposed access road traverses adjacent lands owned by Mr. John Taylor to the south of the subject property. The land is currently cleared and substantial rock blasting is completed allowing access to the downslope portions of Mr. Taylor's property. A right of way agreement was negotiated between Mr. Taylor and Mr. Depner. The cleared right of way exceeds that which would be needed for an access road to the London Mountain Lodge site. No losses of vegetation are anticipated to arise from the proposed use of this site.

1.1.1 Hydrology

A small seepage area was observed in the cleared road (see Map, Appendix B). This ephemeral drainage appears to be the result of a rock cut exposing subsurface flow and is currently being directed by a ditch onto the subject site. No other watercourses were observed at or near the proposed access road.

1.1.2 Vegetation

The two vegetation units described as Map Polygons 1 (Terrestrial Ecosystem Mapping Code - DFhs6) and 3 (TEM Code - AM5) in Section 2.3.2.2 of the Initial Environmental Review – London Mountain Lodge (CERG, April 14, 2000 and June 26, 2000) extend south into the Taylor property. These units are identified as Map Polygons 1a, 1b and 3a.

Table A1 Vegetation Units Off Site

TEM Unit Poly #	Site Series	Structural Stage	Site Modifiers	TEM Code
1a	03	Mature Forest	hs	DFhs6
1b	03	Mature Forest	hs	DFhs6
3a	01	Young Forest	c	AM5
9	03	Mature Forest	b	DFb6
10	03	Mature Forest	b	DFb6
11	03	Herb/Denuded Area		UR

1.1.3 Constraints to Development

The road right of way is currently cleared of vegetation. The environmental conditions observed in and around the access road alignment present no observed constraints to this proposed use. The seepage area will be constraining to road construction and should be addressed through a design that manages the flow.

1.2 The Valley Trail from Creekside

The proposed Valley Trail connection would utilize the existing BC Rail lands. The proposed alignment would run parallel to, and upslope of the tracks to the rockcut. Taking advantage of the height of the cut, the trail would cross over the tracks via a covered bridge and ramp down the rock parallel to and between the tracks and Jordan Creek on the other side. As the trail proceeds south the distance between the tracks and the creek reduces to the point where a creek crossing of the trail becomes necessary. At that point, a bridge crossing is proposed to connect the trail to the main Valley Trail.

An underpass is proposed to provide access to the waterfront park headland identified as Map Polygon 7. The actual layout of any trail infrastructure would be at the discretion of the RMOW Parks Department. The proponent has expressed an interest in maintaining access to the existing dock and wishes to investigate opportunities in the future. For the purpose of this report, an alignment of a narrow trail along the shore is delineated.

1.2.1 Hydrology

Waterbodies encountered in proximity to the proposed Valley Trail Connection include Nita Lake and Jordan Creek. As reported in Section 2.5.1 of the Initial Environmental Review these waters are known to support rainbow trout and kokanee (CERG, 2000;

Norris and Hawthorn, 1984; DFO, 2000). However, with the exception of the proposed creek crossing, a riparian buffer is maintained between the trail and the watercourses.

1.2.2 Vegetation

The proposed Valley Trail connection affects a number of vegetation units within and outside the subject area. The vegetation units described as Map Polygons 3 (TEM Code - AM5) 4 (TEM Code - CDc5), 7 (TEM Code - DFb6), 8 (TEM Code - CW4) in Section 2.3.2.2 of the Initial Environmental Review – London Mountain Lodge as well as Map Polygon 12 (TEM Code - UR) found on Table 1A above, extend off site (CERG, April 14, 2000 and June 26, 2000). In addition to the vegetation units 1, 3 and 4 found within the subject property, vegetation units located within the BC Rail lands (Map Polygon 11) and RMOW Park lands (Map Polygons 7, 8 and 10). is denuded of vegetation. Much of the BC Rail land (Map Polygon 11) is cleared of vegetation or consists of scrubby brush. Two types of vegetation units are found on the RMOW lands. The first type (Map Polygons 7 and 10) is described as sparse mature forest characterized by thin soils and frequent bedrock outcroppings. The second unit makes up the delta of Gebhardt Creek and the associated foreshore and is described in Section 2.3.2.2 of the Initial Environmental Review.

1.2.3 Nita Lake Waterfront Park Use

Proposed uses within the area described as Map Polygon 7 on the appended map include light trail development and canoe storage with access across the rail tracks provided via a pedestrian underpass.

Access to Map Polygon 8 would be limited to a light trail providing access to the existing dock.

Map Polygon 10 would contain covered bridge abutments and trail development to Valley Trail standards.

2.0 CONCLUSIONS AND RECOMMENDATIONS

1. The RMOW parklands form a fragmented riparian ecosystem. The presence of the BC Rail line and its associated ongoing impacts dramatically reduce the functionality of the riparian fringe on the western side of Nita Lake.

2. Development of the proposed access road should not cause the loss of any trees off site.

3. No significant losses of vegetation are anticipated in the construction of the proposed trail connection. Some loss of trees should be anticipated within Map Polygon 10.

4. Any development of trails or infrastructure along the shore of Nita Lake or Jordan Creek should be subject to Ministry of Environment, Lands and Parks approval.

Map A1 Existing Environmental Conditions

CASCADE ENVIRONMENTAL RESOURCE GROUP LTD.

WHISTLER OFFICE
3132 Alta Vista Road,
Whistler BC V0N 1B3
Phone (604) 938-1949 Fax (604) 938-1247

SQUAMISH OFFICE.
P.O. Box 1043, 2135 Ridgeway Crescent
Garibaldi Highlands, BC V0N 1T0
Phone (604) 898-9859 Fax (604) 898-4326

Appendix 2

Empire Club Development Corp. Proposed Development Plan

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Issued For: Date:

RMOW EMPLOYEE HOUSING REVIEW MAY 30/18

review 18/10/02

No: Revision: Date:

NORTH

Title OVERALL SITE PLAN

Project **Hillman Lodge** Whistler, BC

MURDOCH + COMPANY
ARCHITECTURE + PLANNING LTD.
#106-4319 Main St.
P.O. Box 1394
Whistler, B.C. V0N 1B0
T. 905-6992
e-mail murdoch@telus.net

Sealed By:

Drawn By:	Scale:
BM/JL	1:500 METRIC
Project No:	Sheet No:
1404	A-1.0

A-1.0 OVERALL SITE PLAN

ROAD

POWER LINES

BC HYDRO R/W REF. PLAN 2210

PART OF LOT 34 PLAN BCP1933

S.L. 13

S.L. 12

COMMON PROPERTY

ex. cul de sac approx. 680 (+45) from Whistler Web Map

Existing Valley Trail: (Public Trail Access through Nita Lake Estates)

Existing Valley Trail

forested slope

7.6

FIRE HYDRANT

garbage/ recycling/ mail

outdoor amenity area/ open space approx. 200 m2

5 Townhouse Units (3BR) RESIDENT

recreation bldg pool / hot tub

check-in/ amenity bldg

Valley Trail

NOTE PROPOSED GRADING IS CONCEPTUAL/ ILLUSTRATIVE PENDING CIVIL/SITE GRADING

6 Townhouse Units (3BR) MARKET

4 Townhouse Units (3BR) MARKET

existing gravel road approx. 10.5% slope

90 m

S.R.W. PLAN BCP 26

existing building

bridge and road to lands beyond

15 m riparian setback

30m setback

RMOW 30m Riparian Buffer

RMOW 30m Hydrography Buffer

PROPERTY LINE

15 m Riparian Setback

30m CN Right-of-Way

30 m Railway Setback

C.N. RAIL R/W REF. PLAN 1066

NITA LAKE

Available Park Land Outside Preferred Setbacks (306m2)

Appendix 3

Bunbury & Associates Land Surveying Ltd. Site Survey

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BC LAND SURVEYOR'S TOPOGRAPHIC SURVEY PLAN

OF LOT B, D.L. 2246, REF PLAN 2643, GP.1, NWD.

Nita Lake Drive, Whistler, BC

5 0 5 10 15 20

The intended plot size is 864mm in width by 1120mm in height (E Size) when plotted at a scale of 1:400.

All distances are horizontal ground-level distances in metres and decimals thereof, unless otherwise noted.

PART OF LOT 34
PLAN BCP1933

BC HYDRO R/W REF. PLAN 2210

LOT B
REF PLAN 2643

S.R.W. PLAN BCP16426

C.N. RAIL R/W REF. PLAN 1066

ROAD

COMMON PROPERTY

S.L. 1

S.L. 13

S.L. 12

STRATA PLAN BCS 556

89° 27' 13" 78.800'

37° 47' 54" 79.880'

37° 32' 22" 398.025

67° 17' 53" 30.000'

17° 57' 53" 5.060

67° 17' 53" 239.533

90° 01' 40"

r= 307.400
a= 51.505

r= 233.745
a= 156.978

117° 38' 54"

30° 00' 53"

15° 33' 53"

x 298.8 Denotes Existing Ground Elevation

Property line dimensions are derived from Ref. Plan 2643.

FB 2150 Pg 68-83, 104-115, 138-141
FB 2151 Pg 10-17, 31-49
File 18-02803.dwg

BUNBURY & ASSOCIATES
LAND SURVEYING LTD.
SQUAMISH 604-892-3090
WHISTLER 604-932-3770
WWW.BUNBURY-SURVEYS.COM

SITE BENCHMARK:

Bunbury Tag #309
Elev= 679.75m

Elev. derived from San. Manhole S21 Rim, Elev.= 679.29m as shown on Webster Engineering Ltd As-built drawing No. 2824-S-1

Certified Correct this 16th day of August, 2018.

Paul A.T. Bunbury, BCLS #688

D1610

Appendix 4

Species at Risk Status Definitions

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Status Definitions For Provincial and Federal Species at Risk

Status Definitions as per provincial Conservation Data Centre (CDC)

RED: Species that are candidates for Extirpated, Endangered, or Threatened status in BC. Placing taxa on these lists flags them as being at risk and requiring investigation.

BLUE: Species considered of Special Concern in BC. Taxa of Special Concern have characteristics that make them particularly sensitive or vulnerable to human activities or natural events.

Status Definitions as per federal Species at Risk Act (SARA)

ENDANGERED: A wildlife species that is facing imminent extirpation or extinction.

THREATENED: A wildlife species that is likely to become an endangered species if nothing is done to reverse the factors leading to its extirpation or extinction.

SPECIAL CONCERN: A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats.

SCHEDULE 1: Official list of federally protected species.

SCHEDULE 2 and 3: Species under assessment for inclusion to Schedule 1.

Appendix 5

Site Photographs

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Photograph 1:

Gebhardt Creek upstream of access road

Photograph 2:

Gebhardt Creek downstream of access road

Photograph 3:

Side channel downstream of access road

Photograph 4:

Side channel upstream of access road

Photograph 5:

Mossy seep in Polygon 1

Photograph 6:

Pool in southeast corner of Site, Polygon 4

Photograph 7:

Polygon 1 typical habitat

Photograph 8:

Polygon 4 adjacent the pool

Photograph 9:

Gravel access road through the Site

Photograph 10:

Polygon 7 rock outcrop and park area

Photograph 11:

Polygon 8, Gebhardt Creek braided around a large western redcedar

Photograph 12:

Polygon 9, rock outcrop adjacent BC Hydro ROW

Photograph 13:

Nest cavity observed in Polygon 2

Photograph 14:

Woodpecker feeding holes in Polygon 2