

**FISHERIES AND OCEANS**  
**CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)**  
**SCREENING REPORT**

**GENERAL INFORMATION**

**1. EA Title:** Commercial/Residential Development – Wren Street and Highway 7 – Wren Creek and Unnamed Tributary

**2. Proponent:**

Carhoun & Sons Enterprises Ltd.  
1654 W. 75<sup>th</sup> Avenue  
Vancouver, BC V6P 6G2  
(604) 657-5535

**3. Other Contacts (Other Proponent, Consultant or Contractor):**

Scott Resource Services Inc. (SRS)  
31856 Silverdale Avenue  
Mission, BC V2V 2K9  
(604) 820-1415

**4. Role:**

Environmental Consultant for the Proponent

**5. Source:** Scott Resource Services Inc.

**6. EA Posting Date:** September 21, 2010

**7. CEAR (or FEAI) No.:** 10-0158069

**8. PATH No.:** 09-HPAC-PA2-00271

**9. DFO File No.:**

**10. Provincial/Territorial File No.:**

File No. A20058532 relating to Section 9 of the *Water Act* for *Works In and About a Stream* (BC Ministry of Forests, Lands and Natural Resource Operations)

**BACKGROUND**

**11. Background about Proposed Development (including a description of the proposed development):**

Carhoun & Sons Enterprises Ltd. (the Proponent) is proposing to infill three ravines including wetland and adjacent riparian areas in order to expand the developable area on 6 lots from approximately 6.5 hectares to approximately 13 hectares (the Project). Fisheries and Oceans Canada (DFO) initiated the subject environmental assessment on September 21, 2010. Details of the proposed project are available within the following documents: application titled "Environmental Impact Assessment for the proposed commercial and residential development at Wren Street and Highway 7, Mission, B.C." prepared by Scott Resource Services Inc. and provided to DFO on September 9, 2009 (Appendix A); and, the compensation plan titled "Proposed conceptual compensation plan for the Wren Creek development, Mission, B.C." prepared by Scott Resource Services Inc., dated January 26, 2011 (Appendix B).

The addresses of the 6 lots are: 31802 Hillcrest Avenue; 31831, 31941 and 31971 Lougheed Highway; 31896 Raven Avenue; and, 7233 Wren Street in Mission, B.C.

The proposed development involves commercial and residential development; the 6 properties are currently designated Service Commercial and Residential Zoning in the District of Mission's Official Community Plan.

The current proposal entails infilling three ravines, wetlands and associated riparian areas. Two non-fish bearing streams flow through two of the ravines and cross Highway 7 to the south and flow west through a channelized wetland (the tributary stream) located between the Canadian Pacific Railway and the Highway 7 for a distance of approximately 860 metres before entering Silverdale Creek.

Prior to initiating the subject environmental assessment DFO received an application for review and request for s.35(2) *Fisheries Act* Authorization in relation to the subject project on September 9, 2009 (Appendix A). DFO reviewed and responded to the proposal in October 26, 2009 and March 18, 2010 (Appendix X) and in both instances recommended that the project be relocated or redesigned to avoid impacts to fish and fish habitat. At the request of the proponent an additional review was completed. The review reconfirmed the initial DFO assessment of the value of the fish habitat and

risk (high) associated with the project was correct but did recommend to continue the *Fisheries Act* review and initiate a review under the Canadian Environmental Assessment Act. (DFO Email - August 18, 2010 – Appendix Y)

In 2002 DFO received a re-zoning application for review for the properties from the District of Mission (the District) At the time DFO did not advise against the proposed change in land use designation. However, in the February 4, 2002 letter from DFO to the District (Appendix C), DFO did specifically recommend that all environmentally sensitive areas including the entire ravines and riparian areas including 15 metre setbacks along the ravine top of banks be protected in perpetuity and, “There be no disturbance within the ravines, including a setback area measuring 15 metres inland horizontally from the top of bank of the ravines on both sides of the ravines”. This recommendation was consistent with the “Land Development Guidelines for the Protection of Aquatic Habitat” which was the standard manual used for applying Best Management Practice’s for directing urban development around aquatic environments in British Columbia from approximately 1992 to 2004.

In 2003 the Proponent proposed to drill test holes in the ravines to assess the feasibility of developing land within the ravines and adjacent areas. DFO responded in writing on August 12, 2003 (Appendix D) stating that “As DFO does not support development activity within the Creek ravines there does not appear to be any justification or rationale for carrying out the proposed works and the resulting impacts to fish habitat. Accordingly, DFO will not support or otherwise authorize the proposed works.”

A development application process with the District of Mission (the District) for the current proposal has not been initiated. Because the proposal would vary from the District’s riparian protection bylaw the District has allowed Proponent to discuss their proposal with DFO and seek necessary permits from DFO prior to initiating a development application process with the District.

Need for and purpose of the project

The need for the project is to supply residential and local commercial retail space to meet potential market demands.

From a proponents perspective the purpose of the project is to develop the site in order to achieve a potential economic return.

From a local government perspective the purpose for of the project, and rationale for supporting its consideration, relates to its potential to provide local employment, local tax revenues, development cost charge revenue, and a number of objectives identified under the local government Official Community Plan.

**ENVIRONMENTAL ASSESSMENT**

<p><b>12. DFO Trigger(s):</b> <i>Law List Regulations</i> - The authorization of the harmful alteration, disruption or destruction (HADD) of fish habitat.</p>	<p><b>13. Act &amp; Section(s):</b> Subsection 35(2) of the <i>Fisheries Act</i></p>
<p><b>14. Other RAs and RB(s):</b> none</p>	<p><b>15. CEEA Trigger(s) of Other RA(s) and RB(s):</b></p>
<p><b>16. Lead RA:</b> Fisheries &amp; Oceans Canada</p>	
<p><b>17. Other Jurisdiction:</b> none</p>	
<p><b>18. FEAC:</b> Fisheries &amp; Oceans Canada</p>	<p><b>19. Rationale for FEAC:</b> Lead RA</p>

**20. Expert Federal Authority (ies):**

Environment Canada  
Canadian Wildlife Service  
Pacific and Yukon Region  
5421 Robertson Road  
Delta, B.C. V4K 3N2  
(604) 940-4694

**21. Area(s) of Interest of Expert FA(s):**

Terrestrial wildlife and habitat, and terrestrial species at risk, migratory birds, water quality, and deleterious substances

**22. Other Contacts and Responses:**Transport Canada

DFO referred the project to Transport Canada on November 5, 2010; Transport Canada responded on December 2, 2010 indicating that they did not have a legislated responsibility or interest in the Project. (Appendix E).

Environment Canada

DFO referred the Project to Environment Canada including the initial Project submission on November 5, 2010 and the Project compensation plan document on February 10, 2011 for their comments and advice regarding environmental effects and mitigation.

DFO received a response from Environment Canada on August 15, 2011 indicating the project would result in likely adverse environmental effects of uncertain significance for Oregon forestsnail (OFS) and suggested DFO not provide any approvals that would allow the project to proceed (Appendix F).

DFO received additional comments from Environment Canada on October 20, 2011 (Appendix G) in response to information and questions provided by the Proponent on August 9, 2011 (Appendix H); Environment Canada confirmed earlier concerns and advice regarding the Project, provided in their August 15, 2011 correspondence.

Additional advice was received from Environment Canada on December 22, 2011 (Appendix I)

BC Ministry of Environment/BC Ministry of Forests, Lands and Natural Resources Operations (FLNR)

DFO referred the project including the initial submission on November 5, 2010 and the compensation plan documentation on February 10, 2011 to the B.C. Ministry of Forests, Lands and Natural Resource Operations for their comments and advice regarding potential environmental effects and mitigation.

DFO received a copy of a preliminary response to the project on April 26, 2011 (Appendix J) resulting from a proponent application under the *Water Act* on April 14, 2011. More substantive and detailed comments were provided by the FLNR on June 17, 2011 (Appendix K).

FLNR provided additional comments on September 19, 2011 (Appendix L).

A meeting with the Proponent and the Province was held on November 23, 2011. A summary of the meeting prepared by the Province was provided to DFO in an email dated November 23, 2011 (Appendix M) suggesting the Proponent will not amend the Project plan and feels that the all environmental effects resulting from the Project will be mitigated by the compensation plan.

An additional letter dated December 2, 2011 was provided to DFO discussing the Water Act Approval process and provided an update regarding OFS occurrences (Appendix N).

BC Ministry of Transportation and Infrastructure.

DFO referred the Project to the Ministry of Transportation and Infrastructure on November 5, 2010 and the compensation plan documentation on February 10, 2011. A response was provided to DFO outlining potential concerns regarding the project dated December 10, 2010. (Appendix O).

First Nations.

Letters were sent to 5 First Nations regarding the Project and requesting comments. (list of First Nations contacts Appendix P). No specific comments with regard to First Nation traditional use or importance of the site were received from First Nations.

Local Government (District of Mission).

DFO met with the District of Mission and received information regarding the long term forecast for growth in Mission that included an assessment of the potential economic benefits of the project for the community and consistencies

with Official Community Plan objectives (Appendix Q).

Additionally, the DFO Pacific Region Regional Director General received a letter from the District of Mission Mayor dated April 13, 2010, and April 23, 2011 stating the potential significance of the development to the District of Mission (Appendix R).

#### Public Input.

DFO received a letter from MLA Marc Dalton dated April 7, 2010 supporting the proposal due to potential habitat and economic benefits (Appendix S).

DFO received a letter from the Mission Chamber of Commerce dated July 20, 2011 advising of the importance of the project for the community; environmental and cost saving (Appendix T).

A number of comments were received from the public generally through the CEAA registry. DFO has prepared a summary of concerns / comments based of the comment received from the public (Appendix U).

The comments received from the forgoing agencies and individuals have been taken into consideration in evaluating this project pursuant to the Canadian Environmental Assessment Act.

#### Additional Correspondence

Additional correspondence from the proponent in response to public comments and meeting minutes with DFO , the District of Mission, and the proponent are located in Appendix Z and Appendix AA.

### **23. Scope of project (details of the project subject to screening):**

Fisheries & Oceans Canada has determined the scope of the project for the environmental assessment conducted pursuant to the *Canadian Environmental Assessment Act* to be the infilling and grading of approximately 6.4 hectares of relatively undeveloped land; three ravines including wetland habitat and associated riparian areas. The infilling works is part of the overall larger project which entails developing an approximately 13.55 hectare site into a commercial and residential development. In addition, and as part of the development, the proposal has included constructing a pond on the western edge of the property for stormwater treatment and retaining walls along the southern edge of the property.

More specific components of the Project include; clearing of vegetation in and around three ravines; removal (salvage) of wildlife species; enclosing two streams in pipes that currently flow within the ravines; importing and placement of fill material within the three ravines; discharging flows from the two ravines into downstream fish bearing waters; construction of a stormwater detention pond within or adjacent to the Silverdale Creek Wetland area; construction of commercial and residential buildings on top of the infilled ravines; and, construction of retaining walls.

A finalized design for the development including stormwater planning remains outstanding as the design will have to be reviewed and approved through the Local Government process, which has not been started.

Additionally, the works may entail diverting a portion of the existing urban stormwater flows that currently drain into the upstream ends of the ravines, away from the ravines and to the west where flows would eventually discharge to the Silverdale Creek Wetlands.

Hereafter, the term "project" refers to the project as scoped in the preceding paragraphs.

### **24. Location of project:**

The site is generally located on the south facing slope above Highway 7, between Wren Street, and the Silverdale Creek wetlands in Mission, British Columbia.

Latitude 49°08'01.87" N / Longitude 122°20'37.99" W

### **25. Environment Description:**

#### **General**

The site is located in the headwaters of a tributary stream to the Silverdale Creek. As described in the "Environmental Impact Assessment (Appendix A) two north-south orientated ravines bisect the property. Two watercourses (Watercourse 1 and Wren Creek) flow through the ravines. Watercourse flows are a result of stormwater and also from groundwater seeps that daylight in various locations within the ravines. The upper reaches of the watercourses

are largely contained within narrow stream channels, and the lower reaches where the gradient decreases considerably are braided (unconfined) and flow through large wide areas of wetland habitat (8,125 M<sup>2</sup> and 1,800 M<sup>2</sup> respectively).

A third ravine as noted in the Bianchini Biological Services report, "Wildlife and Vegetation Assessment of the Proposed Development at Wren Street and Lougheed Highway, Mission, BC" dated June 29, 2009 which is appended to the "Environmental Impact Assessment for the proposed commercial and residential development at Wren Street and Highway 7, Mission, B.C." report. (Appendix A) situated along the western edge of the Project, is orientated east-west and protrudes into the Silverdale Creek wetlands. The Bianchini and Scott Resources reports identified areas at the base of the three ravines as "floodplain". These areas are described in this screening report as "wetlands."

The ravines, wetlands and associated riparian areas can be characterized as largely undisturbed environments with the exception of a few urban encroachments including mountain biking trails, dumping of household refuse and gardening debris and instability or erosion in the upper reaches of the ravines caused by un-detained stormwater flows.

Watercourse 1 consists of five reaches and is approximately 424 metres long. Upper Wren Creek is approximately 284 metres in length. Both watercourses cross Highway 7 through culverts and enter a wetland and channel (the tributary stream); Highway 7 generally forms the southern boundary of the site. These watercourses are described as having ephemeral flows and may be dry at times during the later part of the summer.

The tributary stream situated along the south side of Highway 7 flows east to west for a length of approximately 860 metres before confluencing with Silverdale Creek mainstem. The upper reach of this tributary is a braided channel originating from a wetland, ranging from approximately 50 to 100 metres wide, and then flows through a treed wetland area located between the CPR Rail Line and Highway 7. The lower reach of the tributary stream forms a relatively small confined channel with pools and large woody debris that flows through a marshy area with a dense reed canary grass community. The lower reach has recently been enhanced to increase productivity for fisheries resources as a follow up to the Highway 7 upgrading / widening project where the stream was partially infilled during the course of those works and is considered important rearing habitat for juvenile salmon.

The wetland situated immediately west of the Project site and contiguous with the wetland located at the western edge of the project site is the Silverdale Creek Wetland area which was purchased by Ducks Unlimited and the District of Mission in 2005. The following Ducks Unlimited Canada web publication discusses the relative importance of the wetland,

## “BACKGROUND

### The Silverdale Creek Wetland in Mission, BC

The Silverdale Creek Wetlands, a 46-hectare (112-acre) land parcel in the Fraser Valley community of Mission, is an oasis of rare wetland habitat in the Lower Mainland's unique Fraser Delta ecosystem. The Fraser Delta and Fraser Valley has lost 85 per cent of its historical wetlands with the remaining 15 per cent under increasing threat, which is why the Silverdale Creek Project is a significant success for conservation in the Lower Mainland.

#### HABITAT

The Fraser Valley is a vital area of the province for migrating and wintering waterfowl along the BC Coast, comprising agricultural land and a mosaic of river floodplain and wetlands. Along the Fraser River floodplain, there are only a few remaining contiguous agricultural areas with wetlands that provide foraging and roosting habitat for migrating and wintering waterfowl.

#### WILDLIFE

The Silverdale Creek wetland currently provides wintering and migrating habitat for hundreds of dabbling waterfowl including mallard, wood duck, wigeon, and teal. Scaup, bufflehead and other diving ducks use the deeper areas of the marsh with estimates of 100-200 birds every day. These numbers are expected to increase with further conservation management.

In addition to waterfowl, herons, raptors, deer and songbirds can be observed at the Silverdale wetland. All five species of salmon use the wetland during rearing and over wintering periods.

The Stave Lake Salmonid Enhancement Society operates a hatchery for coho and chum salmon, which spawn in Silverdale Creek. The area also hosts other wildlife such as cougar and deer. The Silverdale Creek wetland which is surrounded by agricultural land and forest, boasts vegetation such as reed canary grass, fern and sedge species, Labrador tea and bulrush.

## THREATS TO HABITAT

The loss of wetlands is due to the pressures from rapid population growth, urban sprawl, and intensification and industrialization of agriculture. The Silverdale Creek Wetland conservation is key to Ducks Unlimited Canada's (DUC) long-range plans for the Fraser Valley that will aim to secure what little survives of natural habitat in the valley.

## CONSERVATION PLANS

The Silverdale Creek project is an example of the economic benefits of responsible land use and development. It is also a key component for the District of Mission's land use conservation strategy. The site is deemed by the District as the most environmentally—sensitive area within the municipality. The Silverdale Creek wetlands site is part of an overall municipal strategy to acquire approximately 1,100 acres of land within the Silverdale Creek linear corridor. With the subject acquisition, over 60 percent of this parkland corridor area will be in public ownership. The BC Ministry of Environment identified the Silverdale Creek wetland as the number one acquisition priority in the Lower Mainland, based on its biodiversity values.

To maintain and improve the Silverdale habitat, DUC, the District of Mission, and Stave Valley Salmonid Enhancement Society (SVSES) plan to work together to pursue a management plan consisting of environmental, educational and community goals to maximize the potential for the Silverdale Creek wetland.

## PARTNERS

The Silverdale project got off the ground through a partnership of DUC, the District of Mission, and SVSES.

The Silverdale Wetlands project was also developed and completed under BC Trust for Public Lands (BCTFPL) and several other participating agencies including the Canadian Wildlife Service of Environment Canada, the BC Ministry of Environment, BC Ministry of Agriculture, Fisheries and Foods, Union of BC Municipalities, Habitat Conservation Trust Fund, Nature Conservancy of Canada, The Nature Trust of British Columbia, The Land Conservancy of British Columbia and the Pacific Salmon Foundation.”

### **Fish habitat values**

#### Wren Creek and Watercourse 1 at the Project site:

During previous fish sampling efforts, fish were not observed in the watercourses at the Project site above (upstream) of Highway 7. While fish access to these two ravines and their respective watercourses is not deemed impossible and may be more likely now due to recent enhancements around and to the existing Highway 7 culverts, it is likely that during most times of the year access for fish to these watercourses would be considered difficult and unlikely. Although it is unlikely that the two watercourses provide any direct use for fish other than three spine stickleback they provide significant food and nutrient contributions to downstream areas where fish including coho salmon juveniles reside. In addition to the important contribution of food and nutrients to downstream areas, the wide wetland areas associated with the lower reaches of the two watercourses are expected to provide important hydrological buffering functions to stormwater and groundwater flows entering the site before discharging to the tributary stream south of Highway 7 (maintenance of low flows during summer dry periods). In addition, it is expected that these areas would provide water quality treatment by removing pollutants that may enter the ravines from the existing stormwater systems.

#### The tributary stream (south side of Highway 7 / downstream of the Project site):

Fish (coho salmon juveniles) have been observed in the Silverdale Creek tributary that flows along the south side of Highway 7 and south of the project site. Historically fish have been observed beyond a crossing located approximately 200 metres upstream of Silverdale Creek. Recent enhancement / restoration works included improving fish passage beyond this point; it is therefore expected that the range of fish use for juvenile coho salmon will include the treed wetland area above the old crossing point although the upstream range of fish use is uncertain at this time.

Generally, it is suggested that this tributary provides important habitat for over wintering coho juveniles. Juvenile coho salmon generally seek refuge in off channel areas such as this tributary during winter high flows typical of main stem channels.

In addition, the lower reach of the tributary stream is subject to back watering and flooding during the Fraser River spring freshet, and while the area has not been specifically assessed or sampled in order to confirm the use of this area for other juvenile salmon during freshet it is expected that this area may be utilized by other Fraser River fish stocks including sockeye and chinook during the period of their downstream migration and rearing. The area was recently enhanced (fall 2011) to increase the rearing capacity for juvenile salmon; a new channel and ponds were constructed and the area was planted with several hundred plants to provide cover and a source of food and nutrients for fish.

It must also be noted that a substantial portion of the flow for this area likely originates at the Project site including the stormwater and groundwater. Maintaining existing flows and water quality originating from the Project site is important in maintaining the fish habitat value of the tributary stream.

#### Silverdale Creek:

Silverdale Creek is one of 12 designated sensitive streams in British Columbia under the Sensitive Stream Designation and Licensing Regulation (Fish Protection Act, S.B.C 1997 c. 21). "Any application for license, approval, or an amendment to a license or approval with respect to this designated stream, which would include an application for a simple water crossing, triggers this regulation".

Silverdale Creek provides habitat for a number of salmonids including coho salmon (*Onchorhynchus kisutch*), pink salmon (*O. gorbuscha*), chum salmon (*O. keta*), cutthroat trout (*O. clarki clarki*), rainbow trout (*O. mykiss*), steelhead (*O. mykiss*) and other fish species.

Volunteers have been operating a fish collection fence on Silverdale Creek for capturing adult salmon in the fall and a small hatchery that produces juvenile coho salmon that are released into the Creek. Further, the District of Mission has recognized the importance and value of Silverdale Creek and has established a greenway strategy for the Silverdale Creek corridor and has been purchasing key properties along the Silverdale Creek mainstem.

Silverdale Creek joins the Silverdale Wetlands just upstream of the confluence of the tributary stream. The wetland has been extensively enhanced for fish and wildlife since 2008, through community partnerships and funding provided through habitat compensation agreements in association with Highway 7 upgrades. The majority of the remaining wetland was purchased with support by Ducks Unlimited in cooperation with a number of other partners and now forms part of the District of Missions park system. This wetland extends into the western edge of the Project site.

In summary, the existing aquatic habitat at the Project site provides an important source of food and nutrients and stable clean water flows to the Silverdale Creek tributary and Silverdale Creek main stem downstream of the Project site where fish such as coho salmon juveniles as well as potentially other fish species reside during various life cycle stages. Additionally, the wetland areas at the Project site provide important natural flow and water quality buffering of otherwise untreated stormwater that flows through the site and into downstream fish-bearing areas where salmon rear.

#### **Wetland habitat**

There are approximately 2.1 ha. of floodplain / wetland habitat (described as floodplain habitat in the Bianchini Biological Services report, June, 2009 report) situated downslope of the three ravines where the gradient flattens and the ravines open up as documented in the Bianchini Biological Services report, June, 2009 (included in Appendix A). While not quantified, wetland habitat is expected to extend beyond the flat portions into adjacent sloped areas where groundwater seeps and wetland associated species such as skunk cabbage exist. Flows from the wetlands associated with the two easterly ravines cross Highway 7 to the south and enter a 860 metres long wetland and channel complex situated between Highway 7 and the CPR rail line (the tributary stream).

Additionally, the Silverdale Creek wetlands are situated adjacent to and are contiguous with the west side of the development site. The westerly ravine (east-west orientation) slopes down toward and connects to the Silverdale Creek wetlands. While identified as "floodplain" in the Bianchini report the description identifies wetland plant species and flows that indicate this ravine and wetland are contiguous with the Silverdale Wetlands. The Silverdale Creek wetlands is a 46 ha. land parcel in the Fraser Valley, that is considered an "oasis of rare wetland habitat in the Lower Mainland's unique Fraser Delta ecosystem" (Backgrounder by Ducks Unlimited attached to the Environment Canada December 22, 2011 letter (Appendix I). Utilized as wintering and migrating habitat for hundreds of dabbling waterfowl with estimates of 100-200 birds every day. In addition, herons, raptors, deer, and songbirds are also present. All five salmonid species utilize the wetland during rearing and over-wintering periods. The site is deemed by the District of Mission as the most environmentally-sensitive area within the municipality.

The Silverdale Creek wetland has been enhanced in recent years and several thousand square metres of channel and pond habitat have been created to enhance the productivity of the wetlands for salmon, as well as terrestrial wildlife species.

#### **Terrestrial Habitat Values**

The following description is generally taken from the Bianchini Biological Services report previously referenced in Appendix A.

The forested portion of the site is generally bisected by two north-south running ravines. An east-west orientated ravine also occurs at the western section of the site and is part of the Silverdale Creek wetland. The upland portions of the site are dominated by deciduous forest, while the ravines are dominated by mixed deciduous-coniferous forest. East of the eastern ravine the site was previously cleared and is now dominated by invasive and pioneer plant species.

The vegetation found on this site can be classified into four general categories: Upland Vegetation type, Ravine Vegetation Type, Floodplain Vegetation Type, and Disturbed Vegetation Type. The upland vegetation type covers approximately 1.6 ha. of the site and consisted of mostly bigleaf maple, red alder, salmonberry, Indian plum, red elderberry, Bleeding heart, Stinging nettle, Youth on age, and Sword fern. The ravine vegetation type occurs in three places on the site and on steep sided slopes (60-70%). The major species found here include western red cedar, bigleaf maple, western hemlock, salmonberry, and sword fern. The Floodplain Vegetation type occurs at the base of the three ravines located within the project site. These sites are dominated with species associated with high water tables such as willows, reed canary grass, and skunk cabbage. The final vegetation type, disturbed, was dominated with invasive species such as Himalayan blackberry and Scotch broom. Some trees are also found in this area such as red alder, douglas fir, western red cedar, and black cottonwood.

As a result of literature searches and field assessments, this site provides potential habitat for ten federally (Species at Risk Act or SARA) and/or provincially listed plant and animal species:

- Northern water-meal, provincially red listed
- Red-legged frog, SARA listed special concern, provincially blue listed
- Green heron, provincially blue listed
- Western screech owl, SARA listed special concern, provincially blue listed
- Dun skipper, SARA listed threatened, provincially blue listed
- Oregon forestsnail, SARA listed endangered, provincially red listed
- Pacific Sideband, provincially blue listed
- Pacific water shrew, SARA listed endangered, provincially red listed
- Trowbridge's shrew, provincially blue listed
- Snowshoe hare, provincially red listed

Habitat requirements and the potential for these species to be found on this site are summarized in the Bianchini Biological Services report including maps showing possible distributions. The site provides 2.1 hectares of potential habitat for the Red legged frog and Pacific water shrew within the floodplain vegetation type. The eastern two ravines on this site also provide an additional 2.9 ha. of potential habitat for Pacific water shrew and Trowbridge's shrew. The Floodplain Vegetation Type and the two eastern ravines within the Ravine Vegetation Type were rated moderate for Pacific water shrew due to the dense occurrence of skunk cabbage, suitable security cover and >250 M wetted length of the watercourses. The site also provides 5.4 ha. of suitable habitat for Oregon forestsnail in the riparian and upland forests.

This site also provides habitat for many terrestrial species as wildlife trees were noted throughout the site. The site also appears to act as a wildlife corridor as various wildlife sign and activity were recorded throughout the site. Some of the species detected include black-tailed deer, black bear, raccoon, coyote, beaver, and various passerines. This site also has potential breeding/roosting habitat for many bird species as well as various bats.

### **Surface water quality and hydrology**

Water flowing through the ravines and downstream (south of Highway 7) is comprised of stormwater from urban development situated upland of the site and from groundwater seeps within the ravines. It is expected that water quality entering via the storm water systems will contain pollutants typical of urban runoff including hydrocarbons and heavy metals from vehicles, chemical products for preventing freezing and snow accumulation on roads, and other chemical pollutants such as garden related fertilizers and herbicides. Groundwater sources would be expected to be relatively free of urban pollutants. Due to the influence of un-detained storm flows entering the ravines, the magnitude and frequency of peak flows are expected to be higher compared to natural conditions as the stormwater entering the ravines has not been treated with any stormwater BMP's that would reduce the frequency of high water events within the ravines. This is suggested to be the reason for observed instabilities within the ravines.

While flows entering into the ravines may be flashy and water quality may be somewhat degraded due to the influence



of untreated urban stormwater, it is expected that water quality would improve and flows would be more stable downstream of the site after flowing through ravines and wetland areas. The absence of a defined channel through the wetland and the presence of a small defined and stable channel below the wetland indicate that flows are significantly moderated by the wetlands. Juvenile coho salmon have been found rearing downstream of the subject site an indicator of relatively suitable water quality and adequate flow regimes.

### **Soils**

A portion of the site located easterly of the most eastern ravine was formerly used as a Rod and Gun Club. Site (soil) testing (Stage 1 and 2 Environmental Site Assessments) in this area has confirmed that approximately 800 cubic metres of potentially contaminated soils were identified for removal from the site; approximately 125 metres east of the east ravine.

### **Air quality and noise**

The site is situated within the District of Mission and along the Highway 7, a major connector for traffic entering the District from the west. Periodic upgrades (widening) to Highway 7 from several kilometres west of the Project site and immediately adjacent to the site have been undertaken to provide for increases in traffic entering the District from the west.

Given the existing setting and ambient environment It is expected that existing noise levels and air quality would likely be consistent with those typical of similar urban areas within the Lower Mainland Area.

### **Socio-economic and cultural environment**

#### **Land use**

The existing properties (six) are privately owned. The properties are currently designated for designated Service Commercial and Residential Zoning in the District of Mission's Official Community Plan.

The purpose for infilling the ravines floodplains and riparian areas is to allow for commercial and residential urban development of the entire site as opposed to limiting development to the previously disturbed area situated east of the ravines. This additional development space resulting from the infilling works has been deemed to represent approximately 6.4 additional hectares.

While the local government has not officially endorsed the project (infilling works) and the expansion of the developable area, the District of Mission Economic Development Office provided DFO with an economic rationale dated January 20, 2010 (Appendix Q) to be considered during the course of DFO's review of the project.

#### **First Nations archaeological and cultural resources**

The Sto:lo Research and Resource Management Centre conducted an archaeological impact assessment of the site (Appendix V). After undertaking extensive field surveys, eight areas of archaeological potential were identified and subsurface tested. Subsurface testing yielded negative results for all eight areas. No archaeological features or materials were identified in the study area as a result of the tests.

## **26. Factors and Scope of Factors Considered:**

Factors considered in the environmental assessment, pursuant to Section 16 of CEAA, are as follows:

- The environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in conjunction with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;
- The significance of the environmental effects referred to above;
- Comments from the public that are received in accordance with CEAA and the regulations;
- Measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project; and
- The need for, and the requirements of, any follow-up program in respect of the project.

Environmental components potentially affected by the project, as scoped by DFO, include:

- Surface water quality;
- Hydrology;

- Vegetation resources;
- Fish and fish habitat;
- Wetlands: and,
- Wildlife including species at risk.

The assessment of potential effects of malfunctions or accidents included:

- fuel spills from machinery used to construct the Project; and

The assessment of potential effects of the environment on the project, as scoped by DFO, included:

- extreme weather events.

The assessment of cumulative effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out included:

- previous and ongoing urban and linear development including urbanization as per the Cedar Valley Management Area and upgrades (widening) to Highway 7 in the vicinity of the Project site and losses of wetland habitats

## 27. Environmental Effects:

### Surface Water Quality

Construction phase: the potential effect to surface water quality is elevated turbidity and suspended solids during the construction phase involving significant land grading and fill deposit activities required to level the site suitable for the proposed commercial and residential development. This potentially occurs as a result of disturbance and erosion of surface soils, which then transport downslope to downstream areas. Any potential sediment transport may adversely effect the tributary stream including fish such as juvenile coho salmon and other fish species, located immediately south and downstream of the site, and the Silverdale Creek wetlands situated immediately west of the Project site. Adverse effects to these areas would generally entail infilling of the watercourse and wetland areas reducing the amount of wet habitat available for fish and amphibians. Construction activities may also result in the release of chemical deleterious substances from machinery use caused by leaks and / or spills to downstream areas such as the tributary stream, Silverdale Creek, and the Silverdale Creek Wetlands.

Commercial and residential development activities: may also potentially contribute particles or sediment to downstream and adjacent areas. This development will also have the potential to contribute a number of pollutants that are typical of urban developments such as the following: hydrocarbons, heavy metals, and lubricants from vehicular traffic; winter road maintenance chemicals; salts and sand; and, landscaping products such as fertilizers and herbicides.

### Loss of the wetland areas

The existing wetland areas at the Project site currently functioning to treat or sequester pollutants from the stormwater that currently enters the ravines will be eliminated as a result of the Project. The elimination of the wetland areas and their corresponding water quality treatment functions will likely have some adverse effects on the quality of water currently flowing through the site and connecting to downstream areas flowing from the ravines and into downstream fish bearing watercourse (the tributary stream).

Potential water quality impacts to the tributary stream, Silverdale Creek and the Silverdale Creek Wetlands include:

- Increased turbidity;
- Increased suspended solids;
- Changes in temperature;
- Decreased dissolved oxygen;
- Increased chemical pollutants; and,
- Increased nutrient loading.

### Hydrology

Potential impacts to hydrology (flows) in the tributary stream, Silverdale Creek, and the Silverdale Creek Wetlands include the following:

- Increased frequency of high flow events;
- Increased magnitude of high flow events; and,
- Reduced base flows during summer low flow periods.

## Vegetation Resources

As described earlier in this report the vegetation found on this site can be classified into four general categories: Upland Vegetation type, Ravine Vegetation Type, Floodplain (wetland) Vegetation Type, and Disturbed Vegetation Type. The upland vegetation type covers approximately 1.6 ha. of the site and consisted of mostly Bigleaf Maple, Red Alder, Salmonberry, Indian Plum, Red elderberry, bleeding heart, stinging nettle, youth on age, and sword fern. The ravine vegetation type occurs in three places on the site and on steep sided slopes (60-70%). The major species found here include western red cedar, bigleaf maple, western hemlock, salmonberry, and sword fern. The Floodplain Vegetation type occurs at the base of the three ravines located within the project site. These sites are dominated with species associated with high water tables such as willows, reed canary grass, and skunk cabbage. The final vegetation type, disturbed, was dominated with invasive species such as Himalayan Blackberry and scotch broom. Some trees are also found in this area such as red alder, Douglas Fir, Western Red Cedar, and black cottonwood.

All existing vegetation (trees, shrubs, and ground cover species) will be permanently eliminated from the Project site.

## Fish and Fish Habitat

Potential effects of the project on fish and fish habitat are summarized below.

The proposed development will result in the permanent elimination of approximately 9,600 M<sup>2</sup> of wetland habitat; 500 M<sup>2</sup> of instream habitat; and, 53,900 M<sup>2</sup> of riparian habitat associated with the two eastern ravines. An additional approximately 1.1 hectares of wetland may also be eliminated associated with the western ravine adjoining Silverdale Creek wetlands. It must be noted that some of the 1.1 ha. at the western edge of the Project site could be left undisturbed, which would depend upon the outcome of the stormwater planning process, as the stormwater pond proposed to be located in this area maybe relocated if deemed necessary, as indicated by the Proponent.

The Project footprint will result in the direct loss of food and nutrient habitat that supports fish rearing (salmon) areas downstream of the Project site. This loss of food and nutrient habitat will reduce the amount of food and nutrients available to fish for foraging including rearing coho juveniles in the tributary stream (documented) and other fish species during freshet, as well as the lower reaches of Silverdale Creek situated downstream of the site. Additionally, as referenced in the water quality and hydrology sections of this report, water quality and hydrology in the tributary stream and the Silverdale Creek wetland will potentially be impacted due to the construction phase and ensuing urban development proposed for the Project site. If these effects occur then there will likely be a reduction in the capacity (productivity) of the habitat to support fish.

## Wetland habitat

As currently proposed the Project would result in the permanent elimination of approximately 2.1 ha. of wetland habitat.

Wetlands situated south of the site and Highway 7 will not have any direct disturbances or effects. However, elimination of the existing wetlands at the site that currently treat stormwater entering the ravines will be eliminated. This reduction in wetland habitat may potentially result in the following adverse effects to downstream areas:

- Sedimentation;
- Changes to water temperature;
- Decreased dissolved oxygen;
- Increase in nutrient loading;
- Increase in chemical pollutants; and,
- Hydrological effects including a decrease in base flows.

The construction and operational activities (urban use) associated with the Project may result in the following potential adverse effects to the Silverdale Creek Wetlands:

- Loss of wetland habitat and associated riparian areas due to infilling associated with construction of a stormwater detention pond and ravine slopes;
- Sedimentation;
- Changes to water temperature;

- Decreased dissolved oxygen;
- Increase in nutrient loading;
- Increase in chemical pollutants; and,
- Hydrological effects including a decrease in base flows.

Wetlands are important environmental and ecological features that provide significant environmental values for fish, wildlife biodiversity, water quality, and air quality.

Environment Canada has indicated in their December 22, 2011 letter (Appendix I) that,

*“**The Project occurs in an area that has experienced critical wetland losses.** Appendix A provides a summary by Ducks Unlimited Canada (DUC) of the recent state of the wetland environment in the Fraser Delta and Valley areas of British Columbia (85% of wetlands lost with the remaining 15% under threat). Furthermore, the project falls within an area of high wetland loss, as identified in the Map on page 27 of the ‘The Federal Policy on Wetland Conservation – Implementation Guide for Federal Land Managers.’”*

**The Project would impact wetlands that are ecologically important to the region, within the Lower Mainland of British Columbia. For example:**

*The proposed project occurs in an area defined by the Pacific Coast Joint Venture as priority wetland conservation areas for migratory birds.*

*The limited vegetation data provided by the Proponent indicates the probable presence of provincially at-risk wetland ecological communities within the Project footprint. “*

And,

*“The project footprint largely falls with an area identified as a Priority Conservation Site as part of the Georgia Basin Ecosystem Initiative (see area labeled Silverdale Creek lowlands in Appendix B). The District of Mission and DUC have secured properties within this priority site (these properties are immediately adjacent to the Project site) for the purposes of habitat conservation with the support of public funds.”*

The subject proposal would eliminate approximately 2.1 hectares of wetland including wetland contiguous with Silverdale Creek. Wetlands in the Fraser Valley continue to be impacted through unavoidable impacts associated with projects such as the Highway 7 widening project.

Environment Canada further indicates that,

*“In order to achieve a no net loss of wetland functions, it is advised that three mitigation strategies be used. In hierarchical order, these strategies are:*

- a. Avoidance of impacts;
- b. Minimization of unavoidable impacts; and,
- c. Compensation for unavoidable impacts.

*Based on the information provided to date, CWS-EC is of the opinion that the mitigation hierarchy of avoidance, mitigation and compensation has not been sufficiently applied to this Project.*

*Avoidance of impacts is particularly prescribed for wetlands designated as ecologically or socio-economically important to a region and on or near wetlands that discharge into important aquatic and habitat systems. The Proponent has not, to the knowledge of CWS-EC, made documented efforts to avoid Project impacts on wetlands, including the exploration of siting or design alternatives.”*

And,

*“Through direct loss of wetlands and associated riparian areas on the Project site and indirect adverse impacts to wetland functions on the adjacent Silverdale Wetland properties, the project, as proposed, will adversely impact wetlands that support species at risk and migratory birds. Given the high level of wetland loss in the region, from a cumulative effects perspective the project has the potential to result in significant adverse effects to wetlands.*

*Avoidance of these impacts is the first best approach recommended by CWS-EC."*

In summary, the Project may potentially result in significant adverse effects. While adverse effects may be mitigated it is unclear to what extent impacts can be mitigated. The Proponent has indicated their commitment to ensure potential impacts to the Silverdale Creek wetlands are mitigated. However in the absence of a substantial change in design such as relocating the proposed stormwater pond and fill slope from the western ravine, mitigating impacts to the Silverdale Creek wetlands would be considered difficult to accomplish. Application of the avoidance or minimization alternatives per the FPWC would certainly reduce the risks to on-site and neighbouring wetlands.

With respect to determining significance of direct adverse effects of the Project on wetlands the following analysis has been carried out:

- Magnitude of the adverse environmental effect

Moderate – while the Project will not result in complete elimination of wetland function in this area, a substantial (approximately 2.1 ha. (15%)) portion of the remaining wetland will be eliminated and neighbouring wetlands may also be adversely affected.

- Geographic extent of the adverse environmental effect

Low to moderate – on a regional perspective the potential loss of wetland function may be low; however from a more local perspective the extent of loss may be considered to be somewhat broader in that the potential impacts extend beyond the project foot print and into neighbouring wetlands.

- Duration and frequency of the adverse environmental effect

Permanent – the Project is expected to be a permanent feature, and while some potential impacts such as those resulting from the construction phase may be temporary, many of the potential effects are expected to be permanent.

- Degree to which adverse environmental effects are reversible

Low to moderate – once the Project has been completed it is unlikely that the potential impacts of the Project can be reversed. The project is proposed as a permanent structure and does not include any decommissioning; therefore adverse effects resulting from the footprint of the Project will not be reversible. Any potential impacts to neighbouring wetlands caused by the effects of stormwater may possibly be mitigated; however this may be very challenging and not practical to achieve once the Project has been completed.

- Ecological context

These wetlands have significant environmental values for wildlife including federal and provincially listed species, water quality, air quality, migratory birds and fish. The neighbouring wetland properties situated immediately west and contiguous with the wetland along western edge of the Project site was deemed important and purchased by the District of Mission and Ducks Unlimited Canada in order to ensure the protection of these wetlands. Information suggests that wetlands in this region / area have been previously and significantly impacted; an 85% reduction in wetlands.

- Cumulative effects

Potentially Significant - Information suggests that wetlands in this region / area have been previously and significantly impacted; an 85% reduction in wetlands. Unavoidable impacts to these wetlands has already occurred as a result of the Highway 7 widening project located adjacent to the Project site. Further, Rosenau et al (2005) discusses the land use changes in the Fraser Valley that have occurred whereby lands that provided important aquatic habitat such as wetlands have been drained, dyked and / or filled in order to accommodate commercial and residential development.

Based upon the ecological importance of wetlands, the historical (cumulative) impacts to wetlands in the Fraser Valley and wetlands in the immediate vicinity of the Project, the magnitude, duration and irreversibility of the direct adverse effects to wetlands that will likely occur as a result of this Project, the potentially indirect adverse effects to neighbouring wetlands including the Silverdale Creek wetlands, the advice provided by Environment Canada, and the guidance within the FPWC, this project will potentially result in significant adverse effects to wetlands.

### **Terrestrial Habitat Values**

The proposed project will result in the permanent elimination of approximately 7.5 ha. of ravine, upland and wetland habitat including the associated riparian areas. All existing terrestrial habitat values including SARA listed wildlife species and their habitat at the Project site as described in the Environmental Description section of this screening report will be permanently eliminated.

- This includes: 5.4 hectares of potential Oregon forestsnail habitat as more than fifty shells (of dead snails) were

detected within upland and ravine vegetation areas;

- This site also provides 2.1 hectares of potential habitat for the Red legged frog and Pacific water shrew within the floodplain vegetation type.
- The eastern two ravines on this site also provide an additional 2.9 ha. of potential habitat for Pacific water shrew and Trowbridge's shrew.
- The Floodplain Vegetation Type and the two eastern ravines within the Ravine Vegetation Type were rated moderate for Pacific water shrew due to the dense occurrence of skunk cabbage, suitable security cover and >250 M wetted length of the watercourses.

The following information was provided to DFO regarding potential adverse effects on wildlife at the Project site from the Ministry of Forests, Lands, and Natural Resource Operations (FLNR) including OFS in the email from Josh Malt to DFO, dated June 17, 2011 (Appendix K) and the memo prepared by Josh Malt, dated September 19, 2011 (Appendix L).

- Forested hillsides such as this site are likely the last remaining refuge sites for OFS;
- It is important that the site be protected from development impacts in order to help prevent extirpation of Oregon forestsnail;
- These and other similar sites are absolutely critical to the long term persistence of OFS and because urban and agricultural development has already eliminated the majority of suitable habitat;
- Strongly urges avoiding development of these and similar sites;
- And instead suggests the Project site be properly managed and restored to ensure the persistence of species at risk on site; and,
- This is of particular importance at locations such as the Wren Creek site, where high densities of OFS were found, and where a relatively large and un-fragmented patch of suitable habitat exists.

Additional information provided by the proponent suggest the occurrence of OFS is much higher than originally suggested (i.e. 35 sites) by FLNR. This information was agreed to by FLNR in a letter to DFO dated December 2, 2011 (Appendix N).

The following information was provided to DFO regarding potential adverse effects on wildlife at the Project site from Environment Canada including OFS in letters to DFO dated August 15, 2011 (Appendix F), October 20, 2011 (Appendix G) and December 22, 2011 (Appendix I).

- The Project as currently proposed would require the permanent removal of 5.4 ha. of currently occupied habitat suitable habitat for OFS.
- This Project would result in likely adverse environmental effects of uncertain significance to OFS.
- Environment Canada's recommendation is that actions to allow the Project to proceed as currently proposed not be carried out by the Department of Fisheries and Oceans.
- Environment Canada advises that, based on the current state of scientific knowledge, it is not in a position to advise that the Project, as currently proposed, would not result in significant adverse environmental effects to the OFS. With respect to direct effects, this is summarized as below:

1. Project impacts to individuals, residences and habitat

- Provincial OFS BMPs do not recommend salvages for this species
- Habitat restoration techniques have not been tested or evaluated

2. Status of the species as Endangered on Schedule 1 of SARA

- Ongoing treats to the species
- Lack of scientific information regarding population trends and thresholds

3. Evaluation of significance

- Before mitigation:

Direction: negative

Magnitude: high

Geographic scope: local

Frequency: continuous

Duration: permanent

VEC resilience: low

- Likelihood of proposed mitigation success (salvage):  
Low to uncertain
- Likelihood of proposed mitigation success (habitat compensation/restoration):  
Moderate to low for habitat suitability  
Low in achieving no-net-loss

Given uncertainties regarding OFS population trends and thresholds, Environment Canada is not in a position to quantify the potential for the Project to cause significant cumulative environmental effects. The federal recovery strategy which is being developed by the Province of British Columbia, for consideration to be adopted as a federal recovery strategy under SARA, will provide additional information that will assist in the evaluation of cumulative environmental effects.

On the basis that the likelihood of an impact is high (OFS habitat would be removed, salvages would be conducted), there is uncertainty regarding OFS population thresholds and trends, and there is uncertainty regarding effectiveness of proposed mitigation (uncertainty with respect to mortality risk to adults, juveniles and egg, and habitat restoration effectiveness), Environment Canada concludes the risk of viability of the local OFS population under the current project proposal is uncertain to potentially significant. Environment Canada's recommendation is that OFS, individuals, residences and habitat on the proposed Wren Street Project site be protected through the use of avoidance, protective buffers and connectivity corridors, as outlined in the OFS BMPs prepared by the BC Ministry of Environment (2007), and there is uncertainty regarding the success of proposed mitigation, that the risk to viability of the local OFS population under the current Project proposal is uncertain to potentially significant.

Detailed comments were not provided by EC or the Province regarding other listed species, however we recognize that the Project site contains habitat for other listed wildlife species that would be permanently eliminated as a result of the Project. DFO also acknowledges that while habitat compensation has been proposed that will potentially mitigate some of the impacts for these species, much of the habitat at the compensation site is already in existence and therefore we can expect that there may be residual overall losses of habitat attributed to the other species after considering the application of proposed mitigation.

In summary, the Project will result in the permanent elimination (high magnitude) of habitat suitable for several provincially and federally listed wildlife species. The proposed compensation plan affords for the protection of existing habitat for many of these species and enhancement of pre-disturbed areas within the compensation site. However, while the enhancement works will result in some benefits to many of these species, a large portion of the compensation is comprised of protecting existing habitat already suitable for these species. In particular and as per information provided by federal and provincial listed wildlife species at risk experts, the Project after consideration of the proposed habitat compensation for Oregon forestsnail, the Project will result in a net loss of Oregon forestsnail habitat. Additionally, the proposed protection of OFS individuals is to salvage and relocate individuals from the Project site to the compensation site. Provincial and federal experts have advised that this practice is untested and should not be considered a viable option for mitigating harm to OFS individuals.

Overall, the project could result in likely adverse effects of uncertain significance to Oregon forestsnail and will likely result in adverse effects to other listed wildlife species at risk.

#### Migratory Birds

Impacts to migratory birds will be mitigated through adherence to the mitigation measure listed on pages 5 & 6 of the Environment Canada letter dated December 22, 2011 (Appendix I).

#### **Accidents or malfunctions during construction resulting in fuel spills**

Fuel leaks or spills may result in the deposit of hydrocarbons into nearby stream channels and wetlands. Hydrocarbon deposits would have adverse effects on wetland and riparian vegetation including wildlife and fish and fish habitat. Subsection 36(3) of the federal *Fisheries Act*, administered by Environment Canada, prohibits the discharge of deleterious substances to waters frequented by fish, or to a place where those substances might enter such waters.

#### **Cumulative effects**

According to the Cumulative Effects Assessment Practitioners' Guide (Canadian Environmental Assessment Agency; 1999): cumulative effects are changes to the environment that are caused by an action in combination with other past, present and future human actions. Specifically, cumulative effects assessments are typically expected to:

- assess effects over a larger (i.e., "regional") area that may cross jurisdictional boundaries; [Includes effects due to natural perturbations affecting environmental components and human actions.]
- assess effects during a longer period of time into the past and future;
- consider effects on Valued Ecosystem Components (VECs) due to interactions with other actions, and not just the effects of the single action under review;
- include other past, existing and future (e.g., reasonably foreseeable) actions; and
- evaluate significance in consideration of other than just local, direct effects.

Effects of this Project as well as effects of other projects and trends will be considered in predicting significance of potentially adverse effects of this Project on the environment. The current Project in conjunction with previous and future developments within the Silverdale Creek watershed and the tributary stream will not result in insignificant risks on hydrology, water quality, fish and wildlife, and wetlands.

#### Urbanized area north of the Project

Historical (existing) urban development in areas generally north and upland of the Project site have created large areas of impervious surface (such as roads, driveways, parking lots, roof tops) that have resulted in un-quantified hydrological and water quality impacts to flows in the ravines at the Project site as well as downstream areas such as the wetland and tributary stream. Reports and information provided by the Project Proponent for this assessment have suggested that the instabilities within the ravines are likely caused by these hydrological changes induced by discharging untreated, undetained stormwater into the ravines. While these flows are untreated prior to entering the ravines on the Project site, the channel and wetland south and downstream of the site continues to provide fish habitat suitable for fish including juvenile salmon. It is expected that this habitat continues to have adequate flows and water quality for sustaining fish at least partially because of the hydrological and water quality buffering effects of the floodplain/wetland areas located at the bases of the ravines on the Project site. Pollutants in the water entering the site are likely filtered by the floodplain/wetlands and wetlands likely function as a sponge absorbing water during rain events and then discharging clean water slowly during dry periods which functions to maintain adequate flows and water quality for rearing fish during dry periods. A potential risk inherent with this Project is that filling and developing this site and thereby eliminating the natural wetland buffering functions described above may adversely impact upon the flow and quality of the water currently flowing through the site and to the channel and wetland habitat south (downstream) of the Project site.

While the Project will prepare a stormwater management plan intended to mitigate potential impacts to water flow and water quality it remains uncertain as to the overall effectiveness of such a plan. One of the complicating factors for this Project, is that not only is a large impervious area being created in the catchment area of the tributary stream but a natural buffering system (the wetlands) that appears to be functioning to minimize impacts from existing stormwater to downstream areas will be eliminated by this Project. Therefore, not only does the stormwater management plan have to meet the intended objectives of minimizing impacts associated with the new impervious area caused by the new development, but the plan must also replicate the natural buffering functions of the existing wetlands that will be lost (approximately 9600 M<sup>2</sup>). Additionally, when considering this risk we must also consider that if the stormwater plan does not provide the intended mitigation and the Project results in adverse effects to the tributary stream, it would be impractical to retrofit the Project in a manner that would reverse those adverse effects.

An additional risk with regard to the water quality of the habitat south of the Project site is the possible production and transport of iron precipitate that could potentially occur when placing large amounts of fill in areas that have groundwater sources such as the wetlands. Iron precipitate or flocculent can have a smothering effect on habitat that produces food organisms such as insects for fish. Once again, while there may be engineering methods that can be incorporated into the Project plan to mitigate these effects, the effectiveness and outcome of such mitigation measures remains somewhat uncertain. As with the other stormwater plan and mitigation, if the mitigation plan does not work to mitigate these potential adverse effects, it will be impractical to reverse the effects once the Project is complete.

It is acknowledged that the Proponent has indicated that the Project will be designed in a manner such that all potential stormwater impacts to downstream and neighbouring fish habitat and wetlands will be mitigated by the



implementation of their stormwater plan. However, we must also acknowledge there is always some uncertainty regarding the effectiveness of such plans that should be considered when sensitive environments are potentially at risk.

Further, these risks also pertain to the Silverdale Creek Wetlands.

### The Cedar Valley Management Area

The Cedar Valley Management Area is a large rural area situated in the upper watershed of Silverdale Creek in Mission, B.C. This area is currently under development. DFO and the local government have entered into an agreement (the Plan) that will guide and direct the development of this Area, by among other things, prescribing measures to protect the riparian areas and existing hydrology and water quality of existing wetlands and watercourses. The Plan recognizes that the urbanization of the area will result in some encroachment into, loss of, and impacts to, fish habitat. Consequently, it identifies the need for providing habitat compensation in the Silverdale Creek watershed in order to achieve no net loss of fish habitat productive capacity. While the District of Mission has developed a comprehensive stormwater plan to support the Plan and to mitigate effects to hydrology and water quality, it is likely that some changes to hydrology (increase in magnitude and frequency of peak flows, reduction in base flows) and to water quality will occur as a result of the urbanization of this area.

Habitat compensation requirements for the Plan have been previously approximated to be as much 12 ha. To date the District of Mission has not identified enough suitable compensation area within the Silverdale Creek watershed to satisfy no net loss for the fish habitat losses associated with the Plan. Therefore from a cumulative effects perspective with regard to fish habitat one must consider that there may be a limited amount of potential compensation area available within the Silverdale Creek watershed and while this Project has identified an area within the watershed suitable for fish habitat compensation, using this site to compensate for the impacts associated with this Project could impact upon the ability of previous projects and agreements to fulfill their fish habitat no net loss requirements in the Silverdale Creek watershed.

### Highway 7 upgrades

Recent works (widening) undertaken to Highway 7 immediately adjacent to and west of the Project site by the BC Ministry of Transportation and Infrastructure has resulted in losses of fish and wildlife habitat including wetland habitat and potential adverse effects to the water quality of neighbouring wetlands.

DFO issued an Authorization under s. 35(2) of the *Fisheries Act* for the Highway 7 upgrade works, which required habitat compensation to achieve no net loss of habitat. As part of the Authorization the Proponent entered into an agreement with DFO to provide funding in order to compensate for habitat losses resulting from the Highway widening project. A portion of this habitat compensation works has already been completed in the Silverdale Creek Wetlands; however, a portion of the required compensatory works remains outstanding. The project steering committee is currently seeking to purchase lands suitable to undertake the remainder of the compensatory works required under the DFO Authorization. Some of the habitat compensation works may have to be carried out in another watershed(s) due to a shortage of available compensation sites in the Silverdale Creek watershed. Therefore, with the outstanding Highway 7 and Cedar Valley Management Area compensation requirements there may already be an actual habitat deficit within the Silverdale Creek watershed that could be further complicated by this Project which as proposed would utilize a potential compensation site that could be used as compensation for these other projects.

Therefore it is likely that in considering this Project along with past and future developments that there may be cumulative adverse effects on fish habitat that cannot all be mitigated through the application of habitat compensation, for the Silverdale Creek watershed. This outcome would not be consistent with the Silverdale Creek sensitive streams designation.

Overall, while the Highway 7 project has been authorized by DFO and attempts to achieve no net loss of fish habitat, it is likely that some residual effects to wetlands have occurred as a result of the project, which were a result of unavoidable direct impacts (losses) to existing wetlands. Specifically, existing wetlands may be enhanced but additional or new wetlands have not been created, thereby resulting in an overall net loss of wetland area.

The proposed Project occurs in an area that has experienced critical wetland losses. The backgrounder attached to Environment Canada's letter dated December 22, 2011 (Appendix I) reveals an 85% loss of wetlands in the Fraser Delta and Fraser Valley areas of British Columbia and indicates that the remaining 15% of wetlands are threatened. In addition, the Federal Policy on Wetland Conservation – Implementation Guide for Federal Land Managers has

identified the Project area as an area of high wetland loss. Thus, the proposed Project, in conjunction with the widening of Highway 7, cumulatively account for a further loss of wetland habitat in an area that has already been identified by the Federal Policy on Wetland Conservation as an area of high wetland loss.

### **Effects of the Environment on the Project**

Potential effects of the environment on the project include extreme weather events such as heavy rains which may cause extensive erosion of construction materials (soils) that may sedimentation of fish habitat downstream of the Project site and an increase in turbidity levels of water discharging from and around the Project site.

### **28. Mitigation Measures:**

The Proponent has proposed a compensation plan in the Scott Resource Services Inc. report titled "Proposed conceptual compensation plan for the Wren Creek development, Mission, B.C." dated January 26, 2011 (attached as Appendix B) which generally entails purchasing the Sun Valley Trout Park Inc. (the compensation site), a group of properties located offsite but relatively close to the Project site. The compensation site is within the Silverdale Creek watershed and includes a portion of the Silverdale Creek main stem channel. The properties form part of the District of Mission's acquisition strategy of the Silverdale Creek Corridor.

The compensation site includes significant opportunities for enhancement of salmon populations: through the decommissioning of an existing RV Park; construction of a relatively large area of off channel habitat; changing existing trout rearing ponds and channels into natural watercourses and ponds; and connecting existing channels and ponds currently disconnected as a result of the commercial operation of the trout farm and hatchery.

The Proponent has indicated that they will ensure the entire properties at the compensation site will be protected in perpetuity although the exact mechanism of the protection has not been defined to date. Discussions have suggested that the property(s) could be gifted to a third party(s) such as the District of Mission and / or a land trust or restrictive covenant. The total area that would be committed as habitat compensation is approximately 99,055 M<sup>2</sup>.

The compensation site was formally identified in the DFOs "Lower Fraser Valley Streams Strategic Review (1999)" and recommended for acquisition in the "District of Mission (DoM) Parks, Trails and Bicycle Master Plan (August 2009)".

Additionally, the Proponent suggests the compensation site offers opportunities to protect existing wildlife habitat including habitat for SARA listed species including: Oregon forestsnail, Red legged frog, and Pacific water shrew, and Western screech owl and elaborates further in the Bianchini Biological Services report "Response to Joshua Malt email of June 17, 2011 review comments regarding environmental impacts associated with proposed development at Wren St. and Highway 7 in Mission, B.C." (Appendix H). The Proponent also suggests that existing disturbed areas at the compensation site may be restored and other areas may be enhanced and that the productivity / suitability of the habitat for the listed wildlife species can be enhanced.

### **Fish and Fish Habitat**

The Proponent proposes to mitigate for the losses of fish habitat at the Project site by protecting and enhancing the habitat at the compensation site as follows:

- creating and enhancing 8,800 M<sup>2</sup> of instream habitat (ponds and channels);
- and providing 50,300 M<sup>2</sup> of riparian habitat associated with McRae Brook; and,
- and enhancing 8,575 M<sup>2</sup> of degraded riparian habitat adjacent to Silverdale Creek on the west side.

A large portion of the proposed riparian habitat will be associated with McRae Brook. McRae Brook is a small tributary stream, which enters the site from the north and generally flows along the toe of the west escarpment, through constructed channels, culverts and ponds before entering into Silverdale Creek. While the forested area on the slope adjacent to McRae Brook may currently be considered fish habitat in accordance with the Riparian Areas Regulation (B.C. Fish Protection Act), according to the current owner of the site, historically McRae Brook entered into Silverdale Creek close to the north boundary of the site, and did not flow or follow its current path adjacent to the toe of the escarpment.

While much of the compensation site is already fish habitat or has productive capacity the construction of rearing ponds and spawning riffles could offset fish habitat losses resulting from impacts to Creeks ravines at the Project site.

It is also important to note that the enhancement or creation of fish habitat (fish habitat compensation) has had varying success rates in the past in terms of meeting intended objectives of no net loss of fish habitat productivity. The Quigley and Harper study in 2005 reviewed 16 projects and revealed that 63% of those projects resulted in net losses in habitat productivity when comparing losses versus gains of fish habitat. However, it is recognized that this compensation site appears to be an appropriate site to expect a positive outcome for the proposed construction of fish habitat.

Additionally, the Proponent proposes to develop an Environmental Management Plan (EMP) including a monitoring plan to mitigate potential construction related adverse effects and an integrated stormwater management plan (ISMP) to mitigate the potential urban related adverse effects such as changes in hydrology to downstream wetlands and watercourses and water quality degradation. As previously discussed in this report the effectiveness of a stormwater plan in mitigating potentially adverse effects to flow and water quality remains uncertain, and potential adverse effects to fish habitat and wetlands situated downstream of the Project site would be difficult to reverse, if they occur.

A stormwater treatment pond is proposed to be constructed along the western edge of the property and is proposed to potentially provide enhancement benefits to the Silverdale Creek Wetland as well as further treat new stormwater generated at the site. Typically stormwater treatment facilities such as stormwater ponds are not located within sensitive environmental areas such as wetlands due to the pollutants that inherently enter such facilities and the ongoing maintenance requirements and machine access required to undertake maintenance of such facilities. Therefore stormwater ponds such as the pond being proposed for this Project are not typically considered as enhancement or habitat compensation features when assessing the potential for achieving no net loss of fish habitat.

### **Wetland habitat**

The compensation plan and compensation site does not include compensation for losses of wetland habitat that could occur as a result of the Project. However, in a January 14, 2010 letter to DFO the Proponent has committed to initiating a direct dialogue with owners of the adjacent wetlands to ensure avoidance and or mitigation of adverse effects. Total direct wetland impacts are expected to equal or exceed the 2.1 hectares of area reported as floodplain habitat in the Bianchini report. Area losses could potentially be lowered but still greater than 1.1 ha. should the proposed stormwater pond and fill slope in the western ravine be removed from the plan. Other wet / seep areas on forested benches in the ravines and an area immediately downstream of the Wren Creek outfall may also have wetland functions that would be impacted by the Project.

The compensation strategies proposed include the construction of a (approximately 0.5 ha.) stormwater pond and management area and extensive plantings in the upslope area at the base of the western ravine. It is also suggested by the Proponent that this area could be dedicated to the District of Mission as Parkland Dedication and may be developed as an extension of the Silverdale Creek Wetlands.

Details of the integrated stormwater plan (ISMP) for the Project, which would include the construction of this pond and enhancements have not been completed; the ISMP would be completed as part of or after a local government review and approval process has been completed and layout designs for the Project site are finalized. While the stormwater pond proposal is suggested as an enhancement, stormwater ponds typically do not provide good wetland habitat due to fluctuating water levels and introduction of pollutants. For this reason guidelines for stormwater management recommend that stormwater treatment facilities be located outside of wetland or riparian habitats. The Proponent has committed to ensuring that the Project will be planned / designed in a manner that will not result in any negative impacts to the Silverdale Creek wetlands. At this point there are no assurances with regard to the potential effectiveness of the stormwater plan in mitigating impacts to neighbouring wetlands. To address these uncertainties the Proponents has committed to, additional study, detailed design, follow-up monitoring, and adaptive management to minimize impacts to the Silverdale Creek wetlands..

The ISMP is also intended to mitigate potentially adverse effects to the wetlands situated south of the Project site. However, due to the extensive cut and fill activities associated with this proposal, and loading of extensive amounts of fill on top of the existing wetlands which are partially fed by groundwater, impacts to the wetland south of the site may be challenging to mitigate and may result in iron precipitates downstream of the site and within the wetlands.

Additionally, impacts to groundwater flows to the Silverdale Creek Wetlands may also be difficult to mitigate. The Silverdale Wetland is recognized as an important ecological feature. The underlying key component to the function of the wetland is water and maintaining a high water table. Activities that may potentially disrupt the flow of water to the wetland and water levels must be carefully considered, as any changes to water flow, level or water quality could have

significant impacts on wetland function. As part of the Proponents commitments to avoiding impacts to wetlands the collection of pre-project baseline data and follow-up monitoring will be required.

The standard guideline for planning projects and mitigating potentially adverse effects to wetlands is 'The Federal Policy on Wetland Conservation – Implementation Guide for Federal Land Managers' A hierarchy of wetland mitigation alternatives (see Table 1 from the guide below) is nested within the guide and serves to provide Managers and Proponents with recommendations regarding wetland mitigation alternatives. This hierarchy has not been applied by the Proponent for this Project, and therefore potentially significant adverse effects to wetlands that would be avoided or minimized through the application of the hierarchy remain outstanding.

**Table 1: The sequence of wetland mitigation alternatives**

1) Avoidance refers to the elimination of adverse effects on wetland functions, by siting or design of a project. Avoidance is recommended in all wetland conflict situations, but is particularly prescribed:

a) On or near wetlands designated as ecologically or socio-economically important to a region.

A number of jurisdictions have developed and applied evaluation systems that designate those wetlands that require a high level of protection by classification (for example, *Ontario Wetland Evaluation System*, Fisheries and Oceans Canada's *Habitat Conservation and Protection Guidelines*, *Key Mitigatory Sites in the Northwest Territories*), zoning, or legislated protection status, etc. Avoidance should also be practiced on or near wetlands that discharge into important aquatic and habitat systems.

b) In areas where wetland losses have been severe.

Wetlands on federal lands and waters in "areas of Canada where the continuing loss or degradation of wetlands has reached critical levels" or "due to local circumstances where wetland losses have been severe (see section II.3 and Appendix 2).

c) For projects with feasible alternatives.

That is, those projects not requiring access to a wetland, and where technically and economically feasible alternatives to the project or siting exist, that will result in no, or insignificant, adverse effects on wetland functions.

d) When significant adverse effects on wetland functions cannot be mitigated or justified.

That is, projects assessed as having significant adverse effects (as defined by *CEAA*) on wetlands, that cannot be mitigated (including consideration of the capacity for regeneration of wetland functions).

2) Minimization refers to the reduction or control of adverse effects to wetland functions through project modification or implementation under special conditions. Minimization should be practised when and only when adverse effects have been avoided as per (1) above.

3) Compensation refers to the replacement of unavoidably lost wetland functions, through enhancement or rehabilitation of existing wetlands, or, as a last resort, creation of new wetlands. Compensatory mitigation should be practised when and only when:

a) All possible avoidance and minimization measures have been applied;

b) The project justifies adverse effects or diminished functions and all possible mitigation has been applied; and,

c) The proponent provides evidence that functions can be effectively replaced when, where, and to what or to whom that are important.

Compensation cannot be achieved through the protection of another wetland, but rather involves the addition or improvement of wetland functions elsewhere.

In a letter dated January 19, 2012, (Appendix V) Environment Canada advised DFO that, "The proponent's response to Department of Fisheries and Oceans (DFO) dated January 14, 2012 referencing previously submitted plans doesn't provide the necessary evidence to enable EC to provide assurances at this time that there aren't significant effects. Similarly, if there are significant effects, EC is unable to determine whether or not they can be mitigated."

In addition EC advised that "DFO seek a clear commitment to action by the proponent to avoid, minimize and mitigate impacts to the extent possible using adaptive management."

## **Terrestrial Habitat Values including SARA listed wildlife species**

Adverse effects to SARA listed wildlife species noted in previous sections of this report, taken from reports provided by the Proponent include the following:

- Permanent loss of 5.4 hectares of potential Oregon forestsnail habitat as more than fifty shells were detected within upland and ravine vegetation areas;
- Permanent loss of 2.1 hectares of potential habitat for the Red legged frog and Pacific water shrew within the floodplain vegetation type.
- Permanent loss of an additional 2.9 ha. of potential habitat for Pacific water shrew and Trowbridge's shrew in the eastern two ravines.

The Bianchini Biological Services report dated June 29, 2011 (included in Appendix A) proposes two management options to mitigate impacts to wildlife including SARA listed species.

### *Option 1*

Avoid any development in the upland, ravine and floodplain vegetation types in order to protect habitat for SARA listed Oregon forestsnail, Red-legged frog, Pacific water shrew and Provincially Blue-listed Trowbridge's shrew. Any proposed development should only occur within the disturbed vegetation type. Implementation of this option will ensure habitat protection for the above mentioned species and demonstrates that all attempts are being made to meet the spirit of the BMPs.

### *Option 2*

If the implementation of option 1 is not feasible then habitat compensation and wildlife salvages will be required in order to mitigate the loss of habitat of the above mentioned species and other wildlife and vegetation species.

The proponent has indicated that option 1 is not feasible and therefore the Project is currently being reviewed under the conditions afforded under option 2.

### *More specifically*

#### For Oregon forestsnail (OFS)

The strategy(s) proposed for compensating for adverse effects (permanent elimination of 5.4 ha. of habitat suitable for OFS at the Project site) to OFS is as follows:

- Ensure protection of existing habitat suitable for OFS at the compensation site (approximately 6.2 ha);
- The habitat suitability for OFS at the compensation site has been demonstrated through the observations of shells throughout the forested slopes that dominate the area at the compensation site;
- The Bianchini Biological Services report concludes there has been limited historical disturbances within the forested portions of the compensation site and two specimens of OFS and one specimen of the provincially blue listed Pacific sideband were recorded near seepages within the forested portion of the study area;
- The Project site (Wren Creek) is currently disturbed and subject to urban impacts such as bike trails, dumping of urban refuse and encroachment of invasive plant species;
- There is no legislation currently protecting the site from further encroachment and degradation;
- The existing environmental conditions of the Project site and suitability of habitat for OFS into the future is questionable or uncertain; and,

- Given there remains some uncertainty regarding the persistence of the project site into the future, achieving protection of the compensation site in perpetuity is proposed to adequately compensate for losses of existing OFS habitat at the Project site.

Additionally, the compensation proposal includes the following enhancements of the previously disturbed / developed areas of the compensation site for OFS:

- Retain all bigleaf maples onsite wherever possible as earlier structural stages do not typically support OFS;
- Retain all existing stinging nettle growth;
- Install herbaceous plants (i.e. > stinging nettle) immediately adjacent to the location of the mature bigleaf maples that are present at the site; and,
- Install a combination of deciduous and conifer tree species (conifer dominated forests typically provides poor OFS habitat).

Compensation strategies for OFS are intended to mitigate effects on Pacific sideband.

Environment Canada and the B.C. Ministry of forests, Lands, and Natural Resource Operations have indicated the habitat compensation approach proposed will result in a net loss of habitat for OFS because the habitat compensation being proposed at the compensation site is generally the protection of existing habitat already deemed suitable for OFS.

Additionally, the experts suggest that habitat compensation should entail enhancing an area or site that is currently highly degraded, which the proposed compensation site is not. While this would be a more preferable approach, federal and provincial experts also caution that habitat restoration techniques for OFS habitat have not been tested and therefore even under ideal conditions where a degraded site is enhanced there remains uncertainty and risk associated with destroying existing suitable habitat and attempting to compensate for OFS habitat loss through implementation of untested enhancement techniques.

Consequently, federal and provincial experts suggest that in order to mitigate potentially adverse effects to OFS habitat, option 1 should be implemented whereby the Project is designed in a manner that avoids impacting existing OFS habitat. In this particular case that would mean avoiding developing within the wetland areas, the ravine areas and likely the majority of the upland areas, and generally limiting development to the disturbed portion of the site.

The Bianchini Biological Services report (included in Appendix A) also suggests that harm to OFS individuals can be mitigated through salvage and relocation. However, federal and provincial experts caution that this practice has not been tested and the current MOE Draft Best Management Practice's report suggests that salvage and relocation is not an appropriate mitigation technique; specific technical rationale for this advice is contained within the MOE report. Hence the federal and provincial experts suggest avoidance as the most acceptable mitigation measure to avoid causing harm to OFS individuals.

Other SARA and provincially listed species: Red-legged frog, Pacific water shrew, Pacific side band (snail)

#### For Pacific water shrew (PWS)

The strategy(s) proposed for compensating for adverse effects (in this case permanent elimination of 5.0 ha. of habitat suitable for PWS at the Project site) to PWS is as follows:

- The compensation site currently provides approximately 3.2 ha. of potential habitat for PWS;
- The 3.2 ha. of existing PWS habitat will be protected in perpetuity;
- Enhancement measures such as the addition of CWD and planting of desired vegetation species would provide high-rated habitat for PWS at the site;
- All non-conforming anthropogenic features (i.e. trailers, driveways, etc.) within 60 metres of Silverdale Creek (approximately 2.1 ha.) will be removed and the sites will be rehabilitated as fish and wildlife habitat.
- Install plants such that their location in combination with existing vegetation, natural terrain, existing and installed CWD will provide travel corridors;
- Install skunk cabbage along the banks of the watercourse;
- Plant devil's club and salmonberry which are riparian plant species favoured by PWS;
- Maintain existing native trees and shrubs and CWD; and,
- Thin any high density areas of red alder which limit understory growth.

Generally while the habitat compensation strategy does include enhancing degraded habitat (2.1 ha.) it appears that a considerable amount of compensation would be provided through the protection of existing habitat (3.2 ha.) at the

compensation site.

#### For Red-legged frog (RLF)

The strategy(s) proposed for compensating for adverse effects (in this case permanent elimination of 2.1 ha. of habitat suitable for RLF at the Project site) to RLF is as follows:

- It is likely that RLF and other amphibians rear within the same forested portions of the site that provides OFS habitat (6.2 ha.);
- The 6.2 ha. of existing RLF habitat will be protected in perpetuity;
- The existing trout ponds likely provide potential breeding habitat (approximately 0.9 ha.) for RLF and other amphibian species; and,
- Enhancement includes addition of streamside vegetation, CWD within the ponds and removal of any non-native predatory fish and amphibian species which would result in high-rated RLF and general amphibian breeding habitat.

Generally while the compensation strategy does include enhancing degraded habitat (0.9 ha.) as breeding ponds it appears that a considerable amount of compensation would be provided through the protection of existing RLF habitat (6.2 ha.) at the compensation site.

#### For Western screech owl (WSOW)

The strategy(s) proposed for compensating for adverse effects to WSOW is the protection of the compensation site, which includes 2.5 ha. of area currently suitable for WSOW. Additional compensation measures include creation of additional wildlife trees and installation of WSOW nest boxes.

Detailed comments were not provided by Environment Canada or the BC Ministry of Forests, Lands, and Natural Resource Operations regarding SARA listed species other than OFS. Comments from the federal and provincial experts on wildlife regarding the proposed mitigation of adverse effects to SARA listed species was limited to Oregon forestsnail. Environment Canada indicated they did not feel there was any justification to extend their review beyond OFS to other listed species based on the likely adverse residual effects to OFS that will occur as a result of this Project. Comments on WSOW were not provided.

### **Surface water and hydrology**

Details of the mitigation (stormwater plan) for potential effects to surface water and hydrology would be developed during the local government development application process.

The Proponent has committed to designing an integrated stormwater management plan (ISMP) that will satisfy the District of Mission's targets as they relate to the Ministry's Stormwater Planning Guidebook (2002), Beyond the Guidebook (2007), and DFO's Draft Urban Stormwater Management Guidelines (2004).

The stormwater plan would also consider implementing the following strategies:

- Relocation and detention of existing un-detained stormwater run-off from outfalls off Hillcrest Avenue to Turner Street;
- Un-detained stormwater run off from outfalls off Lapwing Crescent and Raven Avenue could be detained and subsequently released into roadside watercourses along Highway 7, where they would eventually flow to either the north and/or south side of Highway 7; and,
- Additional stormwater run off from the proposed Project may also be directed to the roadside watercourse along the north side of Highway 7 for bio-filtration; and,
- Construction of a stormwater pond along the western edge of the Project site at the base of the western ravine and adjacent to the Silverdale Creek Wetland.

The suitability of the above options and the potential for associated impacts such as reducing flows to habitats downstream of existing flows or the potential for new benefits or new adverse effects such as pollution or erosion to new discharge locations has not been assessed in detail.

The proponent has committed to completing and implementing an environmental management plan for the construction phase of the Project in order to mitigate potential adverse effects to the environment during construction.

### **29. Significance of Adverse Environmental Effects:**

The determination of whether the project is likely to lead to significant adverse environmental effects considered

guidance in the Canadian Environmental Assessment Agency reference guide entitled “Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects”, and the Environmental Effects and Proposed Mitigation as described in Section 27 and Section 28 of this Screening Report. As outlined in the CEAA guidance document, the significance of adverse environmental effects is based on the following criteria:

- Magnitude of the adverse environmental effect
- Geographic extent of the adverse environmental effect
- Duration and frequency of the adverse environmental effect
- Degree to which adverse environmental effects are reversible or irreversible
- Ecological context
- Cumulative effects

In determining significance of adverse environmental effects and for the following discussion, DFO considered all of the Project information provided by the Proponent including consultants reports, public comments, and input from federal and provincial experts regarding terrestrial habitat values including SARA listed species, information regarding previous and ongoing developments in surrounding areas, as well as in house expertise in relation to fish and fish habitat matters.

### **Fish and Fish Habitat**

Significant direct impacts to fish habitat located at the Project site will occur as a result of the Project. However, potential offsets to fish production may be realized through the enhancement of the compensation site with the construction of new ponds and channels as described in the Project Habitat Compensation plan.

The surrounding areas also have fish habitat and are known to provide important fish producing channels for fish including salmon. This includes the Silverdale Creek wetland situated immediately west of the Project site and which is contiguous with the western edge of the site, and the wetland and watercourse situated south of the site. These areas may potentially be adversely affected by the Project through changes in water flow and level (reduced in the summer) and water quality of the channels and ponds in the wetlands that provide important rearing areas for fish including salmon.

The existing condition at the site is somewhat unique in that untreated urban stormwater currently discharges to the site. The wetland areas located at the bases of the two eastern ravines act as sponges holding water during rain events and then releasing the water slowly downstream to salmon rearing areas during dry periods. It is also likely that the wetlands will filter pollutants that may have entered the site with the untreated stormwater. This function of the wetlands is believed to be very important to maintaining flows and water quality suitable for salmon rearing downstream of the site.

The Proponent has committed to developing and implementing a stormwater management plan that will mitigate all potential stormwater related impacts to downstream areas. However it must be recognized and taken into consideration that there is uncertainty with regard to the intended effectiveness of a stormwater management plan, and therefore uncertainty with respect to potential impacts to fish and fish habitat associated with the channel(s) south of the Project site as well as within the Silverdale Creek Wetland that may be caused by the Project. Potential losses of fish habitat resulting from the indirect effects of the Project to neighbouring fish habitat areas have not been quantified. If the Project results in indirect impacts to fish habitat, those impacts will be difficult and impractical to reverse.

In consideration of the above information it is expected that direct losses of fish habitat providing a source of food and nutrients to downstream areas can potentially be offset through the establishment and enhancement of the compensation site, however avoidance of potential indirect impacts to important salmon rearing areas neighbouring the Project site will require commitments to detailed design and integrated water management as well as follow-up monitoring and adaptive management.

### **Wetland habitat**

Environment Canada, as a Federal Authority with expertise on wetlands, has advised Fisheries and Oceans Canada that the project, as proposed, will adversely impact wetlands that support species at risk and migratory birds. They indicate that given the high level of wetland loss in the region, from a cumulative effects perspective the project has the potential to result in significant adverse effects to wetlands. Environment Canada advises that the avoidance of these impacts is the recommended approach. Environment Canada advises that if avoidance is not deemed appropriate, measures should be implemented to ensure that indirect impacts to the adjacent Silverdale Wetland properties are avoided. Environment Canada notes that provided avoidance of such impacts can be ensured, the loss of wetland habitat functions within the project footprint could be achieved through appropriate compensation requirements.

Based on this advice from Environment Canada, in their January 14, 2012, letter to Fisheries and Oceans Canada,



Carhoun & Sons Enterprises Ltd., the proponent, confirmed their commitment, willingness and preparedness to mitigate any direct loss of wetlands (and/or floodplain) and associated riparian areas on the project site as outlined in the following documents:

- “*Environmental Impact Assessment for the Proposed Commercial and Residential Development at Wren Street and Highway 7, Mission BC*” report (EIA) (Scott Resource Services Inc., September 2009)
- “*Conceptual Compensation Plan for the Wren Creek Development*” (Compensation Plan) (Scott Resource Services Inc., January 2011)
- “*Response to Joshua Malt email of June 17, 2011 review comments regarding environmental impacts associated with proposed development at Wren St. and Highway 7 in Mission, BC*” (Bianchini Biological Services, August 9, 2011).

The proponent further agreed to initiate a direct dialogue with the owners of the adjacent Silverdale Wetlands properties (Ducks Unlimited and the District of Mission) to establish a review process of the proposed project and Integrated Storm Water Management Plan (ISMP) to ensure avoidance and/or mitigation for any indirect adverse impacts to wetlands functions in the Silverdale Wetlands that may result from the project.

Fisheries and Oceans Canada is assured by the proponent’s commitments in their January 14, 2012 letter, and by the mitigation and compensation direction provided in EC’s Dec. 22, 2011 letter, that the loss of wetland habitat functions within the project footprint can be achieved through appropriate compensation, and that measures can be implemented to ensure that indirect impacts to the adjacent Silverdale Wetland properties are avoided. After taking into account the implementation of appropriate mitigation measures, Fisheries and Oceans Canada is of the opinion that the project is not likely to cause significant adverse environmental effects on wetlands. Fisheries and Oceans Canada will rely on advice from Environment Canada whether proposed mitigation is satisfactory prior to issuing any authorization under the *Fisheries Act* that would allow this project to proceed, in whole or in part,.

### **Terrestrial Habitat Values including SARA listed wildlife species**

Based on Environment Canada’s December 22, 2011 letter, Fisheries and Oceans Canada understands that the *Species at Risk Act*-listed species found on the property fall under provincial management jurisdiction. Environment Canada noted that, as per the *Canada-British Columbia Agreement on Species at Risk*, should the project proceed British Columbia will identify the measures that the Province will take to avoid or lessen any adverse effects on those species at risk found on the property. Environment Canada suggests that Best Management Practices be followed in order to avoid impacting habitat for the Oregon Forest Snail. After taking into account the implementation of appropriate mitigation measures, Fisheries and Oceans Canada is of the opinion that the project is not likely to cause significant adverse environmental effects on terrestrial habitat.

### **Summary of environmental risks**

#### Fish and fish habitat

A habitat compensation proposal includes purchasing properties where channels and ponds for producing fish including salmon and trout will be constructed. This compensation proposal is proposed to be sufficient to offset the direct loss of fish habitat that will result from the Project footprint.

The Proponent is committed to developing and implementing a stormwater management plan to mitigate potential impacts to fish habitat areas (wetland channels and ponds) neighbouring the Project site. While it is expected that some potential impacts can be mitigated by a stormwater plan, the overall effectiveness of a stormwater plan is uncertain. If indirect effects occur to fish habitat, those effects will be difficult to reverse.

#### Terrestrial Species at Risk

The Project site has habitat suitable for 10 federally and provincially listed wildlife species. Of particular importance as noted in the correspondence from Environment Canada and the BC Ministry of Forests, Lands and Natural Resource Operations and the Project’s Environmental Impact Assessment report, the Project site provides approximately 5.4 ha. of suitable habitat for Oregon forestsnail (OFS) and OFS individuals were observed at this Site.

The proposed habitat compensation strategy intended to offset losses of habitat for OFS at the Project site is largely the protection of existing habitat. Applying this compensation strategy may result in an overall net loss of habitat for OFS and is not sufficient for ensuring that significant adverse effects to OFS will not occur. In addition, the suggested mitigation to avoid harming OFS individuals is to salvage and relocate individuals; this mitigation measure is untested and it is suggested that relocated OFS individuals are unlikely to survive.

Generally, while effects to other listed species were not discussed in detail, this Project will directly impact (eliminate) habitat suitable for other species. While some of the habitat compensation proposed for these other species will include restoring damaged areas, it appears that in most cases for most of the species that some of the proposed habitat compensation is the protection of existing and suitable habitat. Therefore it is expected that overall net losses of habitat for other listed wildlife species may also occur as a result of the Project.

### Wetlands

Wetlands are important ecological features that provide habitat for fish, wildlife, migrating birds, species at risk, flood mitigation, and water quality treatment. The Project occurs in an area that has experienced critical wetland losses; approximately 85% of the original wetlands in this region have been eliminated and only 15% remain.

The Project will impact wetlands that are ecologically important to the region and will result in the direct elimination of between approximately 1.1 ha. and 2.1 ha. of wetland habitat depending on final Project design (footprint). In addition, the project may also potentially result in unquantified additional impacts to neighbouring wetlands including the Silverdale Creek wetlands and the wetland situated south of the Project site.

The Project will potentially result in significant adverse effects to wetlands which warrants application of avoidance, minimization, and mitigation of impacts to wetlands and application of adaptive management.

### **Overall conclusion**

A number of potentially significant adverse effects and risks exist with the proposed Project that to be avoided will require commitment from the proponent to address as described in the Proponents letter of commitment dated January 14, 2012. Prior to project initiation, DFO recommends that a comprehensive adaptive management plan be developed based on the mitigations measures proposed and committed to by the proponent and included in this screening report to avoid, minimize and mitigate adverse environmental effects.

### **30. "Need for", "Purpose of", "Alternatives to" and "Alternative Means of" the Project**

Responsible authorities are encouraged to include consideration of need for, purpose of, alternatives to, and alternative means in screenings of large or complex projects. (For example, alternatives to the project should be considered if there are adverse effects on a species at risk or its critical habitat as defined under the Species at Risk Act.)

#### Need for the project:

To supply residential and local commercial retail space to meet potential market demands.

#### Purpose of the project:

From a proponents perspective the purpose of the project is to develop the site in order to achieve a potential economic return to the development company.

The purpose of the project from a local government perspective is also considered here since rationale for proceeding with assessment of the project is in part due to support from the District of Mission for a review of the project to occur and because local government consideration or approval is required for this project.

From a local government perspective the purpose for the project, and rationale for supporting its consideration, relates

to its potential to provide local employment, local tax revenues, development cost charge revenue, and a number of objectives identified under the local government Official Community Plan.

Alternatives to the project:

From a proponent perspective alternatives to developing the site in order to meet the stated need and purpose are largely limited to the subject property unless the subject properties were sold or other development properties were pursued. While such options, including donating land under land conservation programs or tax credit programs may be available to provide economic benefit they are not explored in this analysis. "Alternative means" of carrying out the project are covered in the "alternative means" section below.

From a local government perspective there are a number of development or redevelopment scenarios and land is available to meet the needs and purpose of the project. Examples of four such scenarios are described in the District of Mission Employment Lands Strategy including a preferred scenario that describes the long-term needs of the community and the availability of both land and development options for that land.

The subject site is located adjacent to Highway 7 a major local roadway and adjacent residential areas which provides location specific benefits. The site is relatively large approximately 30 acres and under the current project up to a proposed 27 acres of commercial and 3 Acres of residential development if ravine and wetland areas are in-filled.

From a local government perspective the District of Mission estimates property tax benefits of approximately \$1.86M annually for the project as proposed, and one time development cost charges of approximately \$1.93M. While modifying the development to avoid infilling riparian areas, ravine sand wetlands would reduce potential developable area by approximately 50 to 60% there would still be significant land remaining and an opportunity for significant residential and commercial space and opportunity to realize substantial tax, employment, development cost charge revenue and benefits.

While opportunities for development, employment and tax base may be reduced by approximately 50% to 60% with a development footprint which avoids ravines and wetlands on the subject property, there is other land available within the District. The District of Mission's Employment Lands Strategy specifically identifies the location of the subject properties and indicates that future development land needs can be achieved assuming only half of the available land will be developed. The Strategy also indicates that sufficient designated and undesignated lands within the District can supply sufficient commercial and retail space until circa 2057.

In its January 20, 2010 report, the District of Mission Economic Development Office addressed the economic rationale for the proposed Project. According to this report the proposed Project would utilize 27 of 174 acres (the report) provided by the District of Mission Economic Development officer indicates the subject development represents 27 of 174, or 15% of land identified by BC Assessment for highway commercial use. This report suggests that increasing employment opportunities, minimizing "spending leakage" and increasing the tax base be taken into consideration in justifying the destruction of the environmentally sensitive lands within the Silverdale Creek watershed area to enable the Project to proceed.

On the other hand, the District of Mission Employment Lands Strategy shows that there is actually a total of 478 acres of land in the area that has not been designated for highway commercial use, and that the proposed Project would utilize only 27 acres. This represents only 5.6% of all land falling within the highway commercial category, which is substantially less than 15% as noted in the economic rationale contained in the January 20, 2010 report by the District of Mission Economic Development Office.

Both the Employment Land Strategy and the economic rationale contained in the District of Mission Economic Development Office report indicate that sufficient land exists within Mission's core area to meet employment needs for the next 47 consecutive years. The Employment Lands Strategy reaches this conclusion taking into account a number of factors including existing land use constraints such as unfavourable topography and environmental protection of creeks and wetlands as required by the District of Mission Streamside protection Bylaw. Consequently the proposed Project site is identified in Table 7 and on Map 3 in the Employment Land Strategy as falling within a subcategory comprised of a total of 55 acres, only 32 acres of which have been identified as "available developable". The Strategy itself is also conservative in that it assumes only half of the remaining available land will be developed.

Limiting the proposed Project to the eastern portion of the site would still provide approximately 102,000 square feet of commercial development building space and approximately 1/3 of the estimated economic, tax, and employment benefits identified in the District of Mission Economic Development report.

The Employment Land Strategy also identifies improved development configurations which could potentially increase commercial and economic benefits. Employment strategy 3a states:

*“focus highway commercial uses to the area east of the Silvercreek Estuary lands with the properties at the four corners of Wren and the commercial property on the northeast corner of Nelson Street having an overlapping designations to increase flexibility of uses on those properties where there is potential for increased square footage of improvements and higher employee numbers per square foot.”*

And

“2. To better use commercial land located near the core area, amend the Zoning Bylaw to:

- ensure new mall developments will consider the topography and provide two storeys or more with level parking access to each commercial storey and/or under building parking to reduce large surface parking areas and increase Floor Space Ratios; and
- provide greater flexibility for a mix of business industrial and commercial uses on highway commercial properties around Oliver Street and on the northeast corner of Nelson Street and the Lougheed Highway.”

And

**“Target**

Achieve the minimum FSR development requirements or greater under scenario 3 in order to amend the OCP:

- Highway Commercial on [16 acres] ½ of the available land at 0.3 FSR, and
- Core Commercial on the waterfront and downtown on ½ of available land at 2.0 FSR”

Of the 16 acre target for the highway commercial category 10 acres are currently under construction immediately across the Lougheed Highway from the Project at the Smart Centre Mall and Wal-Mart site. Developing just the disturbed portions of the project site would provide approximately 10 acres of additional highway commercial development or a total of 20 acres thus exceeding the 16 acre highway commercial target by 4 acres.

Based on the above information, elimination of ravines, riparian areas and wetlands is not required to meet the District of Mission’s long term employment and economic objectives and targets.

Alternative means of carrying-out the project:

Alternate means of carrying-out the project are focussed on alternatives that would minimize the direct adverse environmental effects on the property and potential adverse effects downstream of the property. This alternative means consideration primarily involves avoiding environmentally sensitive areas on the site consistent with applicable guidelines, best management practices and legislation such as the District of Mission riparian protection bylaw.

The Bianchini Biological Services report and Scott Resources Environmental Services report recommend that option 1 that limits development to the eastern portion of the site be pursued as this would avoid adverse effects including those to endangered species/species at risk unless option 1 is not feasible. The proponent has proposed option 2 be pursued as the only economically feasible option.

Rationale or economic analysis has not been provided as to why option 1 or alternative development footprints are not economically feasible. That being said it is apparent that option 1 suggests that development not occur at all on the western portion of the property including upland areas which could make an economic return difficult if this portion was completely undeveloped. The rationale for this recommendation appears to be primarily related to avoiding impacts to Oregon forestsnail and to meet buffer zones for other endangered species or species at risk. Notwithstanding the consultant’s recommendation there is significant upland area outside of the riparian areas and wetlands that would allow some of the proposed residential or other development.

An alternative including option 1 plus some development in the upland could be consistent with the District of Mission Riparian protection bylaw and with significantly less adverse effects to Oregon forestsnail and limited intrusion into recommended buffer zones for other endangered species. The reduced adverse environmental effects associated with such a revised option 1 are more consistent with recommended best practices and avoidance measures for

endangered species and amenable to potential mitigation and compensation options.

With respect to the economic viability of alternatives such as a revised option 1, economic return can be considered relative to the purchase price or value and development potential of the property at the time of property purchase and development costs versus development return. Guidelines and legislation associated with environmentally sensitive areas such as riparian areas, ravines and wetlands, including local government bylaws have been in place since 1992 or longer. In addition, during rezoning of lands associated with the project, the District of Mission was advised in a letter dated February 4, 2002 that riparian and associated habitat should be protected in accordance with applicable legislation and guidelines. Locating development on the upland portions of the western portions of the site and outside of riparian or ravine areas should be considered with respect to expectations for potential economic benefit for the subject property.

With respect to other environmental effects Option 1 would virtually eliminate all other environmental effects associated with the project. Since much of the eastern portion of the site identified in option 1 is significantly disturbed the only apparent potential environmental effect relates to the potential for water quality and quantity effects related to Stormwater management. Given the smaller footprint of the eastern portion of the site and its disturbed state reaching Stormwater objectives would be less challenging than the current proposal and the potential for downstream impacts to wetlands or fish habitat greatly diminished.

In addition to alternate project footprints alternative development form or spaces including multi-level commercial buildings or parking arrangements could provide additional commercial space to meet the need for and purpose of the project. This approach would be consistent with recommendation and preferred options identified in the District's Employment Lands Strategy which state:

*"focus highway commercial uses to the area east of the Silvercreek Estuary lands with the properties at the four corners of Wren and the commercial property on the northeast corner of Nelson Street having an overlapping designations to increase flexibility of uses on those properties where there is potential for increased square footage of improvements and higher employee numbers per square foot."*

And :

*"Achieve the minimum FSR development requirements or greater under scenario 3 in order to amend the OCP:*

*Highway Commercial on ½ of the available land at 0.3 FSR, ...."*

From a District of Mission perspective the January 20, 2010 economic rationale provided by the District of Mission Economic Development officer identified a number of potential benefits to the District related to project purpose. These include:

1. Redirection of undetained municipal stormwater to address flows that are currently identified as causing erosion and siltation
2. A 5000m<sup>2</sup> stormwater detention pond on the eastern edge of the Silverdale wetland, and;
3. Purchase of land to complete acquisition of the Silverdale Creek and Greenway corridor.

With respect to item 1 above undetained municipal stormwater from offsite is being release into Wren Creek and the central ravine (watercourse 1) onto the site and it is apparent that stormwater is causing erosion in particular in the upper part of the Central ravine (watercourse 1) on the property. However it appears that the erosion is limited to the upper ravine area. The wetlands themselves appear intact and functional and that the stormwater flows are being accepted and attenuated by the floodplain wetlands within the ravines. Based on the lack of erosion and sedimentation at the downstream side of the wetlands it appears that the wetlands are providing natural treatment of the stormwater and maintaining water flow to downstream fish habitat and wetlands south of Highway 7.

Development options include the potential to direct stormwater flows to a stormwater pond that would be located on the eastern portion of the Silverdale wetland. This approach would result in adverse environmental effects to existing wetland habitat. Another alternative is to redirect watercourse stormwater flow to a ravine to the north of the site, however this option requires an expenditure of funds to construct a new stormwater outfall and the potential exist for similar erosion to occur at the new location.

An alternate means of carrying out this component would involve extending the current stormwater outfall to the base of the upper ravine area and or providing some erosion protection. While this may result in some cost to the District it

will avoid proponent costs and potential offsite environmental effects and maintain water flows to habitat established downstream wetland and aquatic habitat.

With respect to item 2 above construction of a 5000 m<sup>2</sup> stormwater detention pond on the eastern edge of the Silverdale wetland is identified as required as a component of the project and does not appear relevant to municipal needs and in particular if the alternative identified in item 1 above is pursued. The pond would also result in impacts to the current wetland habitat and have potential flow related adverse effects.

With respect to item 3 above the purchase of proposed habitat compensation site land by the proponent would be a benefit to the District in terms of acquisition of District identified Park land and District objectives for environmentally sensitive land management. However it is noted that much of the land is currently protected by various provincial, federal and municipal legislation and is currently identified as Park in the municipal OCP. Significant portions of the compensation site have also been identified as already providing habitat for wildlife species as well as riparian or aquatic species that are also afforded protection under various municipal, provincial and federal legislations.

The District and others have expended significant funds to acquire significant areas of the Greenway and that the 2 proposed compensation site properties are the last remaining properties to be acquired to complete the Greenway plan. Given this it is highly likely that the property will eventually be acquired by the District or through similar land development options in the future and given that there is still significant development planned and occurring within the Silverdale watershed significant opportunities for alternative acquisition exist for purchase of the property. For example the District's Cedar Valley Development Plan identifies a need to locate up to 12 hectares of habitat compensation and a recent highway widening project still has funds set aside to secure outstanding habitat compensation from impacts within the Silverdale watershed.

#### Summary

In consideration of the needs for, and purposes of the project, from both a proponent and local government perspective including present and future employment, increased tax base and other economic targets there appears to be viable alternatives to, and alternative means of carrying out the project. These alternatives have the potential to be both economically viable and very significantly reduce direct onsite, and potential offsite, adverse environmental effects. These alternatives should be explored further during project design and subsequent *Fisheries Act*, District or Provincial permitting processes.

#### **31. Public Participation in Screening under Subsection 18(3) of CEAA:**

**Was it considered appropriate in the circumstances?** Yes  No

**Explain why public participation was or was not considered appropriate.**

In accordance with the *Canadian Environmental Assessment Act*, the Notice of Commencement notified the public that the review of the project commenced, outlined the federal scope of the project and established the public registry for the project at [www.ceaa.gc.ca](http://www.ceaa.gc.ca). Through this process, the public may request documents from the public registry and comments from the public pertaining to environmental effects may be considered as part of the environmental assessment.

As a result of these actions by the Proponent, DFO and public notification through the Canadian Environmental Assessment Registry, public participation in this Screening under Subsection 18(3) was not invoked.

#### **32. Summary of Public Comments and Concerns Related to Screening under Subsection 18(3):**

Subsection 18(3) of CEAA was not invoked.

#### **33. Follow-up Program:**

**Was it considered appropriate in the circumstances?** Yes  No

## SCREENING CONCLUSION

### 35. Conclusion on Significance of Adverse Environmental Effects:

**After considering the proposed Project mitigation, including avoidance, minimization, and mitigation measures; proponent commitments; follow-up monitoring; and adaptive management, the Project is not likely to cause significant adverse environmental effects.**

### 36. Confirmation by Proponent

I, \_\_\_\_\_, having the authority to commit funds and activities on behalf of \_\_\_\_\_ have read and understood the above material outlining conditions for the above project. I confirm that \_\_\_\_\_ will undertake all of the mitigation conditions outlined in this environmental screening report and any additional measures necessary to ensure protection of the environment and compliance with environmental regulations during the operation, maintenance and decommissioning of this project.

**Signed by:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**Title:** \_\_\_\_\_

**37. CEAA Decision Approved by:** \_\_\_\_\_ **38. Date:** \_\_\_\_\_

**39. Name:**

**40. Title:**

## COURSE OF ACTION DECISION

### 41. Course of Action Decision: (under Section 20 of CEAA)

DFO may exercise its power, duty or function, i.e. may issue the authorization - where the project is not likely to cause significant adverse environmental effects. Confirm below the specific power, duty or function that may be exercised.

- DFO may issue a *Fisheries Act* Authorization or Approval
- DFO to recommend to Governor in Council to exercise power, duty or function
- DFO to proceed with project (as proponent)
- DFO to provide financial assistance for project to proceed
- DFO to provide federal land for project to proceed

DFO may not exercise its power, duty or function - the project is likely to cause significant adverse environmental effects that cannot be justified in the circumstances.

DFO shall refer the project to the Minister of the Environment for referral to a mediator or review panel if it is uncertain whether the project is likely to cause significant adverse environmental effects.

DFO shall refer the project to the Minister of the Environment for referral to a mediator or panel - the project is likely to cause significant adverse environmental effects that may be justified in the circumstances.

DFO shall refer the project to the Minister of the Environment for referral to a mediator or review panel - public concerns warrant a reference to a mediator or review panel.

### 42. References:

Canada-British Columbia Agreement on Species At Risk, signed 2005.

Canadian Environmental Assessment Agency. 1999. Cumulative Effects Assessment Practitioners Guide.

Canadian Wildlife Service. 1996. The Federal Policy on Wetland Conservation Implementation Guide for Federal Land Managers.

District of Mission. 2010. Employment Lands Strategy.

Federal Environmental Assessment Review Office. 1994. Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects.

Fisheries and Oceans Canada (DFO). 1999. Fraser River Action Plan, Lower Fraser Valley Streams Strategic Review.

Quigley, Jason and Harper, David. 2005. Effectiveness of Fish Habitat Compensation in Canada in Achieving No Net Loss. *Environmental Management* 37: 351-366.

Rosenau et al. 2005. Conflicts Between Agriculture and Salmon in the Eastern Fraser Valley.



## SCREENING CONCLUSION

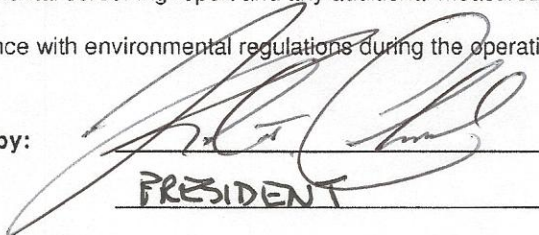
### 35. Conclusion on Significance of Adverse Environmental Effects:

After considering the proposed Project mitigation, including avoidance, minimization, and mitigation measures; proponent commitments; follow-up monitoring; and adaptive management, the Project is not likely to cause significant adverse environmental effects.

### 36. Confirmation by Proponent


I, KAREL CARHOUN, having the authority to commit funds and activities on behalf of CARHOUN & SONS ENTERPRISES LTD. have read and understood the above material outlining conditions for the above project. I confirm that CARHOUN & SONS ENTERPRISES LTD. will undertake all of the mitigation conditions outlined in this environmental screening report and any additional measures necessary to ensure protection of the environment and compliance with environmental regulations during the operation, maintenance and decommissioning of this project.

Signed by:

  
Title: PRESIDENT

Date: FEB 15 2012

37. CEAA Decision Approved by:



38.

Date: Feb 14 2012

39. Name: Brad Farnes

40. Title: Regional Manager Habitat Management Program