ENVIRONMENTAL IMPACT ASSESSMENT

19963 NcNeil Road

PITT MEADOWS BRITISH COLUMBIA

Prepared for:
BC STAR DEVELOPMENT CORP.

Prepared by:

AQUATERRA ENVIRONMENTAL LTD.

AquaTerra Project No. 20221035(B)

September 2024 [REV.0]
January 2025 [REV.1]

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1 PROJECT BACKGROUND

Sheridan Hills (**Figure 1**) is a large parcel situated within the City of Pitt Meadows (the 'city') and is currently owned by BC Star Development (the 'client'). The parcel has been divided into two (2) sites, with the 5 hectare (ha) site referenced as 19963 McNeil Road (the 'site') being the focus of this Environmental Impact Assessment (EIA); **Figure 2**. The client retained AquaTerra Environmental Ltd. ('AquaTerra') to evaluate aquatic and terrestrial environmentally sensitive areas and potential development opportunities and constraints associated with the development of the site, which is proposed to be subdivide into five (5) residential lots. Proposed development details are provided in **Appendix A**, which also includes a proposed 30 m vegetated retention buffer along the western site boundary. A preliminary Development Feasibility Study for the entire Sheridan Hills parcels was completed by AquaTerra in 2022 focusing on terrestrial and aquatic habitats and their respective inhabitants. At the request of the city, a focused EIA was completed specifically for the site as well as an evaluation of the applicability of provincial and federal legislation that may be applicable to the site. Revision 1 incorporates comments provided by the City of Pitt Meadows.

Figure 1: Sheridan Hills approximate Parcel Boundary (Red Polygon) and Surrounding Areas.

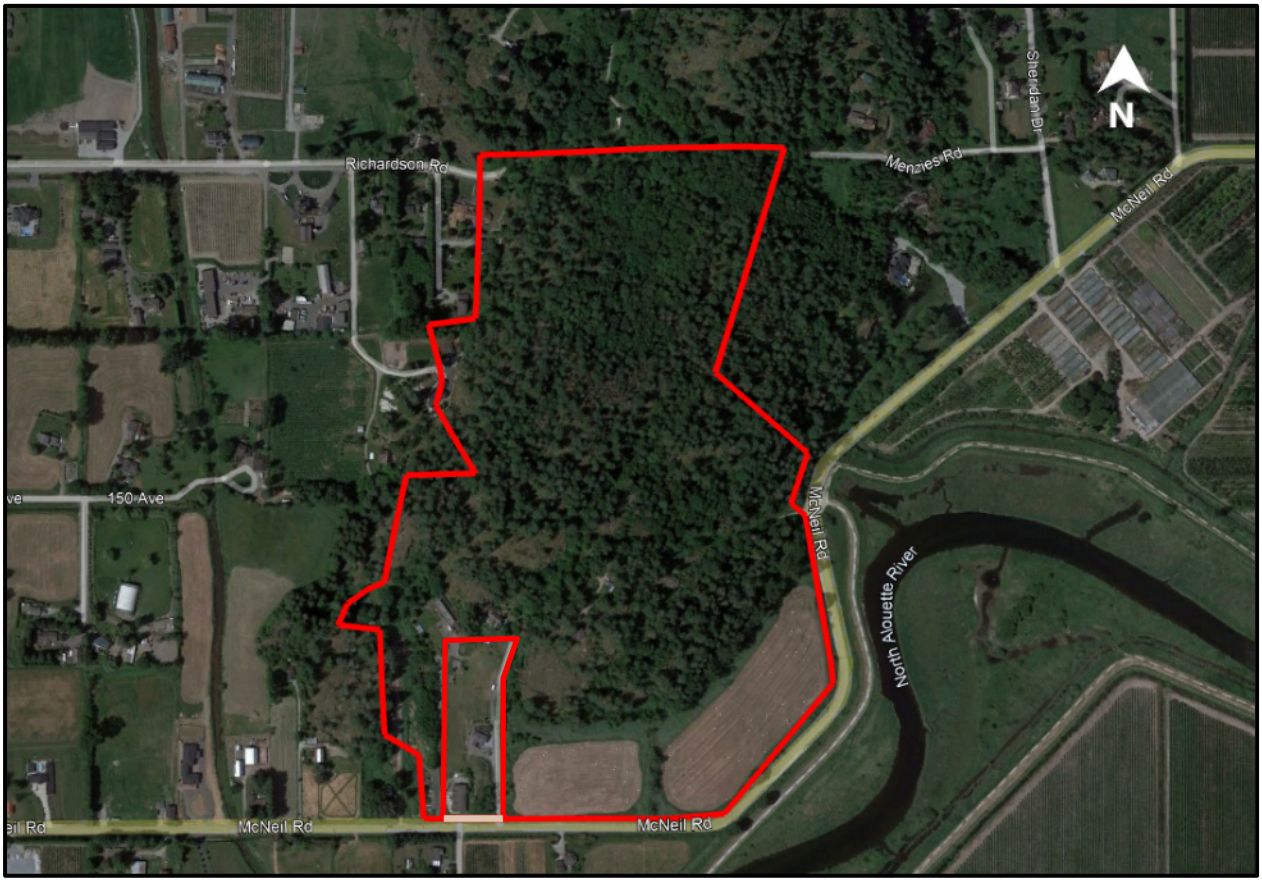
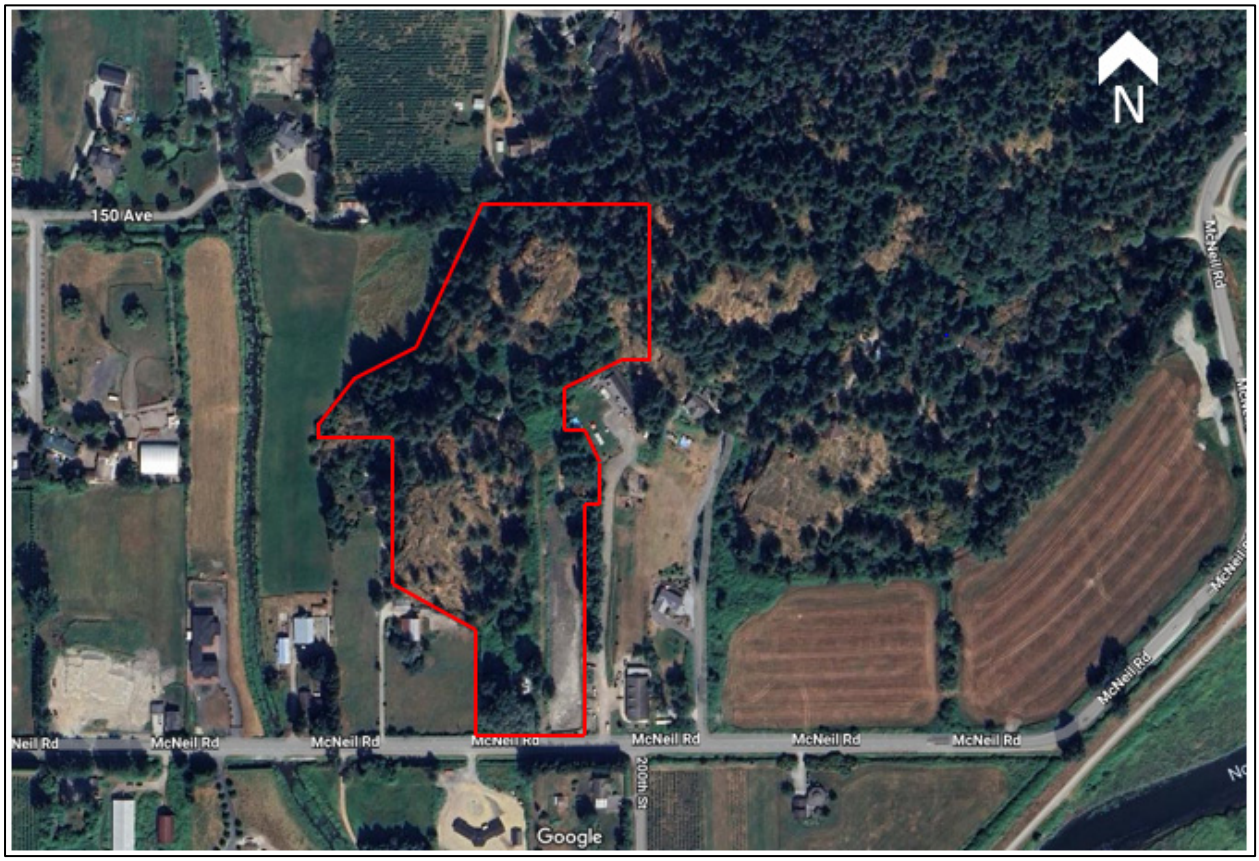


Figure 2: 19963 McNeil Road approximate 5 Hectare Site Boundary (Red Polygon) and Surrounding Areas.



2 OBJECTIVES

The primary objectives of this Environmental Impact Assessment are to:

1. Report relevant background environmental information and data applicable to the site;
2. Summarize field observations from aquatic, riparian and terrestrial field studies to identify potential development opportunities and constraints;
3. Develop a series of detailed figures and tables summarizing 2022 and 2024 field survey observations and outlining potential development opportunities and constraints; and
4. Provide recommendations and mitigation strategies to facilitate development in accordance with applicable bylaws, regulations, guidelines and provincial and federal legislation.

3 REPORT LIMITATIONS

While findings and conclusions documented in this detailed Environmental Impact Assessment have been prepared in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession practicing under similar circumstances, this report is not intended, nor is it able, to provide a totally inclusive review of past or present environmental conditions within the site area. This report is intended to provide information to reduce, but not necessarily eliminate, uncertainty regarding the potential for constraints associated with site development.

4 SITE OVERVIEW

The approximate area of the site is 5 hectares. The site consists of mixed forested lands, rocky outcrops and a grassy field, and contains one derelict, unoccupied home and several unoccupied out-buildings. The forested sections of the site have been logged historically and currently consist of primarily second-growth mature mixed stands dominated by Western Redcedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesiii var. menziesii*), and Big-leaf Maple (*Acer macrophyllum*). Invasive species, including Japanese Knotweed, Himalayan Blackberry (*Rubus armeniacus*), Himalayan Balsam (*Impatiens gladulifera*), and Reed Canary Grass (*Phalaris arundinacea*), as well as a variety of ornamental plants, have dominated the current yard sites. The Pitt River is situated approximately one and a half (1.5) kilometers to the north, and directly southeast, the North Alouette River flows from Jacob's Lake, which eventually confluences with the Alouette River approximately 500 m directly south of the site boundary. Fenton Slough, approximately 100 m from the westernmost site boundary serves predominantly as irrigation for nearby agricultural lands as well as flood prevention. This watercourse has been identified as a "key - main channel" based on the City of Pitt Meadows GIS mapping system ("Meadows Mapview"), which has connectivity to both the Pitt River and the Alouette River. Seasonal surface flow (i.e., water present for <6 months of the year) discharges from the site via an agricultural drainage ditch, while a permanent roadside ditch is situated on the south side of McNeil Road, opposite the site.

5 MUNICIPAL AND REGULATORY DEVELOPMENT FRAMEWORKS

This section outlines the applicable municipal environmental requirements with the City of Pitt Meadows relating to development.

5.1 Pitt Meadows - Natural Environment

The current City of Pitt Meadows Official Community Plan (OCP)[1] from 2022 includes a section (Chapter 3 – Environment & Natural Areas), which includes policies to protect the environment, minimize impacts to wildlife, to encourage sustainability and stewardship, and to identify and protect environmentally sensitive areas and assets to the maximum extent possible. The OCP identifies those areas of the municipality that are considered environmentally sensitive, which may contain environmental attributes that are worthy of retention or special care.

Environmental Impacts of Future Development include a number of policies including development permit guideline and bylaws to ensure appropriate measures be taken when development occurs in hazardous / erosion prone areas, as well as completion of environmental impacts assessments for proposed development outside of the Urban Containment Boundary. Other measures include the encouraged retention of existing trees and additional tree / planting materials, inclusion of integrated stormwater management plans, and cooperation with regional, provincial and federal environmental agencies to ensure effective management of environmentally sensitive areas. Based on the OCP Schedule 8 map (**Insert 1**), the site does not appear to be situated in a mapped environmentally sensitive area.

5.2 Watercourse Protection

The City of Pitt Meadows has adopted the Riparian Areas Protection Regulation (RAPR) mandated under the BC *Riparian Areas Protection Act.* The RAPR framework requires the implementation and adherence to watercourse-specific, prescriptive setbacks based on watercourse characteristics (i.e., average High Water Mark [HWM] width measurements) and measures (e.g., windfirm boundary, danger tree, geotechnical considerations, floodplain extents, etc.) for any watercourses within 30 m of the site boundaries. Watercourse setbacks include consideration for: a) Large Woody Debris and Bank Stability; b) Insect Fall and Litter Drop; and c) Shade. Setbacks are a multiple of the average stream width and are measured perpendicularly

[1] Available online: https://www.pittmeadows.ca/homes-development/zoning-land-use/official-community-plan-0

from the HWM as opposed to the top-of-bank, but do consider geotechnical setback and tree protection requirements under the measures section.

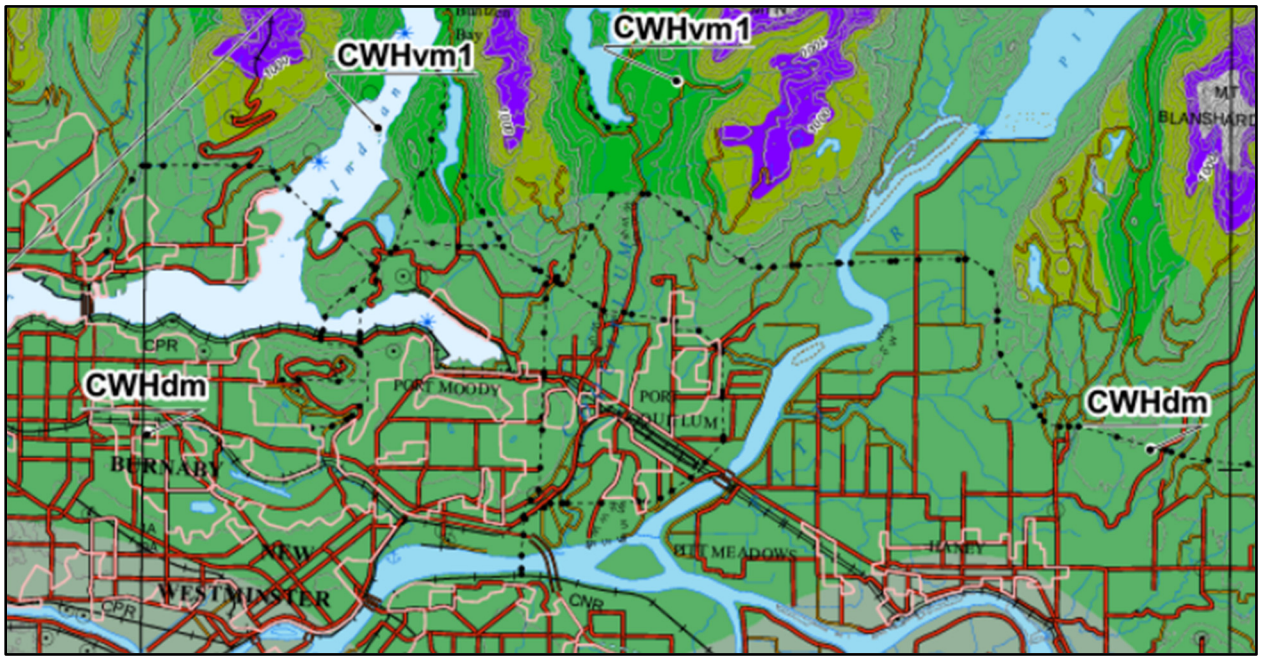
Insert 1: Official Community Plan (OCP) – Schedule 9 - Environmentally Sensitive Areas Map and Site (Arrow).

6 BACKGROUND REVIEW RESULTS

6.1 Biogeoclimatic Zone

The site is situated within the Coastal Western Hemlock (CWH) biogeoclimatic zone (**Figure 2**), which occurs at low to middle elevations mostly to the west of the coastal mountains, along the entire British Columbia Coast, and on into both Alaska and Washington/Oregon. The CWH consists of 10 subcategories of continentality (hypermaritime, maritime, and submaritime subzones) and precipitation (very dry, dry, moist, wet, and very wet). Applicable to the site is the Coastal Western Hemlock Dry Maritime Subzone (CWHdm), occurring at low elevations on the mainland and immediately adjacent islands. Elevational limits range from sea level to approximately 650 m. The CWHdm has warm, relatively dry summers and moist, mild winters with little snowfall. Growing seasons are long and feature only minor water deficits on zonal sites. The mean annual temperature is approximately 8°C and ranges from 5.2°C to 10.5°C among the CHW subzones. The mean annual precipitation for the zone is 2228 mm (ranging from 1000 to 4400 mm) (MOF, 1991).

Figure 2: Biogeoclimatic Zone (CWHdm) for the Site and Surrounding Area.



The following climate information is based on data collected by Environment Canada at the Coquitlam Como Lake STP weather station (49° 16'N, 122° 52'W; 160.0 meters [m] elevation) between 1971 and 2000, located approximately 4.4 kilometers (km) south of the site.

Daily Mean Temperature	Not listed
Precipitation	1924 mm/year
Highest Monthly Avg.	November, 299.1 mm
Lowest Monthly Avg.	July, 61.5 mm

6.2 Local Ecology

Dominant forest species of the drier maritime subzones (including the CWHdm subzone) typically have a substantial component of Douglas-fir (*Pseudotsuga menziesii*), along with Western Hemlock and Western Redcedar (*Thuja plicata*). Salal (*Gaultheria shallon*), Dull-Oregon Grape (*Mahonia nervosa*) and Red Elderberry (*Vaccinium parvifolium*) typify the poor-to-moderately developed shrub layer. Oregon Beaked Moss (*Kindbergia oregana*), Step Moss (*Hylocomium splendens)*, Lanky Moss (*Rhytidiadelphus loreus)* and Flat Moss (*Plagiothecium undulatum*) dominate the well-developed moss layer.

6.3 Federal and Provincial Databases and Mapping Utilities

Accessible federal, provincial and public databases as well as mapping utilities were queried to collect pertinent biophysical information associated with the site. Results are provided in the following sections.

6.3.1 BC Species & Ecosystems Explorer – Species-at-risk overview (https://a100.gov.bc.ca/pub/eswp/)

Species listed on the BC Species & Ecosystems Explorer for the Pitt Meadows District was queried on 20 June 2022, and reevaluated on 11 July 2024, to evaluate which species may be present within or adjacent to the site. The list was evaluated based on available local area habitats and known habitat requisites for each species. The result is the following comprehensive list of provincially and federally ranked species-at-risk potentially occurring on-site along with their respective rankings:

Mammals

- Pacific Water Shrew (*Sorex bendirii*) – Red; Endangered
- Townsend's Big-eared Bat (*Corynorhinus townsendii*) - Blue
- Trowbridge's Shrew (*Sorex trowbridgii*) – Blue

Birds

- Band-tailed Pigeon (*Patagioenas fasciata*) – Blue; Special Concern

- Barn Swallow (*Hirundo rustica*) – Blue; Special Concern
- Common Nighthawk (*Chordeiles minor*) – Yellow; Special Concern
- Great Blue Heron (*Ardea herodias fannini*) – Blue; Special Concern
- Green Heron (*Butorides virescenes*) – Blue
- Olive-sided Flycatcher (*Contopus cooperi*) – Blue; Special Concern
- Western Screech-Owl (*Megascops kennicottii kennicottii*) – Blue; Threatened

Reptiles and Amphibians

- Coastal Tailed Frog (*Ascaphus truei*) – Yellow; Special Concern
- Northern Red-legged Frog (*Rana aurora*) – Blue; Special Concern
- Northern Rubber Boa (*Charina bottae*) – Yellow; Special Concern
- Western Toad (*Anaxyrus boreas*) – Yellow; Special Concern

Invertebrates

- Dun Skipper (*Euphyes vestris*) – Blue; Threatened
- Monarch (*Danaus plexippus*) – Red; Endangered
- Oregon Forestsnail (*Allogona townsendiana*) – Red; Endangered
- Threaded Vertigo (*Nearctula* sp.) – Blue; Special Concern

Vascular Plants

- American Sweet-flag (*Acorus americanus*) – Blue
- Streambank Lupine (*Lupinus rivularis*) – Red; Endangered
- Vancouver Island Beggarticks (*Bidens amplissima*) – Blue; Special Concern
- Washington Springbeauty (*Claytonia washingtoniana*) – Red

Mosses

- Poor Pocket Moss (*Fissidens pauperculus*) – Red; Endangered
- Roell's Brotherella (*Brotherella roellii*) – Red; Endangered

A detailed discussion of those federally listed sensitive species that may utilize the site to an appreciable degree is included in Section 8.2.3.

6.3.2 Conservation Data Center (http://www.env.gov.bc.ca/atrisk/ims.htm)

The BC Conservation Data Center (CDC) database was queried on 16 June 2022 and 11 July 2024 to obtain details on known occurrences of rare animal species or plant communities for the site and surrounding areas. The CDC is part of the Wildlife Inventory Section of the Resource Inventory Branch of the BC Ministry of Environment[2] (MOE) that uses a listing process to identify species that are candidates for legal designation as extirpated, endangered, or threatened (**Red-listed**), as well those species that are of special concern (**Blue-listed**).

The results of the CDC query indicated no records of rare species or plant community's occurrence in the CDC database mapped specifically for the site. Eleven (11) non-sensitive elemental occurrences were recorded within approximately five (5) kilometers of the site, which are summarized in **Table 1**. The potential for these species to occur within or adjacent to the site is discussed in Section 7.3. A summary of the CDC mapping results is provided in **Appendix B**.

Table 1: BC Conservation Center Results – Organized by Distance from Site

Shape ID	Common Name	Scientific Name	Provincial; Federal Ranking*	Observed Location	Distance from Site (km)	Last Observed
126474	Vancouver Island Beggarticks	*Bidens amplissima*	Blue; SC	North Alouette River	0.6	2019
126470	Vancouver Island Beggarticks	*Bidens amplissima*	Blue; SC	Pitt River	1.4	2018
112455	American Sweet-flag	*Acorus americanus*	Blue	Alouette River, South Bank	1.7	2017
126472	Vancouver Island Beggarticks	*Bidens amplissima*	Blue; SC	Alouette River, Goose Bar	1.8	2019
126433	Vancouver Island Beggarticks	*Bidens amplissima*	Blue; SC	Alouette River, Pitt Meadows	3.14	2017
60745	Coastal / Western Painted Turtle	*Chrysemys picta*	Red; T	Mount Burke, Coquitlam	3.23	2019
40489	Washington Spring beauty	*Claytonia washingtoniana*	Red	Minnekhada Regional Park	3.4	2004
8000	Great Blue Heron	*Ardea herodias fannini*	Blue; SC	De Boville Slough	3.9	1997
33295	Northern Red-legged Frog	*Rana aurora*	Blue; SC	Mount Burke	3.9	2009

[2] Presently referenced as the Ministry of Forests, Lands and Natural Resource Operations (MFLNRO).

143950	Rocky Mountain Ridged Mussel	*Gonidea angulata*	Red; SC	Pitt River	4.2	2023
6964	Green Heron	*Butorides virescens*	Blue	De Boville Slough	4.6	1985

*S: Special Concern; T: Threatened.

Listed plant communities of concern that may be present locally include: Western Redcedar / Sword Fern Dry Maritime (Red-listed), Sitka Sedge / Pacific Water-parsley (Blue-listed) and Sitka Spruce / Salmonberry Dry (Red-listed). The site holds attributes that indicate Western Redcedar / Sword fern Dry Maritime plant communities present, which was confirmed by the Environmental Monitors on-site. There was no indication that "Sitka Sedge / Pacific Water Parsley" or "Sitka Spruce / Salmonberry Dry" plant communities were present on site.

6.3.3 BC iMAP (http://maps.gov.bc.ca/ess/sv/imapbc/)

The BC iMAP database and mapping utility was queried on 17 June 2022 and 11 July 2024. Query results confirm that the site and surrounding area are not part of a designated or proposed Wildlife Habitat Area (WHA) nor is the site situated within a Wildlife Management Area (WMA). Similarly, no reported amphibians, reptiles, birds, or mammals have been mapped within the site area boundaries.

6.3.4 Community Mapping Network (http://www.cmnbc.ca)

The Sensitive Habitat Inventory Mapping (SHIM) database, the Great Blue Heron (GBHE) Management Team database, and the Wildlife Tree Stewardship (WiTs) database were queried on 17 June 2022 and 11 July 2024 to evaluate watercourse features and the potential for raptor or heron nests within or adjacent to the site boundaries. One (1) watercourse is mapped within the site and identified as "Unknown" in the Sensitive Habitat Inventory Mapping Atlas (**Appendix C**). It is illustrated as a hillside run-off that flows to the southwest.

AquaTerra personnel investigated the mapped watercourse during the development feasibility assessment to determine if sensitive fish species were present on the site. The watercourse was dry, having been channelized / redirected as a drainage ditch bisecting the southwest corner of the site and flowing southward, with no notable headwaters or groundwater inputs. The SHIM database classified the North Alouette River, which is situated adjacent to the south site boundary,

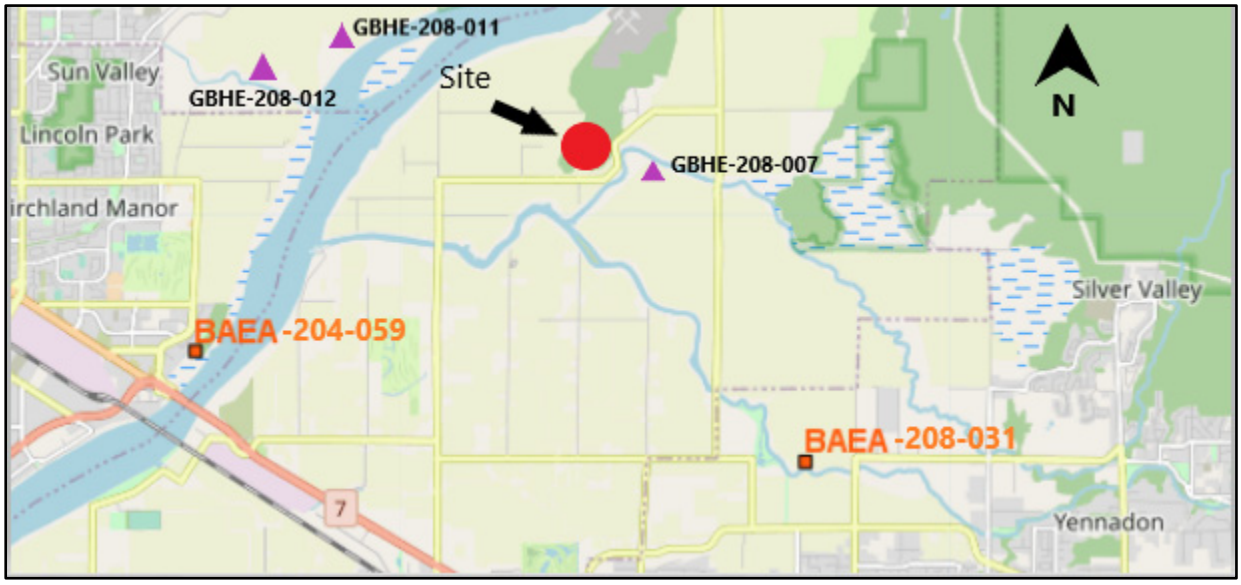
as “Endangered”, as illustrated in **Appendix C**. The SHIM database indicates this particular reach of the North Alouette River may possess qualities of an endangered watershed due to water quality, logging, riparian removal, and channelization / dyking. Due to the limited connectivity and aquatic assessments conducted, it is not anticipated that the North Alouette River will have any adverse effects with proposed development.

The review of the Great Blue Heron (GBHE) Management Team database and Wildlife Trees Stewardship (WiTs) database did not identify any existing or historic raptor or heron nests within the site boundaries. Two (2) Bald Eagle (*Haliaeetus leucocephalus*) nests and three (3) Great Blue Heron *(Ardea herodias fannini)* nests were located within approximately 5 km from the site as shown in **Figure 3** and **Table 2**, with the closest being situated approximately 500 m from the site.

Table 2. GBHE Management Team and Wildlife Tree Stewardship database results**.**

Identification	Common/Scientific Name	Distance to site
BAEA-204-059	Bald Eagle (*Haliaeetus leucocephalus*)	5.2 km
BAEA-208-031	Bald Eagle (*Haliaeetus leucocephalus*)	4.2 km
GBHE-208-007	Great Blue Heron *(Ardea herodias fannini)*	0.5 km
GBHE-208-011	Great Blue Heron *(Ardea herodias fannini)*	3.8 km
GBHE-208-012	Great Blue Heron *(Ardea herodias fannini)*	4.4 km

Figure 3. Map view of GBHE Management Team and Wildlife Tree Stewardship database results.



6.3.5 Habitat Wizard (http://maps.gov.bc.ca/ess/hm/habwiz/)

The province of British Columbia's "Habitat Wizard" mapping utility was queried on 17 June 2022 and 11 July 2024 to evaluate the presence of watercourses and fish within or adjacent to the site boundaries. Habitat Wizard indicated no watercourses within the site, although provided information on the North Alouette River located to the east of the site, which provided documentation of Chum Salmon (*Oncorhynchus keta*), Steelhead (*Oncorhynchus mykiss*), Coho Salmon (*Oncorhynchus kisutch*), Threespine Stickleback (*Gasterosteus aculeatus*), Prickly Sculpin (*Cottus asper*), and invasive species such as Pumpkinseed (*Lepomis gibbosus*), and Peamouth Chub (*Mylocheilus caurinus*). A query performed on 11 July 2024 also indicated the presence of Rainbow Trout (*Oncorhynchus mykiss*), Coastal Cutthroat Trout (*Oncorhynchus clarkii clarkii*), and Northern Pikeminnow (*Ptychocheilus oregonensis*) within the North Alouette River.

6.3.6 Fisheries Information Summary System (FISS) (http://www.env.gov.bc.ca/fish/fiss/index.html)

The BC Fisheries Information Summary System (FISS) was queried on 17 June 2022 & 11 July 2024 to evaluate the presence of watercourses and fish presence within or adjacent to the site boundaries. FISS results did not provide any indication of fish presence or watercourses within the site boundaries at the time of assessment.

6.4 Historical Reports

Historical reports reviewed as part of this Environmental Impact Assessment include the 2022 AquaTerra Preliminary Development Feasibility Assessment, which is referenced and incorporated into the pertinent sections of this EIA and a report, by others, summarized below.

6.4.1 Environmental Assessment Report – Phoenix Environmental Services Ltd.

In 2014, Phoenix Environmental Services Ltd. issued a detailed environmental assessment report outlining a biophysical inventory including topographic and geological features, vegetation communities, aquatic features, wildlife, and wildlife habitat including species at risk. The focus of this assessment was the site (19963 McNeil Road lands). Environmental impacts were discussed along with a description of the proposed development concept for this location at the time. The report identifies the surrounding landscape as being flat agricultural land transitioning into forested, steep, rocky outcrop slopes north from McNeil Road. No permanent watercourses were

reported within the site boundaries although a major drainage and irrigation channel, known as “Fenton Road Slough " runs parallel to the west of the site. Fenton Road Slough was identified as being situated approximately 100 m from the western boundary and flows from the Pitt River, confluencing with the Alouette River approximately 500 m from the southernmost site boundary. A variety of vegetation was documented, with the majority composed of mixed forest with rock outcroppings. Wildlife trees and snags were observed throughout the site indicating increased habitat value and foraging locations. Increased invasive plant species were recorded near the buildings on site, and along man-made access roads. Dense Himalayan Blackberry was observed along the access road and the constructed ditch on the southwestern portion of the site. Wildlife observed included up to thirty (30) species of songbirds along with two (2) raptor species including the Red-tailed Hawk (*Buteo jamaicensis*), and Turkey Vulture (*Cathartes aura*). A Bald Eagle (*Haliaeetus leucocephalus*) nest was also reported as being on-site; however, subsequent checks by AquaTerra Environmental during subsequent assessments did not identify this reported nests. Anecdotal information from the client notes that the nest may have come down in a wind storm in the preceding years. Black bear (*Ursus americanus*) and Black-tailed Deer (*Odocoileus hemionus* ssp. *columbianus*) were reported as being directly observed at the time of assessment. Coyote (*Canis latrans*) and Black-tailed Deer scat were identified along the roadway indicating use as a travel corridor. No federally or provincially listed species were observed on site at the time of assessment.

7 FIELD SURVEY METHODOLOGY

On 09-10 June and 12 July 2022, AquaTerra Environmental Ltd. personnel conducted a detailed field survey to evaluate for potential watercourses, document aquatic and terrestrial habitat attributes, and inventory for unique natural features for the entire Sheridan parcel inclusive of 19963 McNeil Road. Field crews commenced work at McNeil Road assessing aquatic and riparian habitats on the southwest portion of the site including the ditch along McNeil Rd. This was followed by the assessment of twenty-three (23) vegetation plots across the parcel in a variety of different habitat types including conifer forest, mixed forest, and rock outcrops. Terrestrial habitat features were assessed and documented simultaneously. Field survey results are discussed in detail in the following sections. Select photographs taken during the field survey are provided in **Appendix D**.

On 05 and 09 July 2024, AquaTerra Environmental Ltd. personnel conducted a supplementary field survey, limited to the 5 ha 19963 McNeil Rd site. The purpose of the field survey was to confirm the conditions remained unchanged relative to the 2022 surveys, to identify Valued Ecosystem Components (VECs) within the site, evaluate potential impacts associated with the proposed development, identify different ecosystems and their boundaries, document general wildlife sign, and evaluate the applicability the Riparian Areas Protection Regulation (RAPR) to establish prospective watercourse setbacks, if any.

7.1 Aquatic and Riparian Habitats

The aquatic habitat, assessed in 2022 within the full clients parcel, consisted of seasonally wetted areas, permanent and non-permanent (i.e., water present greater, or less than 6 months of the year, respectively) and unmarked, constructed ditches and run-off drainages. Specific to the site is a man-made drainage ditch running north-to-south along the eastern portion of the site.

The observed man-made drainage ditch was historically re-aligned, for agricultural purposes, as noted by the client. The areas within the ditch that retained water in the 09 and 10 June 2022 surveys were found dry or nearly dry on 12 July 2022 and during the supplementary field survey on 07 and 09 July 2024, the ditch was dry, with no standing water, noting only a few lower lying areas with saturated soils. Attempts to identify the presence of aquatic inhabitants in 2022 via the trapping of the ditch with minnow traps yielded no captures, noting one exotic Green Frog (*Rana clamitans*) near one of the traps in 2022, noting this species is not native and not afforded any protection per the regulations.

The AquaTerra team evaluated potential connectivity with upslope areas to the north, confirming the presence of a decorative fountain / pond area on an adjoining property to the east that was not hydraulically connected to the ditch. This was subsequently verified by the site owner in conjunction with discussions with the neighbour in late 2024 and early 2025, which concluded the water was recirculated from a decorative pond and did not result in run-off or connectivity to the drainage ditch on-site. This information was subsequently provided to the City of Pitt Meadows and reportedly accepted as being sufficient to satisfactorily address their queries.

7.2 Terrestrial Habitat

AquaTerra personnel assessed terrestrial habitats on 07 July 2024, to verify the accuracy of previous reports, the preliminary interpretation of the high-resolution 2018 aerial photograph, and the 2022 AquaTerra assessment observations. The 5-hectare site was thoroughly surveyed on foot by two AquaTerra biologists to ground-truth previous survey findings, inventory vegetation, wildlife, unique habitat features and invasive species.

7.3 Wildlife and Wildlife Habitats

Wildlife observations, including direct and indirect sign (scat, pellets, feathers, plucking stations, bedding areas, tracks, and potential den sites) were documented, as observed during the aquatic and terrestrial habitat surveys. Additionally, potential nests regulated under the *Wildlife Act* and *Migratory Birds Convention Act* were also assessed.

8 DEVELOPMENT OPPORTUNITIES & CONSTRAINTS

8.1 Terrestrial and Sensitive Habitats

The site is comprised of mature second-growth coniferous forest with pockets of mature mixed forest, rock outcroppings, and mixed-grass agricultural land. The summary of terrestrial vegetation observations is provided in **Appendix E**. The mapped boundaries of the provincially-red listed (endangered) Western Redcedar / Sword Fern Dry Maritime (Red-listed) ecosystem delineated via the vegetation plots and aerial photography is illustrated in **Figure 6**. Unique terrestrial habitat features such as wildlife trees and bedding locations are provided in **Figure 7**. The location of this red-listed Western Redcedar / Sword Fern ecosystem community will largely be retained via the 30 m ALR buffer (**Appendix A**), which generally encapsulates the mapped red-listed ecosystem per **Figure 6** and is deemed to be effective mitigation.

Figure 6: Western Redcedar / Sword Fern Dry Maritime (Red-listed) Ecosystem Attributes, Inclusive of the Site.

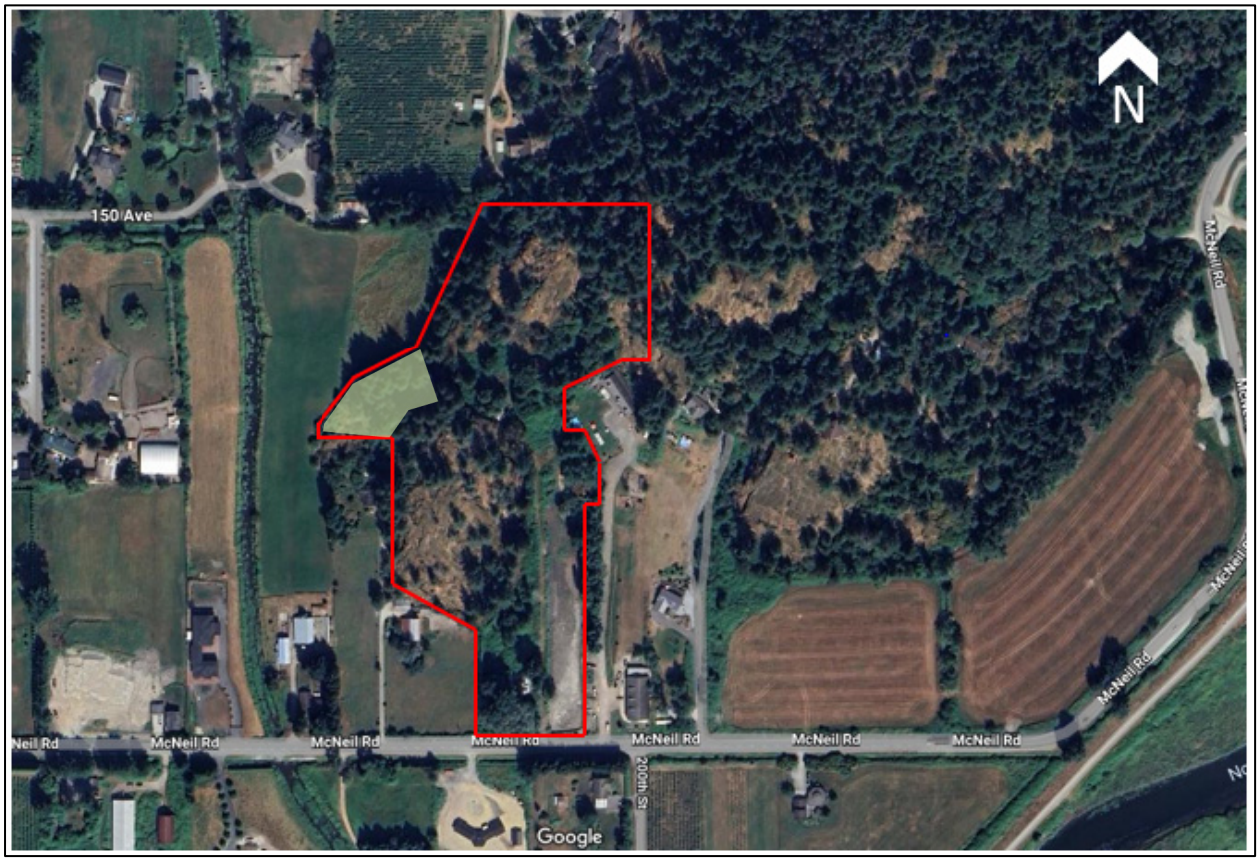
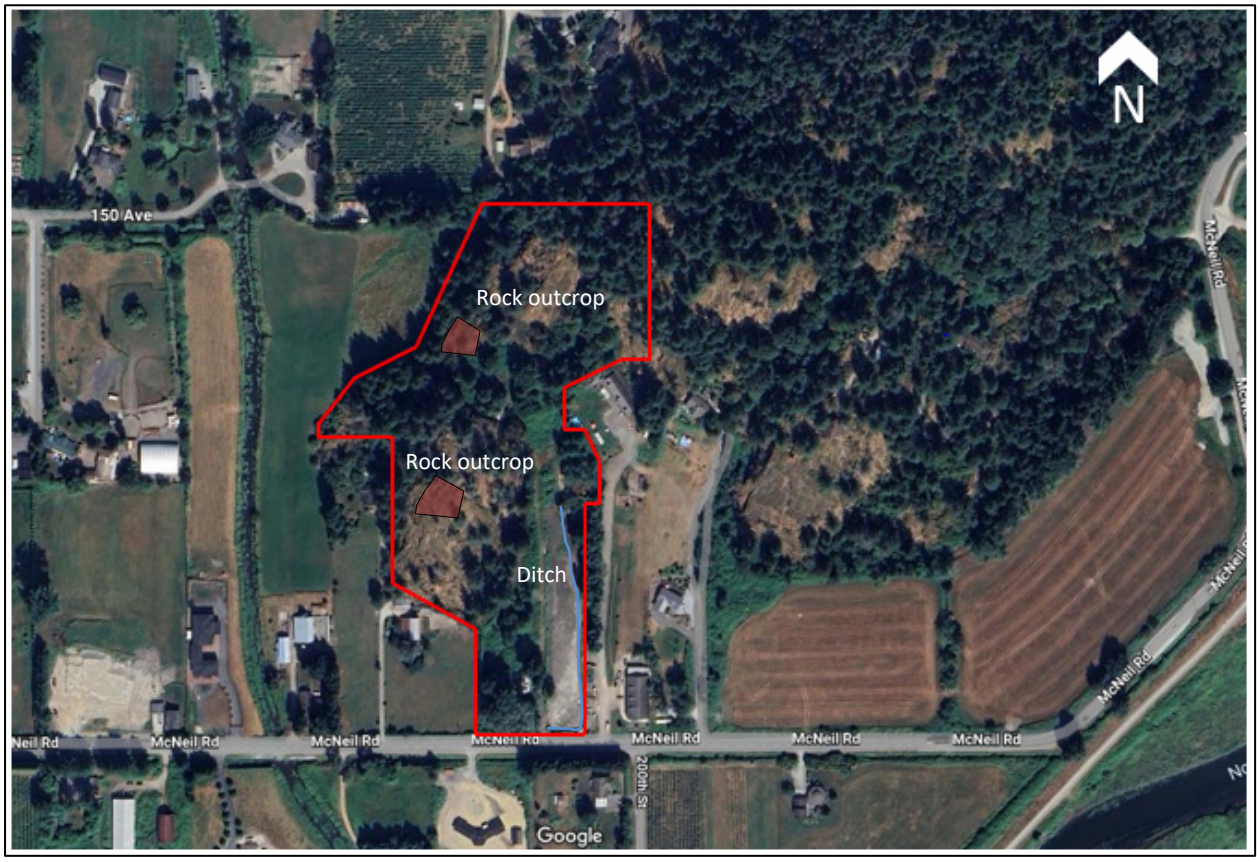


Figure 7. Mapped Locations of Unique Habitat Features.



8.1.1 Invasive Species

A single localized infestation of Japanese Knotweed (*Reynoutria japonica*) was observed along the southern site boundary near the abandoned garage at the base of the access road on McNeil Road. This infestation has the potential to spread rapidly if not adequately treated and managed and is listed as provincially 'noxious' per the BC *Weed Control Act*, which notes *'An occupier must control noxious weeds growing or located on land and premises, and on any other property located on land and premises, occupied by that person.'* Other observed invasive vegetation included Himalayan Blackberry (*Rubus discolor*), Herb Robert (*Geranium robertinanum*), Himalayan Balsam (*Impatiens glandulifera*), Lamium (*Lamium* sp.), and Reed Canarygrass (*Phalaris arundinacea*).

8.2 Wildlife

A summary of common and sensitive terrestrial wildlife or terrestrial wildlife signs (pellets, scat, tracks, etc.), if any, observed during the field surveys are outlined in the following sections.

8.2.1 Mammals

Direct mammal observation was limited to Eastern Grey Squirrel (*Sciurus carolinensis*), Douglas' Squirrel (*Tamiasciurus douglasii*), Black-tailed Deer, and American Black Bear (*Ursus americanus*) during the surveys conducted in 2022. In 2024, no mammals were directly observed on site. Indirect mammal signs included Black Bear scat, Coyote (*Canis latrans*) scat and Black-tailed Deer pellets, bedding areas, and tracks.

8.2.2 Birds

The following bird species were observed during the 2024 field surveys:

- Anna's Hummingbird (*Calypte anna*);
- American Crow (*Corvus brachyrhynchos*);
- American Goldfinch (Spinus tristis);
- American Robin (*Turdus migratorius*);
- Dark-eyed Junco (*Junco hyemalis*);
- House Finch (*Haemorhous mexicanus*);
- Pacific Wren (*Troglodytes pacificus*);
- Pine Siskin (*Spinus pinus*);
- Purple Finch (*Haemorhous purpureus*);
- Song Sparrow (*Melospiza melodia*);
- Spotted Towhee (*Pipilo maculatus*);
- Swainson's Thrush (*Catharus ustulatus*);
- Turkey Vulture (*Cathartes aura*);
- Western Flycatcher (*Empidonax difficilis*);
- Western Tanager (*Piranga ludoviciana*);
- Western Wood-pewee (*Contopus sordidulus*);
- White-crowned Sparrow (*Zonotrachia leucophrys*); and
- Yellow-rumped Warbler (*Setophaga coronata*).

There were no Olive-sided Flycatcher (*Contopus cooperi)* observations during the 2024 field survey (but were observed in the larger parcel in 2022). No raptor nests were identified during 2022 or 2024 field surveys.

8.2.3 Species-at-Risk

No direct or indirect observations of species at risk present on site at the time of field survey. A ranking of potential for provincially and federally listed rare and endangered species is provided in **Table 3.**

Table 3: Ranking Potential for Provincially and Federally-listed Rare and Endangered Species

Common and Scientific Names	Status[2]	Status[2]	Status[2]
MAMMALS			
Pacific Water Shrew *Sorex bendirii*	Red; EN	**LOW**	The Pacific Water Shrew requires riparian habitat including but not limited to dense wet forests, marshes, streams or bogs. Due to the limited water resources on site and the man-made ditch that becomes dry seasonally, the potential for utilization is deemed to be 'low',
Trowbridge's Shrew *Sorex trowbridgii*	Blue	**LOW**	This shrew species is more terrestrial relative to the Pacific Water Shrew, although it does frequent water. Due to the prevalence of coniferous and mixed forest, some suitable habitat may be present, although due to the lack of water on site, it is unlikely for this species to occur.
BIRDS			
Band-tailed Pigeon *Patagioenas fasciata*	Blue	**MODERATE - HIGH**	Prevalence of suitable berries present on-site and some coniferous forests provide favorable nesting potential.
Barn Swallow *Hirundo rustica*	Blue, TH	**HIGH**	Generally forages and nests in open areas. There is potential for suitable nesting habitat in the abandoned buildings and rock outcrops.
Common Nighthawk *Chordeiles minor*	TH	**MODERATE**	Utilizes a wide range of habitats including mountains and plains in open and semi-open habitats. Specific habitats include open forests, savannah, grasslands, fields, and areas around cities and towns. Given the variable habitat conditions, there is a potential for this species to occur.
Great Blue Heron *Ardea herodias* ssp. *Fannini*	Blue; SC	**MODERATE**	Due to the proximity of the North Alouette River and the Pitt River, and the variable habitat conditions on site, Great Blue Heron may utilize the site periodically but not expected to nest or appreciably forage on-site.
Olive-Sided Flycatcher *Contopus cooperi*	Blue; TH	**HIGH**	Suitable foraging and nesting habitats exist within the site area boundary. Species confirmed on the larger parcel during the 2022 parcel but not observed in 2024.
Western Screech-Owl *Megascops kennicottii* ssp. *Kennicottii*	Blue; SC	**MODERATE**	May occasionally roost and forage in forested areas. Site of a sufficient size to support this species. Preference given to larger tracts of contiguous, undisturbed areas away from developed areas.

Table 3: Ranking Potential for Provincially and Federally-listed Rare and Endangered Species

Common and Scientific Names	Status[2]	Status[2]	Status[2]
AMPHIBIANS AND REPTILES			
Northern Red-legged Frog *Rana aurora*	Blue; SC	**LOW**	This species is directly associated with streams, ponds and marshes although have been identified away from water sources in moist forests. The limited seasonal aquatic feature (ditch) likely precludes this species.
Western Toad *Anaxyrus boreas*	SC	**LOW**	The limited seasonal aquatic feature (ditch) and limited contiguous suitable habitat areas likely precludes this species.
Northern Rubber Boa *Charina bottae*	SC	**LOW - MODERATE**	May periodically utilize rocky outcrop areas which are present sporadically at the site.
INVERTEBRATES			
Dun Skipper *Euphyes vestries*	Blue; TH	**LOW - MODERATE**	Utilizes a wide variety of habitats including wetlands, fields, meadows, right-of-ways, etc.
Monarch *Danaus plexippus*	Blue; SC	**LOW**	Has been observed in low moist spots in fields, meadows, right of ways, etc., but typically prefers large tracts of undisturbed, natural habitat. Anthropogenic activities (habitat degradation, fragmentation and introduction of invasive species) are thought to be the primary reason for this species decline.
Oregon Forestsnail *Allogona townsendiana*	Red; EN	**LOW**	Some suitable habitat (Big-leaf Maple) within the site area. Did not identify Stinging Nettle during the field survey, which is commonly found alongside forestsnails.
Threaded Vertigo *Nearctula* sp.	Red, SC	**LOW**	Often found in moist deciduous and mixed wood forests at low elevations in areas dominated by Bigleaf Maple and ferns. Due to the lack of Bigleaf maple dominant forests, habitat is generally unsuitable.
PLANTS			
Streambank Lupine *Lupinus rivularis*	Red, EN	**LOW**	Often found along riverbanks and within open woods including natural riverbank habitats and gravelly railway beds and dykes. Aquatic habitats are generally unsuitable.
Vancouver Island Beggarticks *Bidens amplissima*	Red; EN	**LOW**	Often found in wetland and shoreline areas including ditches, wet fields and marshes as well as old riverbeds, pond margins, streamside and river edges. Marginally suitable species on-site.
Washington Springbeauty *Claytonia washingtoniana*	Red	**LOW**	Moist to mesic mossy rock outcrops and forests in the lowland and montane zones. Several rocky outcrops throughout the site which may provide suitable habitat for this species.
MOSSES			
Poor Pocket Moss *Fissidens pauperculus*	Red, EN	**LOW**	Found on bare, moist soil banks often growing with *Fissidens bryoides*. Observed on silty damp slopes or outcrops that are wet in winter and dry in summer shaded by Douglas-fir and Western Hemlock. Some suitable areas on-site.
Roell's Brotherella *Brotherella roellii*	Red	**LOW – MODERATE**	Forms mats on rotten logs, stumps and bases of trees in cool-to-moist mixed deciduous and conifer forests at low elevations along valley margins. Some suitable areas on-site.

[2] Federal status is SC = Special Concern; TH = Threatened; EN = Endangered.

8.3 Aquatic Habitats

8.3.1 Ditch Determination and Appropriate Setbacks per the Riparian Areas Protection Regulation

The ditch, oriented north-to-south within the southeast portion of the site is confirmed to be defined as a 'ditch', noting that is 100% man-made, does not consist of any natural headwaters or springs or natural hydraulic inputs, and is intended to drain properties. Additionally, fish sampling in 2022 did not yield any results. This was further confirmed in 2024 in which the ditch was dry and could not directly support fish or fish life processes. The site owner, in discussion with the neighbour, provided AquaTerra and the City of Pitt Meadows with correspondence that the decorative pond feature and drainage consist of recirculated water and do not discharge into the ditch on-site. As such, under the detailed Riparian Areas Protection Regulation (RAPR) methodology, a Streamside Protection & Enhancement Area (SPEA) of 2 m – for a constructed ditch with no fish presence, is deemed to be appropriate based on field survey observations, fish sampling results and information provided by the owner and adjacent, neighbouring land owner.

9 Environmental Impact Assessment

Valued Ecosystem Components (VECs) were identified and are discussed in the following sections. VECs are those attributes in the environment that are of particular importance due to their physical, ecological, resource-harvesting, and aesthetic. Each VEC was subjected to further analyses serving to quantify potential impacts, formulate site-specific mitigation measures, and assess for residual effects.

The relative significance of Project activities on each VEC was evaluated using the following criteria (EOA 2013):

- Context – current and future sensitivity and resilience of the Valued Component to change due to the project (low, moderate or high sensitivity);
- Magnitude - the effects of the impact on the VEC (low, medium, or high impact);
- Extent - area/volume covered, distribution (immediate, local, or regional area);
- Duration of impacts - short or long-term;
- Reversibility/irreversibility - the extent of recovery and length of time required to recover; and
- Frequency - intermittent or continuous.

The potential VECs were then assessed to determine the applicability to the Project. The applicable VECs that have been identified for the Project include:

- Terrestrial Wildlife, Sensitive Species and Associated Habitats – Section 9.1;
- Fish and Fish Habitat – Section 9.2;
- Surface Water Quality and Storm Water Run-off – Section 9.3;
- Air Quality – Section 9.4; and
- Noise – Section 9.5.

The mentioned VECs are discussed in detail in the following sections.

9.1 Terrestrial Wildlife, Sensitive Species, and Associated Habitat

The footprint of the development is situated within private property owned by BC Star Development in the City of Pitt Meadows. The 5-hectare property is primarily mature, second-growth mixed stands interspersed with rocky outcroppings. Invasive vegetation is generally localized and does not consist of noxious species with the exception of Japanese Knotweed within the southwestern portion of the site, which requires treatment to prevent the spread and establishment of this species (and resulting habitat degradation).

The southeastern area also contains an elongated rectangular agricultural field of approximately 0.75 hectares, dominated by Reed Canarygrass. Suitable habitat for a variety of species groups is present throughout the site, including invertebrates, mammals, birds, amphibians and reptiles, and native plant communities. A single ephemeral, ditched, watercourse with no headwaters bisects the southeastern field. The ditch was dry upon conducting the 2024 supplementary field survey. The ditch and the surrounding riparian zone will be retained by implementing buffer zones to ensure compliance with the *Riparian Areas Protection Act*. Specific potential impacts, mitigation measures, and residual effects relating to each species or species group are discussed in the following sections.

9.1.1 Potential Impacts to Invertebrates

Potential impacts to common soil invertebrates, including a barrier to movement, habitat loss and mortality, will occur within the site area as a result of development; however, these invertebrates are abundant in adjacent areas and are not anticipated to result in local population declines. Due to minimal wildflower presence and open areas for pollination, pollinator activity on-site is anticipated to be ‘low’. Flying invertebrates, such as bees and wasps (Order *Hymenoptera*),

dragonflies and damselflies (Order *Odonata*), butterflies and moths (Order *Lepidoptera*), are highly mobile and will be able to avoid the active construction area during construction works. A reduction in foraging habitat within disturbed areas may occur for flying invertebrates during the clearing and grubbing operations. During the operational phase, vehicular collisions with flying invertebrates will likely increase; however, there are potential habitat improvements for some pollinating species following landscaping activities and added flowers within the development.

9.1.2 Potential Impacts on Amphibians and Reptiles

While not observed in the supplementary field survey, an exotic Green Frog was observed on-site in 2022, denoting that amphibians that may utilize the site area, although with a 'low' potential (as denoted in **Table 3**) but may also seasonally include Pacific Chorus Frog (*Pseudacris regilla*). Reptile species with the potential to utilize the site are limited to Common Garter Snake, Western Terrestrial Garter Snake and Rubber Boa. Amphibians typically inhabit riparian areas and wetlands, while the aforementioned reptiles are habitat generalists, able to utilize the riparian areas, forest habitats, rocky outcroppings and grassy field found within the site. Any blasting of the rocky outcroppings along with clearing of these habitats or work in the vicinity of riparian corridors may result in loss in habitat for local amphibians and reptiles. Compromised water quality as a result of sedimentation or spills may also adversely affect the local populations. Similarly, dispersing adults may enter the active construction area without the implementation of mitigation measures to isolate habitat areas.

9.1.3 Potential Impacts to Birds

Foraging habitat will be lost for certain common bird species as a result of development. Suitable habitat is present in adjacent areas providing refuge for local species. Construction activities (e.g., blasting), may result in some sensory disturbance to birds nesting and utilizing undisturbed adjacent habitats. Most small birds readily habituate to human noise and activity; therefore, the reduced habitat effectiveness from sensory disturbance is considered to be 'low'. Some larger bird species such as raptors are more susceptible to sensory disturbance (MFLNRO 2013), therefore, construction activities will be limited to appropriate timing to coincide with raptor nesting windows, and raptor nest surveys will be completed to reduce disturbance to nesting raptors. During the operational phase, road use will increase bird/vehicle collisions; however, a lower speed limit would serve to reduce the mortality rates. Habitat degradation, as a result of invasive species spread and establishment, may occur in the absence of appropriate mitigation.

9.1.4. Potential Impacts to Mammals

Potential impacts to mammals include the following:

- Bear / Human and Garbage interactions;
- Coyote / Human and Garbage interactions;
- Deer / Human interactions;
- Loss of small and large mammal foraging and hunting habitat;
- Habitat degradation due to spread and establishment of invasive species; and
- Mammal sensory disturbance.

The significance of localized impacts of habitat loss is considered to be 'low' for small mammals such as Douglas Squirrel (*Tamiasciurus douglasii*), Townsend's Vole (*Microtus townsendii*) and Deer Mouse (*Peromyscus* sp.), which are likely to occupy the development area. These species are common in the area and abundant habitat is available to support them in adjacent areas. During the construction phase, small mammals are anticipated to migrate to adjacent areas and will be generally avoided by larger mammals. Short-term sensory disturbance (i.e., during blasting activities, if any) may occur, which is also anticipated to result in avoidance. The impact on large mammals such as Black-tailed Deer, Black Bear, and Coyote, likely to utilize the area as a wildlife corridor and foraging, is of 'low-to-moderate' significance on a local scale as the development and driveway accesses may marginally limit movement, noting that the internal residential access is of smaller scale and is expected to have low vehicular traffic volume. Development of the site will reduce foraging opportunities for large mammals, though due to the site being surrounded on the south, east, and west by residences and farmland, it is unlikely the proposed development will have a notable impact on the movements of large mammals.

9.1.5. Potential Impacts to Species at Risk

Potential impacts to selective and representative species at risk, including those with a moderate and/or high potential to occur on-site are summarized in the following sections.

9.1.5.1 Pacific Water Shrew

Historical documentation of the Pacific Water Shrew has been identified within watercourses connecting to Fenton Slough and the North Alouette River, and there is potential for their habitat to be associated with the ephemeral ditch; however the potential is deemed to be 'low' per **Table 3**. Specifically, due to the limited water resources on site and the man-made ditch that becomes dry seasonally, the potential for utilization is deemed to be 'low'. Pacific Water Shrew prefer

forested habitat with intact riparian areas and associated watercourses that convey flow year round as much of their foraging is conducted within aquatic areas. The ditch on-site does not confer suitable foraging habitat. Indirect impacts to Pacific Water Shrew, if any, may include a reduction in water quality (i.e., sedimentation, spills, etc.) if works occur while the ditch contains water, affecting foraging ability and survival. Incidental mortality may also occur if individuals venture into the active construction area without the implementation of mitigation measures to isolate associated habitat areas. Increased vehicle strikes during operations may also occur.

9.1.5.2 Trowbridge's Shrew

Mitigation measures largely mirror those established for Pacific Water Shrew (Section 9.1.5.1), though it tends frequently both dry and moist mature forest ecosystems.

9.1.5.3 Band-tailed Pigeon

Impacts on Band-tailed Pigeon populations are likely to be 'low', as their preferred habitat includes anthropogenic mineral sites and deciduous regrowth, while the site is primarily dominated by conifers. Blasting of rocky outcroppings could reduce the forage potential of berries found on herbs found on the outcroppings; however, berry producing shrubs on-site are generally of low abundance and are present for a limited time each year. Band-tailed pigeons utilize coniferous forests as breeding sites, which are generally avoided through retention of the coniferous areas on-site as part of the ALR buffer.

9.1.5.4 Barn Swallow

Barn Swallows often use structures such as the rocky outcroppings or buildings and forage over open areas, often in close proximity to water. The assessments completed in 2022 and 2024 did not identify any Barn Swallows on-site. Removal of the buildings or blasting of the outcroppings have the potential to impact potential nesting sites, if present. They commonly forage in open areas for insects on the ground or vegetation, and both clearing of the herbaceous field and development within open areas have a potential to reduce the forage potential. Given the abundance of higher suitable agricultural areas off-site, and open areas above watercourses and sloughs in the regional area, the potential impacts to Barn Swallow are anticipated to be 'low', noting a bird nest survey, including any structures to be removed, shall be required prior to the onset of work.

9.1.5.5 Common Nighthawk

Common Nighthawks primarily forage for insects and the removal of open areas, including

clearing and grading of the herbaceous field and blasting of the rocky outcroppings, would reduce their ability to forage. Alteration of the field, blasting of the rocky outcroppings, or demolition of the abandoned buildings have the potential to adversely affected nesting habitat, as Common Nighthawks often nest in bare sites in open areas and occasionally on the roofs of buildings. Suitable roosting sites include the ground, rooftops, and tree limbs noting a bird nest survey, including any structures to be removed, shall be required prior to the onset of work.

9.1.5.6 Great Blue Heron

No suitable foraging habitat was observed within the site area boundaries, and no nesting was observed on-site or within 500 m of the site. With an abundance of higher sutiabililty foraging habitat observed along the Alouette River, site development is not anticipated to result in impacts to this species, which require aquatic resources and fish/wildlife for foraging. Blasting or excessive noise can disrupt heron colonies and should not be performed within 1000 m during the nesting window in the absence of mitigation (e.g., blast mats) and/or appropriate environmental monitoring. The most recent year for rookery activity within 1000 m of the site was 1997 for GBHE-208-007, being situated approximately 500 m from the site.

9.1.5.7 Olive-sided Flycatcher

Observations of the Olive-sided Flycatcher in 2022 for the larger Sheridan Hill property indicate that the species is present within the local area. While not a priority of focused studies in BC, development may result in potential impacts to the species that inhabit the area. Loss of foraging and nesting habitat due to clearing and grubbing may occur, although, with similar habitat in the immediate area, minor impacts are anticipated with the appropriate mitigation measures in place which shall include bird nest surveys prior to the onset of clearing works and construction activities within the prescribed nesting period.

9.1.5.8 Western Screech Owl

Along the West Coast, the Western Screech Owl can be found in moist coniferous forests and woodlands situated near waterbodies and are often found in rural areas. Clearing and grubbing of the Western Redcedar habitat within the site reduces the amount of habitat available for this species. The Western Redcedar habitat bordering the field provides a suitable vantage point for the Western Screech Owl to roost and scout for prey. Mitigation measures for this species include mapping and delineating mature Western Redcedar dominated forests and concentrating development away from these core areas, which is to remain within the 30 m ALR buffer. Western

Screech Owl are not anticipated to utilize open mixed forest, deciduous woods or regenerating forest areas, nor the open lowland areas.

9.1.5.9 Northern Red-legged Frog

The potential for this species occurrence on-site is anticipated to be 'low'. Potential impacts largely mirror those described in Section 9.1.5.1 for Pacific Water Shrew as habitat utilization is similar; however, given the limited mobility of larval individuals and permeable skin of adults, the introduction of deleterious substances into waterbodies adjacent to the project area footprint as a result of sedimentation or spills has the potential to directly impact local Red-legged Frogs in the absence of appropriate mitigation. Northern Red-legged Frogs often breed ephemeral waterbodies; however the ditch on-site is not anticipated to retain sufficient water to be utilized by this species. As a precautionary measure, maintaining a ditch setback maintaining vegetation are proposed to ensure maintained habitat utilization and function.

9.1.5.10 Northern Rubber Boa

Use of habitats in BC is not well known, however they often associate with rocky outcroppings, crevices, and rock piles, and where they den or bask in the sun. Impacts to rocky habitats have severe impacts on Rubber Boa populations. There is also potential association with the low-lying field, as Rubber Boa will utilize habitats with loose soil or previous burrows. Destruction of habitat through blasting of rocky outcroppings or clearing of the agricultural field may cause incidental mortality and subsequently reduce available habitat for the species. Prior to blasting, if any, AquaTerra proposes to conducted pre-blasting surveys and salvage any reptiles observed, outside of the active work area.

9.1.5.11 Western Toad

The potential for this species occurrence on-site is anticipated to be 'low'. Potential impacts largely mirror those described in Section 9.5.1.3 for Northern Red-Legged Frog, though the Western Toad is more likely to further utilize inland terrestrial habitat such as moist forests.

A general summary of the significance of potential impacts on Terrestrial Wildlife, Sensitive Species, and Associated Habitats (prior to implementation of mitigation measures) is provided in **Table 4**.

Table 4. Relative Significance of the Potential Impacts on Terrestrial Wildlife, Sensitive Species, and Associated Habitats.

Project Component	**Evaluation Criteria**						
	Context	**Magnitude**	**Extent**	**Duration**	**Timing**	**Reversibility**	**Frequency**
Construction Phase							
Clearing and Grubbing	high	high	local	long-term	immediate	irreversible	continuous
Soil Stripping	moderate	low-high	local	long-term	immediate	irreversible	continuous
Cut Excavation and Rock Excavation / Blasting	moderate	medium	local	long-term	immediate	irreversible	continuous
Road Pre-construction and Fill Placement	low	medium	immediate area	long-term	immediate	irreversible	continuous
Utility, Fencing and Infrastructure Access Construction	low	low	immediate area	long-term	immediate	irreversible	continuous
Road Paving	low	low	immediate area	long-term	immediate	irreversible	continuous
Development construction	moderate	low	local	long-term	Immediate/ delayed	irreversible	continuous
Operational Phase							
Active Residential Community	moderate	medium	local	long-term	immediate/ delayed	irreversible	continuous
Safety / Environmental and Human Health							
Construction Equipment Spills	low	low	local	short-term	immediate/ delayed	reversible	intermittent
Construction Debris	low	low	immediate area	short-term	immediate/ delayed	reversible	intermittent
Accidents & Malfunctions	low	low	immediate area/ local	short-term	immediate/ delayed	reversible	intermittent

n/a - not applicable

Although impacts to the immediate and local areas will occur, impacts on a regional level are considered to be of 'low' significance. Impacts to wildlife, sensitive species, and associated

habitats can be effectively mitigated through the implementation of applicable mitigation measures, outlined in the following sections.

9.1.6 Mitigation Measures for Invertebrates

General mitigation measures to be protective of invertebrate populations are provided below:

1. Implement the 30 m vegetated buffer ALR offset, as proposed, to provide contiguous habitat and a wildlife movement corridor;
2. Maximize the retention of forested areas, where possible;
3. Delineate areas to be left undisturbed to prevent encroachment during construction;
4. Restrict heavy machinery and vehicles in potential habitat areas;
5. Prevent the spread of invasive species via limiting soil exposure and anthropogenic activities within the leave areas. Treatment of the Japanese Knotweed infestation is required and should be implemented as soon as possible, with repeat treatment and follow-up for a minimum of two (2) growing seasons;
6. Strictly manage construction waste and pollutants to prevent contamination. Develop and implement a site-specific emergency response plan to contain and clean up accidental spills safely and quickly;
7. Utilize mechanical clearing methods (as opposed to herbicides) for construction activities;
8. Avoid clearing during spring (March – June) when gastropods are most active on the surface and may be depositing eggs;
9. Avoid altering natural drainage patterns. Retention of drainage courses and groundwater levels will play a key role in maintaining moist forest floor conditions and herbaceous vegetation required by many invertebrate species;
10. Avoid brush burning, as certain gastropod species are intolerant to burning; and
11. Limit habitat disruption activities within riparian areas. Specifically, retain coarse woody debris, including large-diameter downed logs, on the forest floor.

9.1.7 Mitigation Measures for Amphibians and Reptiles

The following mitigation measures should be implemented to minimize the impacts to amphibians and reptiles:

1. Implement the 30 m vegetated buffer ALR offset, as proposed, to provide contiguous habitat and a wildlife movement corridor;
2. Perform construction work within amphibian and reptile habitats outside the amphibian breeding window (late winter – summer [February to early July]);
3. Conduct precautionary wildlife sweeps / salvages prior to the onset of works in areas that may be inhabited by these species (e.g., reptiles in areas dominated by rocky outcroppings);
4. Treatment of the Japanese Knotweed infestation is required and should be implemented as soon as possible, with repeat treatment and follow-up for a minimum of two (2) growing seasons;
5. Where construction work is to occur within the breeding window or where construction works may impact amphibian and reptile populations, conduct a salvage immediately prior to the onset of works;
6. Delineate and flag potential breeding and resident amphibian and reptile habitat areas that may potentially be impacted by construction. Results will be reviewed and acknowledged by the awarded construction contractor and integrated into their Construction Environmental Management Plan (CEMP);
7. Cover open trenches over night to prevent amphibian and reptile injury / entrapment;
8. To mitigate potential impacts, review BMPs for Amphibians and Reptiles in Urban and Rural Environments in British Columbia (Ovaska et al. 2014) and incorporate into CEMP, as needed;
9. Prevent sediment laden water from discharging directly into potential amphibian breeding habitat; and
10. Perform environmental monitoring, as required.

9.1.8 Mitigation Measures for Birds

The following mitigation measures should be implemented to minimize the impacts to birds:

1. Implement the 30 m vegetated buffer ALR offset, as proposed, to provide contiguous habitat and a wildlife movement corridor;
2. To avoid undue impacts to nesting birds, do not remove or alter vegetation during the sensitive breeding period between March 01 and August 31. Disturbance or destruction of

nesting birds contravenes Section 35 of the *Wildlife Act* and the *Migratory Birds Convention Act.* If land-clearing is necessary within this window, proceed only once a breeding bird nest survey has been conducted immediately prior to land-clearing activities to ensure that nesting or breeding wildlife impacts are assessed. Guidelines to avoid harm to Migratory Birds provided by Environment and Climate Change Canada (ECCC) should be followed to ensure proper management techniques are being utilized.

3. Where tree removal is required, give consideration to tree topping or girdling to create wildlife trees, instead of removing them entirely, where feasible;
4. If active raptor nests are found, implement applicable buffer zones and develop management and monitoring plans to reduce sensory disturbance until chicks have fledged. Refer to document entitled: Best Management Practices for Raptor Conservation during Urban and Rural Land Development in British Columbia (MOE 2005) for applicable set-backs and recommendations;
5. Post and enforce speed limit frequently to reduce road-related bird mortality;
6. Do not chip or transport invasive species;
7. Importation of soil for cut and fill activities should not be contaminated with invasive plant seeds or roots;
8. All disturbed areas should be re-seeded with native seed mixes or planted with native shrubs as soon as possible after disturbance to prevent the establishment of invasive species;
9. Treatment of the Japanese Knotweed infestation is required and should be implemented as soon as possible, with repeat treatment and follow-up for a minimum of two (2) growing seasons;
10. If blasting occurs, consider the drill-and-shoot method or smaller charges to reduce the amount of noise produced; and
11. If blasting occurs, consider blast mats during blasting to reduce the noise produced.

9.1.9 Mitigation Measures for Mammals

1. Maintain vegetated wildlife corridors / habitat linkages through the site, with a preference for a minimum vegetated width of 20 m to facilitate wildlife movement north to south and east to west of the site. This is anticipated to be achieved via the proposed 30 m ALR offset boundary along the western site boundary. Reducing / limiting fencing between properties and access routes / corridors between properties can provide habitat linkages through the site in an east-west direction. This east-west linkage is anticipated to be feasible given the large parcel size.
2. Destruction of breeding wildlife contravenes Section 35 of the *Wildlife Act*. If land-clearing is necessary within this window, proceed only once a survey of the site has been conducted to ensure that breeding wildlife impacts are adequately assessed;
3. Where tree removal is required, give consideration to tree topping or girdling to create wildlife trees, instead of removing them entirely, where feasible;
4. Treatment of the Japanese Knotweed infestation is required and should be implemented as soon as possible, with repeat treatment and follow-up for a minimum of two (2) growing seasons;
5. Implement an effective garbage management system during construction, which may include the use of locking / secure wildlife-proof garbage cans, with the option to relocate refuse to a secure on-site facility for temporary storage prior to weekly off-site disposal;
6. Monitor wildlife / human interactions and implement mitigation measures, as required;
7. Work with wildlife biologists to minimize impacts to mammal populations and address human interaction issues;
8. If blasting occurs, consider drill-and-shoot method or smaller charges to reduce the amount of noise produced;
9. If blasting occurs, consider blast-mats during blasting to reduce noise produced; and
10. Post and enforce speed limit frequently to reduce road-related mammal mortality.

9.1.10 Mitigation Measures for Species at Risk

9.1.10.1 Pacific Water Shrew

The potential for this species to occur on-site is deemed to be 'low'. Mitigation measures are only required if habitat conditions change or are deemed to be suitable by a professional biologist

based on site conditions prior to the onset of construction. Potential mitigation includes:

1. Adhering to the 2008 BMP Guidelines for Pacific Water Shrew in Urban and Rural Areas [Working Draft] (Craig and Vennesland 2010);
2. Having a qualified professional biologist evaluate for the potential of Pacific Water Shrew habitat areas and delineate / designate them as a 'no-go' zone, if required. Isolate these areas from the active work area via the installation of trenched silt/exclusion fencing, if deemed appropriate;
3. Conducting construction activities so as to maximize habitat connectivity and provide refuge habitat during construction, where possible;
4. Minimizing clearing and grubbing, where possible, to reduce direct habitat loss or fragmentation;
5. Developing and implementing a protocol to manage the handling and storage of construction waste (e.g., uncured concrete) and fueling and maintenance (e.g., hydraulic oils/lubricants) materials to prevent potential contamination of adjacent habitat areas. Implement a site-specific emergency response plan (e.g., parking construction machinery over spill pads) to contain and clean up accidental spills safely and quickly; and
6. Limiting construction use within habitat areas by installing long-term barriers/access constraints to prevent degradation of habitats.

9.1.10.2 Trowbridge's Shrew

Mitigation measures largely mirror those established for Pacific Water Shrew (Section 9.1.10.1).

9.1.10.3 Band-tailed Pigeon, Barn Swallow, Common Nighthawk and Olive-sided Flycatcher

Project-specific applicable mitigation measures for these species are:

1. Avoid disturbing active and non-active nests from 01 March to 31 August, especially the nest site and territorial areas, but also surrounding habitats used for foraging, nest building, and drinking. A songbird nesting survey (SBNS) is required prior to any onset of vegetation removal during this period to evaluate/identify active nests and implement appropriate buffers;
2. Avoid maintenance activities of nest structures [e.g. barns, sheds, bridges] during the breeding season;

3. Avoid the use of insecticides and herbicides whenever possible;
4. Retain existing nest structures and access to them during the breeding season;
5. Conserve valuable habitats, such as wetlands, native and grazed grasslands, and hedgerows; and
6. Maintain grazed pastures close to nest structures/colonies to sustain higher aerial invertebrate densities close to preferred Barn Swallow foraging areas, especially where surrounding agricultural land use is intensive.

9.1.10.4 Great Blue Heron

Mitigation measures for Great Blue Heron are only applicable of the closest rookery is deemed active, which can be assessed prior to the onset of construction. If active, construction must follow the guidelines provided in *Develop With Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (Cullington, 2014). **As noted above, these mitigation measures are only applicable if it is deemed that the historical rookery near the site is active**, and are as follows:

- If active, note that rookeries can include nesting activity between January 15 to September 15; however, in AquaTerra's experience, activity is typically first observed in late February/Early March and is typically complete by mid-late July. A site specific window would be established by a biologist based on field observations/monitoring prior to the onset of works and periodically as work progresses;
- The Province recommends a buffer of at least 300 m in undeveloped areas, 200 m in rural areas, and 60 m in urbanized areas. An additional 200-meter 'no disturbance' buffer is recommended during the nesting season, especially for colonies not previously accustomed to people and their activities;
- Blasting or similarly excessive noises should not occur closer than 1000 m from a colony during the nesting window in the absence of environmental monitoring and mitigation (e.g., blast mats);
- Design and locate developments to avoid disturbing heronries and feeding areas. Talk to the local government about ways to concentrate development in areas with lower environmental values;
- Time construction carefully. Avoid any new disturbance between January 15 and September 15 when herons are nesting. Early in the season, herons are particularly susceptible to disturbance;
- Protect feeding and perching areas. Avoid draining or filling wetlands or coastal marshes,

and maintain shoreline habitats in a natural condition. Protect communal roosting (perching) sites such as jetties, log booms, and coniferous trees; and

- Check with your local government to see if they have a Development Permit Area (DPA) or other bylaw that protects nest trees and buffer zones in your area.

9.1.10.5 Western Screech Owl

Mitigation measures for the Western Screech Owl must follow the guidelines provided in *Develop With Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (Cullington, 2014) and *Guidelines for Raptor Conservation During Urban and Rural Land Development in British Columbia (2013).* The development guidelines are as follows:

1. Conduct a pre-clearing / pre-construction survey to evaluate the potential for Western Screech Owl and/or nests within the project area;
2. Protect identified nest sites. Leave a protective buffer around active nests of at least 1.5 tree lengths in urban areas and 200 m in rural areas. An additional 200 m 'no disturbance' buffer is recommended during the breeding season (March 15–August 31), when the female and nestlings are even more susceptible to human disturbance;
3. Retain existing habitats and features. Preserve any trees or snags with cavities that could be used by Western Screech Owls for nesting. Protection of dead and dying trees is particularly important, as woodpeckers use these to create nest cavities which can later be used by Western Screech Owls and many other wildlife species. Look for opportunities to protect buffered nests that are close to continuous forested patches, of sufficient size (5–30 ha), that will provide essential feeding, nesting, and roosting habitat for screech owls. Protected forest patches should be surrounded by a 100 m vegetated buffer that provides a suitable foraging habitat;
4. Restore the availability of nest cavities. Replace any nest cavities that were damaged or lost with suitable nest boxes. Although they are not an ideal substitute for natural cavities, nest boxes can provide nesting and roosting sites for Western Screech Owls; and
5. Protect roost and perch sites. Protect trees, snags, and other structures where Western Screech Owls are regularly observed perching or roosting.

9.1.10.6 Sensitive Amphibians & Reptiles

Mitigation measures for must follow the guidelines provided *in Develop With Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (Cullington,

2014) and *Guidelines for Amphibian and Reptile Conservation During Urban and Rural Development in British Columbia (2014)*.

Given that Red-legged Frogs may occur up to 200-300 m from a waterbody (Nussbaum et al. 1983), a salvage (will require a salvage permit, which should be obtained well in advance of construction) may be required depending on seasonality, presence of water and scope of work in the vicinity of the ditch and surrounding area. The salvage methodology, if required, should consist of an active search methodology, consisting of 1-2 surveyors, covering an area of approximately 1 ha hr^{-1}. The salvage timing window should be associated with higher activity levels (i.e., late March to late October) to be effective. Amphibians identified during the active searches will be captured manually or through use of hand-held nets and relocated to suitable habitats set well outside the Site boundary in consultation with MOE. Other mitigation measures include:

1. Do not allow sediment and runoff from construction sites to enter nearby watercourses.
2. Protect and connect breeding and hibernating habitats.
3. Maintain adjacent habitat in as natural a condition as possible.
4. Preserve essential habitat features (e.g., coarse woody debris, rodent burrows)
5. Protect nesting sites and foraging habitats from trampling, recreation, and human persecution.

9.1.11 Residual Effects

Residual effects include the permanent loss of terrestrial habitat within the development footprint, which includes road construction throughout the development, but also consists of deciduous and mixed-forest areas outside of the development. The effects will be realized within the immediate area but are not significant at a local or regional level as similar habitat types exist throughout the region. Some habitat retention, particularly of the identified red-listed ecosystem, should be incorporated using wildlife corridors in the north-south and east-west directions, along with the incorporation of ‘Protected Natural Areas and Greenways’ throughout the development. This is anticipated to be achieved via the proposed 30 m ALR offset boundary along the western site boundary. As such, no significant residual effects due to increased mortality of wildlife or sensitive species are anticipated if the recommended mitigation measures are implemented as intended.

9.1.12 Terrestrial Wildlife, Sensitive Species, and Associated Habitat - Section Summary

Potential Impacts, associated mitigation measures to minimize the potential impacts to terrestrial wildlife, sensitive species, and associated habitats as well as anticipated residual effects, if any, are summarized in **Table 5**.

Table 5. Summary of Potential Impacts, Corresponding Mitigation Measures and Residual Effects Associated with Proposed Project Works on Terrestrial Wildlife, Sensitive Species, and Associated Habitats

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
Construction Phase			
Clearing and Grubbing	Disturbances from construction activities	Delineate work area and install exclusion fencing to prevent encroachment to adjacent areas Minimize clearing area Conduct breeding bird nest surveys for clearing within the nesting window (March 01 – August 31) Adhere to applicable BMPs and timing windows Conduct pre-clearing surveys to identify / delineate areas occupied by sensitive species Evaluate for the potential for species at risk Avoid the use of pesticides and herbicides Conduct pre-clearing salvages for species where direct impacts may occur Do not chip or transport invasive species Re-vegetate as soon as possible to prevent spread of invasive species Conduct periodic environmental monitoring, as required	Habitat loss realized within the immediate area of the Project footprint. Not significant at the local or regional levels
Soil Stripping	Potential mobilization of sediments and concurrent reduction in water quality	Design and implement a Sediment and Erosion control plan to prevent sedimentation to downstream areas. May include the use of trenched silt fencing, filter socks, check dams, erosion control blankets or sediment retention ponds, as required Undertake salvages for species where direct impacts may occur	Habitat loss realized within the immediate area of the Project footprint. Not significant at the local or regional levels

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
		Conduct periodic environmental monitoring, as required	
Cut Excavation and Rock Excavation / Blasting	Auditory disturbance Potential Mortality	Consider drill-and-shoot method or smaller charges to reduce the amount of noise produced Consider use of blast-mats to reduce noise produced Conduct pre-clearing surveys to identify / delineate areas occupied by sensitive species Ensure work area is isolated to prevent animals from entering the active construction zone Conduct periodic environmental monitoring and noise monitoring during blasting activities to establish noise levels	Habitat loss realized within the immediate area of the Project footprint. Not significant at the local or regional levels
Road Pre-construction and Fill Placement	Potential mortality	Isolate work area prior to commencement of construction Design and implement a Sediment and Erosion control plan to prevent sedimentation to downstream areas. May include the use of trenched silt fencing, filter socks, check dams, erosion control blankets or sediment retention ponds, as required Conduct periodic environmental monitoring, as required	Minimal significance
Utility, Fencing and Infrastructure Access Construction	Potential mortality	Isolate work area prior to the onset of construction	Not significant
Road Paving	Potential mortality	Isolate work area prior to the onset of construction	Not significant
Operational Phase			
Active Residential Community	Potential mortality	Monitor roadkill along road and implement additional mitigation measures, if necessary	Not significant
Safety / Environmental and Human Health			
Construction Equipment Spills	Potential mortality	Implement and adhere to an Emergency Spill Response Plan Ensure that adequate spill containment materials are available within the Site Store CO_2 canisters and diffusers on-site in case of concrete spill	Not significant
Construction Debris	Potential mortality Reduced biological function or habitat	Strictly manage construction wastes, pollutants and storm water run-off Remove construction wastes from	Not significant

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
	impairment	the Site on a regular basis, and as soon as possible Fence-off / isolate & cover debris / stockpiles	
Accidents & Malfunctions	Potential impacts to survival Deleterious discharges	Prepare and adhere to a Project-specific CEMP	Not significant

9.2 Fish and Fish Habitat

Construction of the 19963 McNeil Lands development will require work in and around one (1) seasonal man-made ditch throughout the proposed development. This man-made ditch has seasonal discharge connectivity to the ditches along McNeil Road, which in turn have connectivity to the Pitt River; however this ditch is not anticipated to be accessible to fish. As noted by the client, ditch drainage discharges into the McNeil Road roadside ditch and is conveyed westward to the slough, continuing northward with discharge via a pumpstation at the Pitt River. While the ditch was dry during the 05 July 2024 inspection of the site, it is anticipated to provide seasonal food/nutrient inputs to fish habitat. Under RAPR, this man-made ditch is anticipated to require a 2 m setback.

9.2.1 Potential Impacts

Direct impacts to fish and fish habitat include proposed modifications to the watercourse within the Site to accommodate the Project development and access road construction, which are summarized in **Table 6.**

Table 6. Watercourse Identifier, Existing Features and Proposed Watercourse Modifications to Accommodate the Stream Crossings Associated with the Project Development.

Watercourse Identifier	Existing Features	Proposed Modification
North-to South man-man ditch within the eastern section of the herbaceous field	• Linear channel which progressively deepens further south • 100% organic substrate • No headwaters, no natural inputs • 100% man-made • Dense vegetation consisting of invasive riparian species (Reed Canary Grass, Himalayan Blackberry)	• Provide a 2-meter Streamside Protection & Enhancement Area (SPEA) – vegetated buffer - as a non-fish bearing ditch as part of the proposed development. • Implement erosion and sediment control measures. • Re-vegetate with native riparian species.

Indirect impacts to downstream fish populations prior to the implementation of mitigation measures may include:

- Sediment and erosion concerns during clear and grub, cut-and-fill, and excavation activities;
- Loss of in-stream and adjacent riparian habitats in areas requiring culverting or drainage blanket installation within the proposed road crossing locations;
- Potential for deleterious substances (e.g., road run-off, construction spills etc.) to enter

tributaries during construction;

- Increased anthropogenic influence (i.e. recreational activity) riparian areas; and
- Increased localized colonization and spreading of invasive plant species in riparian areas.

A summary of the significance of potential impacts on Fish and Fish Habitat (prior to implementation of mitigation measures) is provided in **Table 7**.

Table 7. Relative Significance of the Potential Impacts on Fish and Fish Habitat

Project Component	**Evaluation Criteria**						
	Context	**Magnitude**	**Extent**	**Duration**	**Timing**	**Reversibility**	**Frequency**
Construction Phase							
Clearing and Grubbing	moderate	low-moderate	local	long-term	immediate	irreversible	continuous
Soil Stripping	low	low-moderate	local	long-term	immediate	irreversible	continuous
Cut Excavation and Rock Excavation / Blasting	low	low	local	long-term	immediate	irreversible	continuous
Road Pre-construction and Fill Placement	moderate	moderate	immediate	long-term	immediate	irreversible	continuous
Road Construction / Retrofit and Installation of Culverts	high	moderate	local	long-term	immediate/ delayed	irreversible	continuous
Utility, Fencing and Infrastructure Access Construction	moderate	low	immediate	long-term	immediate	reversible	continuous
Road Paving	low	low	immediate	long-term	immediate	irreversible	continuous
Development construction	moderate	moderate	local	long-term	immediate/ delayed	irreversible	continuous
Operational Phase							

Project Component	Evaluation Criteria						
	Context	**Magnitude**	**Extent**	**Duration**	**Timing**	**Reversibility**	**Frequency**
Active Residential Community	moderate	medium	local	long-term	immediate/ delayed	irreversible	continuous
Safety / Environmental and Human Health							
Construction Equipment Spills	low-high	low	local	short-term	immediate/ delayed	reversible	intermittent
Construction Debris	low	low	immediate area	short-term	immediate/ delayed	reversible	intermittent
Accidents & Malfunctions	low	low	immediate area/ local	short-term	immediate/ delayed	reversible	intermittent

9.2.2 Mitigation Measures

To mitigate disturbances, no work in or about fish or fish habitat will occur outside the Reduced Risk In-stream Work Window for the Lower Mainland between August 1 and September 15 (MOE 2006), unless authorized by DFO. If possible, work would also occur when the ditch is dry. Other proposed measures include:

- Familiarize construction personnel with *DFO Land Development Guidelines for the Protection of Aquatic Habitat* (Chilibeck et al. 1993);
- Familiarize and adhere to *Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (Polster, D. and J. Cullington. 2006);
- Establish, flag, and demarcate a 2 m Streamside Protection & Enhancement Area (SPEA) and install snow fencing during construction and permanent fencing following construction to prevent encroachment;
- Minimize disturbances to riparian areas outside the proposed alignment area;
- Conduct works in the dry, where possible;
- Install trenched silt-fencing or filter socks along the toe of the slope in the active work area in close proximity to watercourses;

- If groundwater is encountered during construction activities (excavation), prevent turbid water from entering tributaries;
- Do not pump water from poured concrete foundations into aquatic habitats noting that elevated pH as a result of concrete residue can adversely impact aquatic inhabitants;
- Prior to accessing riparian areas, verify that machinery used is in good working condition and free of fuel and lubricant leaks. Necessary maintenance oils/lubricants are to be stored in a separate, contained lay-down area, and should be conducted well away from any drainage course / ditch (> 15 m);
- Implement BMPs outlined in the abovementioned documents to prevent sedimentation and erosional impacts when working in the vicinity of the watercourses;
- Dispose of waste materials by applicable regulations at licensed facilities;
- As a precaution, ensure that spill-containment kits containing sufficient quantities of absorbent materials are present in the active work area close to working machinery;
- Ensure that fueling of machinery is more than 15 m from tributaries/drainage features;
- Park construction machinery on spill pads over 15 m from drainage crossings/ditches;
- Re-plant in disturbed riparian areas. Re-seed all disturbed areas with native seed mixes or plant with native shrubs as soon as possible after disturbance to prevent the establishment of invasive species;
- Submit applicable provincial documentation for any potential instream works – e.g., culvert crossings spanning ditches etc.; and
- Ensure that an environmental monitor is on-site for in-stream works (if wetted) and conduct periodic water quality testing to confirm appropriate mitigation measures are being implemented.

9.2.3 Fish and Fish Habitat - Section Summary

Disruption to fish habitat should be minimal, however it can be minimized further if the discussed mitigation measures are implemented. Potential Impacts and associated mitigation measures to minimize the potential impacts to fish and fish habitat, are summarized in **Table 8**.

Table 8. Summary of Potential Impacts, Corresponding Mitigation Measures and Residual Effects Associated with Proposed Project Works on Fish and Fish Habitat

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
Construction Phase			
Clearing and Grubbing	Reduction in water quality as a result of mobilization of sediment and erosion Loss of riparian vegetation	Design and implement a Sediment and Erosion control plan to prevent sedimentation to downstream areas. May include the use of trenched silt fencing, filter socks, check dams, erosion control blankets or sediment retention ponds, as required. Delineate and demarcate 2 m wide SPEA and protect from encroachment. Use appropriate equipment to conduct works. Avoid use of tracked machinery in sensitive areas. Conduct equipment check prior to working within riparian areas. Conduct periodic environmental monitoring and water quality testing, as required.	No impact
Soil Stripping	Reduction in water quality as a result of mobilization of sediment and erosion	As above	Not significant
Cut Excavation and Rock Excavation / Blasting	Reduction in water quality as a result of mobilization of sediment and erosion.	As above	Not significant
Road Pre-construction and Fill Placement	Reduction in water quality as a result of mobilization of sediment and erosion.	As above	Not significant
POTENTIAL PROJECT COMPONENT: Construction / Retrofit and Installation of Culverts and Wildlife Crossings	Reduction in water quality as a result of mobilization of sediment and erosion. Unscheduled release of uncured concrete. Altered hydrology; Increase in invasive plants.	Design and implement a Sediment and Erosion control plan to prevent sedimentation to downstream areas. May include the use of trenched silt fencing, check dams, erosion control blankets or sediment retention ponds, as required. Give preference for pre-cast headwalls and culverts, where possible. When uncured concrete is being used, ensure that adequate spill prevention measures are in place.	Potential loss of instream and riparian habitat to accommodate culverts / roads.

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
		Use drainage blankets and culverts to maintain existing hydrology. Re-plant disturbed riparian areas with native vegetation as soon as possible to prevent colonization of invasive plants.	
Utility, Fencing and Infrastructure Access Construction	Reduction in water quality as a result of mobilization of sediment and erosion.	As above	Not significant
Road Paving	Discharge of deleterious substances.	Isolate work area prior to works and implement necessary mitigation measures to prevent sedimentation and erosion issues to adjacent areas.	Not significant
Operational Phase			
Active Residential Community	Reduction in water quality due to road run-off. Increase of anthropogenic waste / garbage in riparian / creek side areas.	Remove litter from roadside areas on a regular basis as a component of road maintenance, as planned. Limit human access to sensitive riparian and creek side areas through fencing and signage.	Not significant
Safety / Environmental and Human Health			
Construction Equipment Spills	Potential impacts to survival. Concrete spills during concrete work.	Implement and adhere to an Emergency Spill Response Plan. Ensure that adequate spill containment materials are available on-site. Park equipment on spill pads. Fuel machinery in excess of 30 m from tributaries / drainage features. Store CO_2 canisters and diffusers on-site in case of concrete spill.	Not significant
Construction Debris	Impacts from debris	Remove debris from Site on a regular basis. Fence-off / isolate & cover debris / stockpiles	Not significant
Accidents & Malfunctions	Potential impacts to survival Deleterious discharges	Prepare and adhere to a Project-specific CEMP	Not significant

9.3 Surface Water Quality and Storm Run-off

Maintaining the existing drainage pattern and water quality during the construction and operational phases of the Project reduces impacts on numerous species and nearby sensitive habitats; therefore, surface water quality and storm water run-off were included as a VEC.

9.3.1 Potential Impacts

Potential impacts to surface water quality and storm water run-off as a result of the Project include:

- increased TSS / turbidity;
- mobilization of sediment into the water column during cut-and-fill and excavation operations;
- Introduction of uncured concrete leachate into tributaries within the alignment footprint; and
- Contamination due to accidents and malfunctions

A summary of the significance of potential impacts on surface water quality and stormwater run-off (prior to implementation of mitigation measures) is provided in **Table 9**.

Table 9. Relative Significance of the Potential Impacts on Surface Water Quality and Storm Water Run-off

Project Component	**Evaluation Criteria**						
	Context	**Magnitude**	**Extent**	**Duration**	**Timing**	**Frequency**	**Reversibility**
Construction Phase							
Clearing and Grubbing	medium	low	immediate area / local	long-term	immediate / delayed	intermittent	reversible
Soil Stripping	medium	medium	immediate area / local	short-term	immediate / delayed	intermittent	reversible
Cut Excavation and Rock Excavation / Blasting	low	low	immediate area / local	long-term	immediate / delayed	intermittent	reversible
Road Pre-construction	low	medium	immediate area / local	long-term	immediate / delayed	intermittent	reversible

Project Component	Evaluation Criteria						
	Context	**Magnitude**	**Extent**	**Duration**	**Timing**	**Frequency**	**Reversibility**
and Fill Placement							
Utility, Fencing and Infrastructure Access Construction	n/a	n/a	n/a	long-term	Immediate	Continuous	reversible
Road Paving	low	low	immediate area	long-term	delayed	continuous	irreversible
Operational Phase							
Active Residential Community	low	low	immediate area/ local	long-term	immediate/ delayed	continuous	irreversible
Safety / Environmental and Human Health							
Construction Equipment Spills	low	low	local	short-term	immediate/ delayed	intermittent	reversible
Construction Debris	low	low	immediate area	short-term	immediate/ delayed	intermittent	reversible
Accidents & Malfunctions	low	low	immediate area/ local	short-term	immediate/ delayed	intermittent	reversible

9.3.2 Mitigation Measures

The following mitigation measures will be implemented to alleviate potential environmental impacts to surface water quality and stormwater run-off, detention, and infiltration, where possible:

1. Complete a contractor Construction Environmental Management Plan (CEMP) to plan for unscheduled discharges and accidents with the potential to impact surface water quality;
2. Require construction contractor to comply with the Emergency Spill Response Plan (as a component of the CEMP) to adequately respond to equipment leakage and spills;
3. Implement and adhere to a Site-specific Sediment and Erosion Control Plan (as a component of the CEMP), which may include the use of silt fencing, geotextile fabric, check dams, hay bales, filter socks (e.g., Filtrexx), erosion blankets and/or detention ponds during excavation and cut-and-fill operations, as needed;

4. Conduct construction works in the dry, where possible;
5. Re-vegetate exposed areas after construction is complete with native riparian or seed mix;
6. Isolate work area when uncured concrete is in use;
7. Dispose of waste materials in accordance with applicable regulations at licensed facilities;
8. As a precaution, ensure that spill-containment kits containing sufficient quantities of absorbent materials are present on-site during the proposed remediation works in close proximity to working machinery;
9. Conduct regular environmental monitoring coupled to periodic water quality sampling (TSS/turbidity) and locations downstream from the active construction area following rainfall events more than 25 mm within 24 hrs., by a qualified environmental monitor; and
10. Install stormwater filtration system designed to effectively reduce TSS, hydrocarbons, metals and other contaminants potentially within storm water run-off.

9.3.3 Residual Effects

Through the implementation of the recommended mitigation measures, no significant adverse environmental impacts to surface and storm water run-off are expected to occur.

9.3.4 Surface Water Quality and Storm Run-off - Section Summary

Potential Impacts, associated mitigation measures to minimize the potential impacts to surface water quality and storm water run-off and anticipated residual effects, if any, are summarized in **Table 10**.

Table 10. Summary of Potential Impacts, Corresponding Mitigation Measures and Residual Effects Associated with Proposed Project Works on Surface Water Quality and Storm Water Run-off.

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
Construction Phase			
Clearing and Grubbing	Potential erosion and release of sediment into nearby waterbodies	Design and implement a Sediment and Erosion Control Plan and include in CEMP. Conduct works in the dry, where possible. Conduct periodic environmental monitoring, as required.	Not significant
Soil Stripping	Potential erosion and release of sediment into nearby waterbodies	As above	Not significant
Cut Excavation and Rock Excavation / Blasting			Not significant
Road Pre-construction and Fill Placement			Not significant
Construction / Retrofit and Installation of Culverts and Wildlife Crossing			Not significant
Utility, Fencing and Infrastructure Access Construction	None anticipated	None	Not Applicable
Road Paving	None anticipated	None	Not Applicable
Operational Phase			
Active Residential Community	Decrease in surface water and storm water quality discharging from the road ways.	Conduct regular inspections and maintenance to verify water quality.	Not significant

Table 10. Con't.

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
Safety / Environmental and Human Health			
Construction Equipment Spills	Potential impacts to survival Concrete spills during development	Implement and adhere to an Emergency Spill Response Plan Ensure that adequate spill containment materials are available on-site Complete CEMP to plan for unscheduled discharges and accidents with a potential to impact surface water quality Store CO_2 canisters and diffusers on-site in case of concrete spill	Not significant
Construction Debris	Impacts from debris	Remove debris from Site on a regular basis and as soon as possible Fence-off / isolate & cover debris / stockpiles	Not significant
Accidents & Malfunctions	Potential impacts to survival Deleterious discharges	Prepare and adhere to a Project-specific CEMP	Not significant

9.4 Air Quality

The construction works may temporarily affect air quality (via combustion emissions) near the Site. Fugitive dust from excavated materials and exposed, unvegetated soil surfaces may also pose localized air quality concerns. During the operational period, increased traffic volumes within the development area have the potential to affect air quality, particularly during prolonged hot weather with little or no wind to facilitate dissipation. As such, air quality has been included for consideration and investigation as a VEC.

9.4.1. Potential Impacts

9.4.1.1 Construction Phase

Potential impacts to air quality as a result of the Project during the construction phase are anticipated to include the following:

- Fugitive dust as a result of vehicular traffic entering and leaving the Site;
- Fugitive dust resulting from unpaved access/construction roads;

- Fugitive dust resulting from uncovered stockpiles;
- Fugitive dust resulting from cut-and-fill and excavation operations;
- Odors during paving and painting; and
- Construction vehicle and machinery emissions.

9.4.1.2 Operational Phase

Potential impacts to air quality as a result of the Project during the operational phase are anticipated to be limited to increased localized concentrations of particulate matter (PM) and common pollutants in the vicinity of the Site associated with increased traffic including, but not limited to, carbon monoxide, sulfur dioxide, and hydrocarbons

A summary of the significance of potential impacts on air quality (before implementation of mitigation measures) is provided in **Table 11.**

Table 11. Relative Significance of the Potential Impacts to Air Quality

Project Component	**Evaluation Criteria**						
	Context	**Magnitude**	**Extent**	**Duration**	**Timing**	**Frequency**	**Reversibility**
Construction Phase							
Clearing and Grubbing	low	low	immediate area	long-term	immediate	continuous	reversible
Soil Stripping	moderate	high	immediate area / local	long-term	immediate	continuous	irreversible
Cut Excavation and Rock Excavation / Blasting	moderate	high	immediate area / local	long-term	immediate	continuous	irreversible
Road Pre-construction and Fill Placement	low	medium	immediate area / local	long-term	immediate	continuous	irreversible
Utility, Fencing and Infrastructure Access Construction	n/a	low	immediate area	long-term	immediate	continuous	irreversible

Project Component	Evaluation Criteria						
	Context	**Magnitude**	**Extent**	**Duration**	**Timing**	**Frequency**	**Reversibility**
Road Paving	low	n/a	n/a	n/a	n/a	n/a	n/a
Operational Phase							
Active Residential Community	low	n/a	n/a	n/a	n/a	n/a	n/a
Safety / Environmental and Human Health							
Construction Equipment Spills	n/a	low	immediate area	short-term	immediate	intermittent	reversible
Construction Debris	n/a	high	n/a	n/a	n/a	n/a	n/a
Accidents & Malfunctions	n/a	high	immediate area/local	short-term/ long-term	immediate/ delayed	intermittent	reversible

9.4.2 Mitigation Measures

The following operational mitigation measures will be implemented to address potential environmental impacts to air quality:

- Develop and implement and Air Quality Management Plan as a component of the CEMP;
- Familiarize and adhere to section 8.7 of the Ministry of Water, Land and Air Protection Ecosystem Standards and Planning Biodiversity Branch document entitled: “Environmental Best Management Practices for Urban and Rural Development” (June 2004);
- Use environmentally acceptable dust suppressants (e.g., Dustguard®) or water, as necessary, to control dust on unpaved access roads. Control dust throughout the life of the construction phase of the Project. Do not use oils for dust control. Give preference to the use of water, bearing in mind water conservation and drainage / potential sedimentation issues where appropriate;
- Cover stockpile(s) with tarpaulins or polypropylene sheeting;

- Use low sulfur diesel;
- Conduct paving and line-painting works on calm days, where feasible;
- Minimize idling of heavy equipment and truck traffic; and
- Use electrical equipment over gasoline/diesel equipment, where feasible.

9.4.3 Residual Effects

With the mitigation measures proposed, there are unlikely to be significant adverse air quality effects from construction activities or operations.

9.4.4 Air Quality - Section Summary

Potential Impacts, associated mitigation measures to minimize the potential impacts to air quality and anticipated residual effects, if any, are summarized in **Table 12**.

Table 12. Summary of Potential Impacts, Corresponding Mitigation Measures and Residual Effects Associated with Proposed Project Works on Air Quality

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
Construction Phase			
Clearing and Grubbing	Fugitive Dust Vehicle and machinery emissions	Familiarize and adhere to the EC document entitled: "Best Practices for the Reduction of Air Emissions from Construction and Demolition Activities, March 2005" Develop and implement an Air Quality Management Plan as a component of the CEMP Cover stockpiles with tarps or polypropylene sheeting Use environmental acceptable dust suppressants, as required Use low sulphur diesel Minimize vehicle idling Use electrical or manual equipment, where feasible	Not significant

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
		Conduct periodic environmental monitoring, as required	
Soil Stripping	As above	As above	Not significant
Cut Excavation and Rock Excavation / Blasting	As above	As above	Not significant
Road Pre-construction and Fill Placement	As above	As above	Not significant
Utility, Fencing and Infrastructure Access Construction	As above	As above	Not significant
Road Paving	Odours during paving or road-line painting.	Conduct on calm days, where scheduling permits	Not significant
Operational Phase			
Active Residential Community	Increased fossil fuel fumes	Reduce vehicle idling Allow for public transit and walking/biking options	Not significant
Safety / Environmental and Human Health			
Construction Equipment Spills	Volatization of spilled material	Implement and adhere to an Emergency Spill Response Plan Ensure that adequate spill containment materials are available on-site Develop and implement an Air Quality Management Plan as a component of the CEMP	Not significant
Construction Debris	Fugitive dust	Remove debris from the Site on a regular basis and as soon as possible	Not significant
Accidents & Malfunctions	Fugitive dust Volatization of spilled material	Ensure that the construction contractor prepares and adheres to a Project-specific CEMP	Not significant

9.5 Noise

During the construction phase, there are expected to be occasional periods when noise levels will be elevated. Similarly, noise levels will be elevated as a result of traffic during the operational phase. As such, noise was included as a VEC.

9.5.1 Potential Impacts

Cut-and-fill activities in areas of development with existing bedrock will require rock splitting and blasting, in addition to removal via excavators and dump trucks. These types of sensory disturbances are expected to be short-term and are likely to have short-term, reversible impacts on birds and mammals utilizing the 19963 McNeil Road development area and surroundings. During the operational phase, noise as a result of traffic and residents utilizing the development will increase on a local level.

A summary of the significance of potential impacts as a result of Project-related noise (prior to implementation of mitigation measures) is provided in **Table 13**.

Table 13. Relative Significance of the Potential Impacts as a result of Project-related Noise

Project Component	**Evaluation Criteria**						
	Context	**Magnitude**	**Extent**	**Duration**	**Timing**	**Frequency**	**Reversibility**
Construction Phase							
Clearing and Grubbing	moderate	low	immediate area	long-term	immediate	intermittent	reversible
Soil Stripping	moderate	medium	immediate area / local	long-term	immediate	intermittent	reversible
Cut Excavation and Rock Excavation / Blasting	high	high	immediate area / local	long-term	immediate	intermittent	reversible
Road Pre-construction and Fill Placement	low	medium	immediate area / local	long-term	immediate	intermittent	reversible
Utility, Fencing and Infrastructure Access Construction	low	low	immediate area	long-term	immediate	intermittent	reversible

Project Component	Evaluation Criteria						
	Context	**Magnitude**	**Extent**	**Duration**	**Timing**	**Frequency**	**Reversibility**
Road Paving	low	n/a	immediate area	short-term	n/a	intermittent	reversible
Operational Phase							
Active Residential Community	moderate	n/a	n/a	long-term	n/a	continuous	n/a
Safety / Environmental and Human Health							
Construction Equipment Spills	n/a	low	immediate area	n/a	immediate	n/a	n/a
Construction Debris	n/a	high	n/a	n/a	n/a	n/a	n/a
Accidents & Malfunctions	n/a	high	immediate area/ local	short-term/ long-term	immediate	n/a	reversible

9.5.2 Mitigation Measures

The following operational mitigation measures will be implemented to address potential environmental impacts as a result of noise:

9.5.2.1 Construction Phase

Mitigation measures to be implemented during the construction phase include:

1. Coordinate and schedule activities to minimize overall construction-related noise levels, where possible;
2. Restrict construction activities to normal weekday day-time, where possible;
3. Enforce engine speed limits that are consistent with minimum noise generation at the work site;
4. Utilize the natural terrain to direct as little noise as possible towards noise sensitive areas;
5. Blasting should not be conducted, but if it is required in limited occasions, it should be conducted outside of the nesting season (and outside the extended season if the heron rookery is active), per Section 9.1.3. If blasting is deemed to be required, consider drill-

and-shoot method or smaller charges to reduce the amount of noise produced;

6. Consider blast-mats during blasting to reduce noise produced;
7. Schedule construction activities generating significant noise, such as blasting, in an intermittent fashion, where possible, and not for extended periods during any given day;
8. Minimize equipment and vehicle idling times and the use of compression release engine brakes on trucks, particularly in residential areas during the early hours;
9. Ensure that exhaust systems function in a manner to control exhaust noise within acceptable levels. If night-time work is required, fit all construction equipment with residential-rated mufflers/silencers;
10. Perform general construction operations to minimize noise through timing and duration of activities;
11. Conduct a visual assessment for wildlife prior to and during blasting activities (via binoculars) and temporarily cease works (under the direction of the environmental monitor), if required; and
12. Develop a Noise Management Plan as a component of the CEMP, including the establishment of a noise complaint program, to ensure that noise will not become an issue with this project.

9.5.2 Residual Effects

No residual noise issues are expected with the implementation of appropriate procedures during the proposed construction phase of the Project.

9.5.3 Noise - Section Summary

Potential Impacts, associated mitigation measures to minimize the potential impacts as a result of noise and anticipated residual effects, if any, are summarized in **Table 14**.

Table 14. Summary of Potential Noise Impacts, Corresponding Mitigation Measures and Residual Effects Associated with Proposed Project Works

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
Construction Phase			
Clearing and Grubbing	Disruption to wildlife species Disruption to local area residents	Coordinate and schedule activities to minimize overall construction-related noise levels Restrict construction activities to the allotted time periods Utilize the terrain to direct noise away from sensitive areas Notify public of blasting activities Comply with CCOHS and WorksafeBC Conduct noisier activities in an intermittent fashion Utilize noise attenuating devices (i.e., mufflers) on equipment and ensure they are in good working order	Not significant
Soil Stripping	As above	As above	Not significant
Cut Excavation and Rock Excavation / Blasting	Disruption to wildlife species Disruption to local area residents	Assess for wildlife species (via a qualified environmental monitor) in the vicinity of the work area prior to blasting Consider drill-and-shoot method or smaller charges to reduce noise produced Consider blast-mats to reduce noise produced during blasting activities	Not significant
Road Pre-construction and Fill Placement	As above	Coordinate and schedule activities to minimize overall construction-related noise levels Restrict construction activities to the allotted time periods Utilize the terrain to direct noise away from sensitive areas Notify the public of blasting activities Comply with CCOHS and WorksafeBC Conduct noisier activities in an intermittent fashion	Not significant

Project Component	Potential Impact(s)	Mitigation Measure(s)	Residual Effects
		Utilize noise attenuating devices (i.e., mufflers) on equipment and ensure they are in good working order	
Utility, Fencing and Infrastructure Access Construction	As above	As above	Not significant
Road Paving	As above	As above	Not significant
Safety / Environmental and Human Health			
Construction Equipment Spills	n/a	n/a	n/a
Construction Debris	n/a	n/a	n/a
Accidents & Malfunctions	n/a	n/a	n/a

10 ENVIRONMENTAL IMPACT ASSESSMENT RESIDUAL EFFECT ANALYSIS SUMMARY

The impacts associated with the proposed development can generally be mitigated via the implementation of mitigation strategies provided herein for the identified VECs. No significant residual impacts were identified as part of this evaluation of impacts associated with the proposed development. Moreover, retention of the drainage ditch / swale bordering the eastern site boundary within the eastern portion of the site, and a proposed 30 m offset from the ALR Boundary per OCP Schedule 1 will provide the most noteworthy habitat preservation measures, serving as effective mitigation. In addition to lower density / yield for each parcel, which provides opportunities for retention of vegetation and natural features, this 30 m naturalized vegetated area provides a wildlife movement corridor through the site as well as protects the identified and mapped red-listed ecosystem observed on-site and identified per the provincial CDC mapping site. Lower density and larger lot size is also anticipated to facilitate wildlife movement through the site in an east-west direction provided the recommendations provided herein, which have been incorporated into the design. As such, the AquaTerra Qualified Environmental Professional (QEP) support this proposed development provided the mitigation measures and design details are followed, as provided.

11 CLOSURE

This Environmental Impact Assessment report was prepared for the client / landowner and the City of Pitt Meadows to facilitate environmentally responsible site development aligning with the City of Pitt Meadows development principles as listed in their 2022 Official Community Plan.

We trust that the information herein provides the client and city with the necessary information to review and establish development principles to facilitate development.

Respectfully submitted,

Jordan Field B. Sc., ABTech, BC-CESCL
Biologist
AquaTerra Environmental Ltd.

JUAN JAIMES

Juan Jaimes., Juan Diego Jaimes, Dip Tech
Environmental Technician
AquaTerra Environmental Ltd.

AQUATERRA ENVIRONMENTAL LTD.

Digitally signed by Chris Lee
DN: cn=Chris Lee, o, ou=AquaTerra Environmental Ltd., email=chris@aquaterra.ca, c=CA
Date: 2025.01.28 11:36:35 -08'00'

Chris Lee, M.Sc., RPBio, QEP, AQP, BC-CESCL
Principal / Project Manager
AquaTerra Environmental Ltd.

12 REFERENCES

B.C. Conservation Data Centre. 2022. BC Species and Ecosystems Explorer. B.C. Government, Victoria B.C. Available on-line here: http://a100.gov.bc.ca/pub/eswp/

Chilibeck, B., Chislett, G. and G. Norris. 1992. *Land Development Guidelines for* the Protection of Aquatic Habitat. ISBN 0-7726-1582-9

Cullington. 2014. Develop with Care 2014: Environmental Guidelines for Urban and Rural Land Development in British Columbia.
Available on-line here:
http://www.env.gov.bc.ca/wld/documents/bmp/devwithcare2014/DWC-Cover.pdf

Ferguson, G. 2014. *Beneficial Management Practices for Barn Swallow (Hirundo rustica).* BC Swallow Conservation Project.

Ministry of Environment, Lands and Parks (MELP). July 1998. Planting Criteria and Recommended Native Tree and Shrub Species for Restoration and Enhancement of Fish and Wildlife Habitat. Ministry of Environment, Lands and Parks.

MELP 1999. British Columbia Wildlife Habitat Rating Standards. Prepared by the Ministry of Environment, Lands and Parks Resources Inventory Branch for the Terrestrial Ecosystem Task Force Resources Inventory Committee. Version 2.0. Available on-line here: http://www.llbc.leg.bc.ca/public/pubdocs/bcdocs/335486/whrs.pdf

Ministry of Forests, Lands and Natural Resource Operations (MFLNRO). 2013. Guidelines for Raptor Conservation during Urban and Rural Land Development in British Columbia. Available on-line here:
www.env.gov.bc.ca/wld/.../raptor_conservation_guidelines_2013.pdf

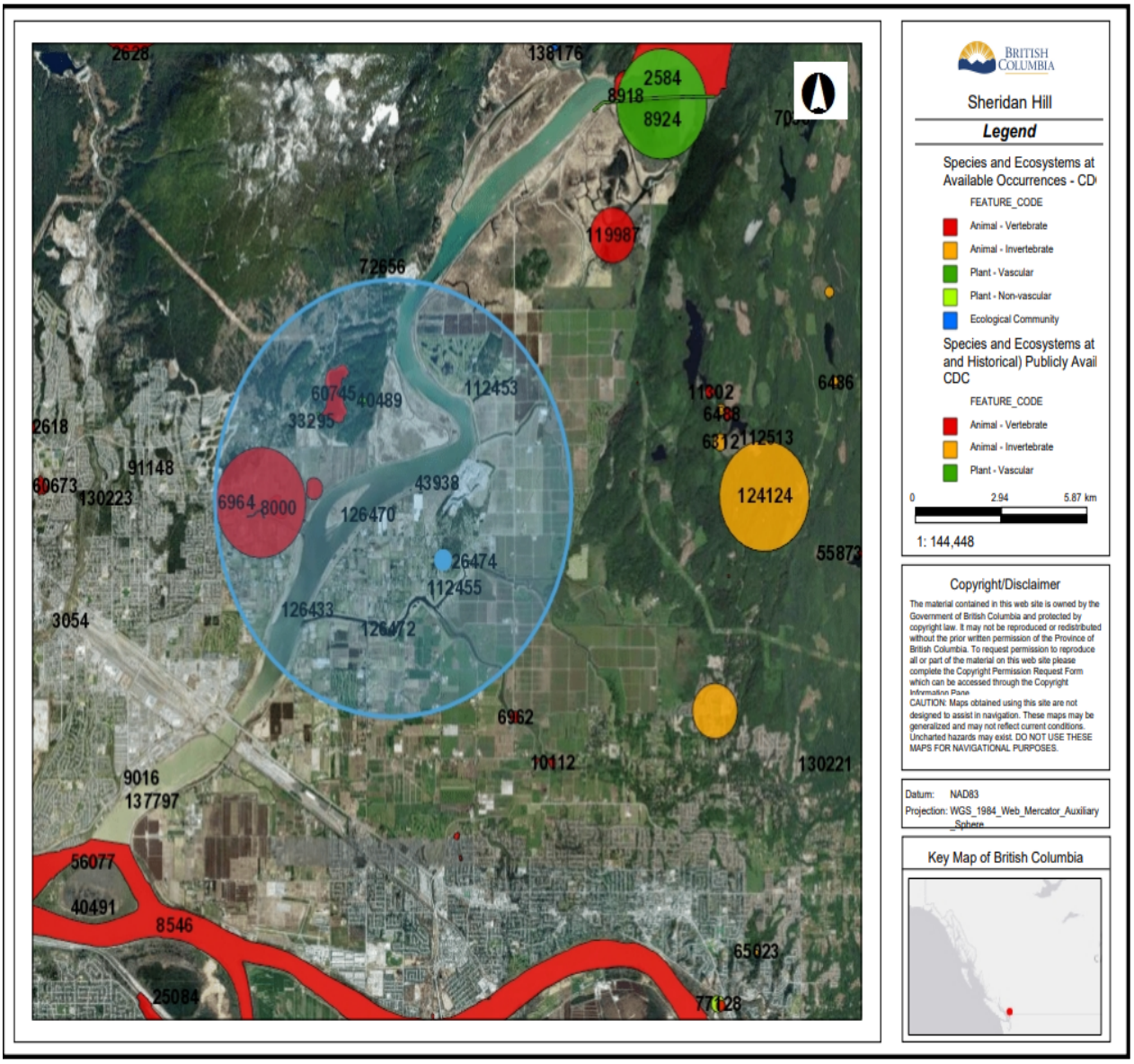
Phoenix Environmental Services LTD. 2014.Environmental Assessment Report: Proposed Residential Development 19963 McNeil Road, Pitt Meadows, B.C. Unpublished report prepared for Davenport Design Group Ltd. and Canadian Rockies International Investment GR.

APPENDIX A

Proposed Project Design Details

APPENDIX B

Conservation Data Center Mapping Results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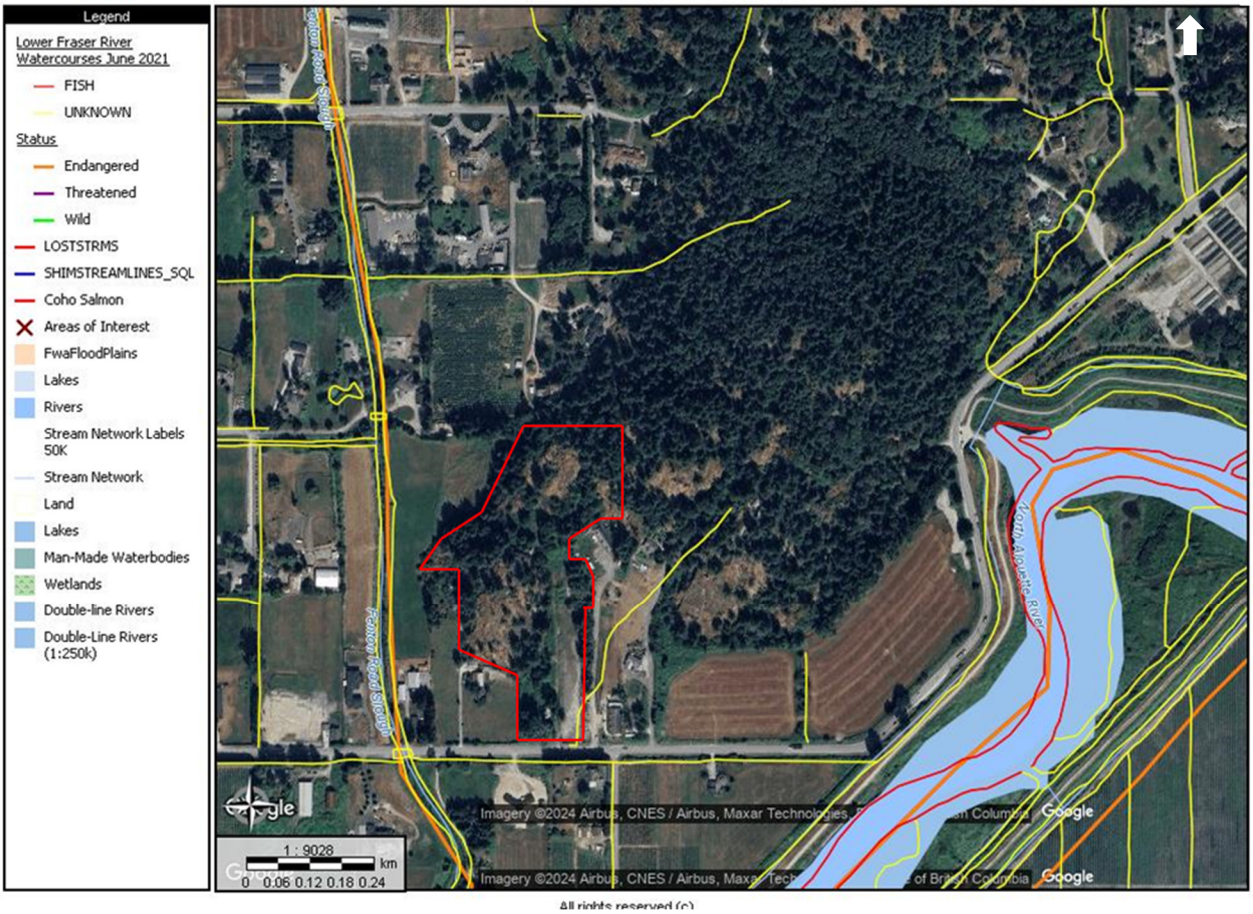
Datum: NAD83
Projection: WGS_1984_Web_Mercator_Auxiliary_Sphere
Key Map of British Columbia

APPENDIX C

SHIM Mapping Results



APPENDIX D

2024 Field Survey Photographs

Photo 1. Entrance of the adjacent houses east of the site .

Photo 2. Generally dry man-made ditch along the eastern border near McNeil Road.

Photo 3. Reed canary grass observed in the ditch looking north.

Photo 4. Bear scar observed within the site boundaries.

Photo 5. Derelict building at the northwest side of the site**.**

Photo 6. Western Redcedar / Sword Fern Dry Maritime Ecosystem Characteristics.

Photo 7. Rock Outcrop at the north section of the site.

Photo 8. Southwest view of the property from the north section of the property.

APPENDIX E

Terrestrial Vegetation Species Details

Plant Species observed in the 2024 Field Assessment

	Common Name	Scientific Name
Tree species	Bigleaf maple	*Acer macrophyllum*
	Black cottonwood	*Populus trichocarpa*
	Crabapple sp.	*Malus* sp.
	Douglas fir	*Pseudotsuga menziesii*
	Oregon white oak	*Quercus garryana*
	Paper birch	*Betula papyrifera*
	Vine maple	*Acer circinatum*
	Western redcedar	*Thuja plicata*
	White poplar	*Populus alba*
Shrub Species	Baked hazelnut	*Corylus cornuta*
	Hardhack	*Spiraea douglasii*
	Red huckleberry	*Vaccinium parvifolium*
	Salal	*Gaultheria shallon*
	Saskatoon serviceberry	*Amelanchier alnifolia*
Herbaceous Species	Pacific bleeding heart	*Dicentra formosa*
	Stinging nettle	*Urtica dioica*
Fern Species	Licorice fern	*Polypodium glycyrrhiza*
	Sword fern	*Polystichum munitum*
Invasive Species	Common foxglove	*Digitalis purpurea*
	Cutleaf blackberry	*Rubus laciniatus*
	English holly	*Ilex aquifolium*
	Field bindweed	*Convolvulus arvensis*
	Himalayan balsam	*Impatiens glandulifera*
	Himalayan blackberry	*Rubus armeniacus*
	Reed canary grass	*Phalaris arundinacea*