



28 October 2014

Gloria White
Environment Canada – Canadian Wildlife Service
5241 Robertson Road
RR #1
Delta, BC V4K 3N2

Project No.: 219.05112.00010
Client Reference No.: DFRP # 16096, ARMS # 00394, FCSI # 16096079

Dear Ms. White,

**RE: REQUEST FOR PERMIT
PROPOSED REMEDIATION ACTIVITIES
WILMER MARSH UNIT, COLUMBIA NATIONAL WILDLIFE AREA
NEAR WILMER, BC**

SLR Consulting (Canada) Ltd. (SLR) is submitting this request for a permit to conduct remediation activities in the marsh and in the vicinity of the trail connecting the uplands and marsh at the Wilmer Marsh Unit of the Columbia National Wildlife Area (NWA), near Wilmer, BC (the Site).

1.0 PROPOSED WORKS

Based on work completed in 2013-2014, Environment Canada (EC) is planning to undertake remediation activities at the Site to remove residual debris present in the marsh and to remove debris and associated contaminated soil located in the trail area between the uplands and the marsh (please refer to SLR draft report *2013/2014 Site Works Summary and Remedial Action Plan Report, Former Refuse Site – Wilmer Marsh Unit, Columbia National Wildlife Area, Near Wilmer, British Columbia*, dated March 31, 2014).

This permit request is for the completion of the remediation activities at the Site, specifically:

- Completion of an on-site bidder's meeting at the Site in late November or early December 2014 to allow potential contractors to review the Site, its current conditions and the logistical and wildlife constraints associated with conducting remedial works in the NWA.
- Removal of several large pieces of debris from the marsh utilizing specialized equipment and transporting the debris (potentially via helicopter and/or crane) to a temporary staging area adjacent to Westside Road for transport and off-site disposal.
- Removal of surficial debris (manually and by machine) from the trail area and adjacent slopes and gully to the south of the trail and transport to the temporary staging area along Westside Road for transport and off-site disposal.
- Excavation of debris and associated soil from two zones (referred to as the main debris zone and Area of Impact 3) in the proposed trail work area.

- Soil in Area of Impact 3 would likely be re-used as backfill and the surrounding area re-contoured to account for the removal of the debris volume. Debris from Area of Impact 3 would be transported to the temporary staging area adjacent to Westside Road for transport and off-site disposal.
- Soil and debris in the main debris zone would be excavated to a depth of approximately 1.5 m (but potentially deeper in select areas). The soil in the main debris zone would be excavated with the debris. Soil and debris would be transported to the temporary staging area adjacent to Westside Road and then transported off-site for additional screening (i.e. separation of soil from debris) and subsequent disposal. The excavation in the main debris zone would be backfilled with non-contaminated imported material to return the area to the existing grade. SLR is proposing to source the backfill material from a location north of the refuse site along Westside Road, within the NWA.
- Collection of confirmatory soil and surface water samples during the remediation program (estimated to be approximately 80 confirmatory soil samples and 2 confirmatory water samples).

2.0 GENERAL WORK PLAN CONSIDERATIONS

All project works will be carried out in such a manner so as to avoid any adverse impacts on fish or wildlife, or any harmful alteration of fish or wildlife habitat. Specific considerations are detailed below.

A sediment curtain will be installed around the proposed marsh work area in early November 2014 as a measure to avoid causing harm to fish and fish habitat during the remediation activities. Fish salvage will be conducted immediately following curtain installation (permit obtained from Ministry of Forests, Lands and Natural Resource Operations). The curtain will remain in place until surface water testing indicates that turbidity parameters (total suspended solids and total dissolved solids) are consistent with pre-remediation baseline conditions.

A number of measures will be incorporated into the tender specifications for the remediation project to address geotechnical concerns and mitigate potential effects on site soils including:

- Reducing excavation depths.
- Conducting remediation works during extended periods of dry, or frozen, ground conditions.
- Utilizing low-impact equipment with operators experienced in working on steep slopes.
- Exercising caution around the void on the lower portion of the trail.
- Constructing cross-ditches along the trail following remediation to divert surface flow from the disturbed soil surfaces.
- Constructing cross-slope terraces along long sections of steep uniform slopes to break the slope and slow surface runoff along the slope (to be conducted as part of the remediation activities, following debris excavation).
- Providing a geotechnical monitor during the remedial excavation activities.
- Implementing erosion and sediment control measures including deposition of coarse woody debris and installation of coconut fibre mat cover.

Additional measures that will be implemented during the remediation program to mitigate potential effects on wildlife include the following:

- Identification of “no work” zones around identified wildlife trees and native vegetation areas.
- Establishment of “environmental response measures” developed in consultation with CWS in the unlikely event that turtles are disturbed during the marsh debris removal program.
- Completion of inspections of the proposed work areas by an environmental monitor to verify that species at risk and sensitive species are not present in the work areas immediately prior to remediation activities. Should any such species be encountered, CWS will be contacted and the work plan revised to avoid impacts to the species noted.

As part of the bid package, contractors will be requested to provide documentation of their experience working on steep slopes, in sensitive habitats and around sensitive species. As well, as part of the contractor’s pre-work submittals, they will have to prepare an Environmental Protection Plan covering erosion and sediment control planning, water management planning, equipment route planning, spill control and contaminant prevention planning and waste management planning.

Please note that based on correspondence with Environment Canada (letter dated November 25, 2010), a Species at Risk permit was not required for previous remediation works completed in the marsh. Based on the results of the October 2014 pre-remediation field activities (included as an attachment to SLR’s letter “Request for Permit – Scientific Application Information, Proposed Remediation Activities, Wilmer Marsh Unit, Columbia National Wildlife Area, Near Wilmer, BC”), there is no evidence of current activity of extirpated, endangered or threatened species in the proposed work area. Badger burrows were observed in the vicinity of the proposed trail work area but were noted to be abandoned with no evidence of recent use. As well, at least two individual turtles (species not confirmed) were observed in the vicinity of the proposed marsh work area; it is noted that the Intermountain-Rocky Mountain population of Western Painted Turtle is considered a species of Special Concern under the Species at Risk Act.

3.0 TIMING

SLR is proposing to conduct the on-site bidder’s meeting in late November or early December 2014 with the remediation activities conducted between January 5, 2015 and March 31, 2015.

If you have any questions or concerns, please do not hesitate to contact the undersigned.

Yours sincerely,
SLR Consulting (Canada) Ltd.



Lindsay Paterson, MSc, PAg
Soil Scientist

LP/lp

Attachments: SLR letter “Request for Permit – Scientific Application Information, Proposed Remediation Activities, Wilmer Marsh Unit, Columbia National Wildlife Area, Near Wilmer, BC”

2014 Oct 28 Wilmer Permit Request Remediation Program.docx



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Gloria White
Environment Canada – Canadian Wildlife Service
5241 Robertson Road
RR#1
Delta, BC V4K 3N2

Project No.: 219.05112.00010
Client Reference No.: DFRP # 16096, ARMS # 00394, FCSI # 16096079

Dear Ms. White,

**RE: REQUEST FOR PERMIT – SCIENTIFIC APPLICATION INFORMATION
PROPOSED REMEDIATION ACTIVITIES
WILMER MARSH UNIT, COLUMBIA NATIONAL WILDLIFE AREA
NEAR WILMER, BC**

SLR Consulting (Canada) Ltd. (SLR) is submitting scientific permit application information for a permit to conduct remediation activities in the marsh and in the vicinity of the trail connecting the uplands and marsh at the Wilmer Marsh Unit of the Columbia National Wildlife Area (NWA), near Wilmer, BC (the Site).

While it is understood that an application for a permit to kill and/or capture migratory birds is not required as a part of this project, information required in a portion of that application is required for a permit to conduct the proposed works. SLR has provided the information below for each applicable section of the scientific application.

REQUEST FOR MULTI-YEAR PERMIT?

No.

PROJECT START AND END DATES

The proposed remediation activities are proposed to occur from **January 5, 2015 to March 31, 2015**. It is likely that the project will be completed earlier than this date, and SLR will advise CWS upon completion.

As well, it is anticipated that an on-site bidder's meeting will be required to allow potential contractors to review the Site, its current condition and the logistical and wildlife constraints associated with conducting remedial works in the NWA. The on-site bidder's meeting (anticipated to be one day in duration only) will likely occur in **late November or early December, 2014**.

To that end, SLR is requesting the permit over the period of **November 15, 2014 to March 31, 2015**.

PROJECT TITLE (maximum 50 letters)

Remediation of former refuse site at NWA.

PROJECT DESCRIPTION (condensed version of proposal, two paragraphs)

The Site is located in the Wilmer Marsh Unit of the Columbia National Wildlife Area near Wilmer, BC. The proposed work area includes a portion of the marsh where residual debris has been observed as well as the area of the trail connecting the uplands bench to the adjacent marsh. The activities associated with this project involve the removal of residual debris present in the marsh and removal of debris and associated contaminated soil located in the trail area.

The project activities will include removal of several large pieces of debris from the marsh utilizing specialized equipment and transporting the debris (potentially via helicopter and/or crane) to a temporary staging area adjacent to Westside Road for transport and off-site disposal. The remediation activities in the trail area will involve removal of surficial debris (manually and by machine) from the trail area and adjacent slopes and gully to the south of the trail. The remediation activities in the trail area will also involve the excavation of debris and associated soil from two zones (referred to as the main debris zone and Area of Impact 3). Soil in Area of Impact 3 would likely be re-used as backfill and the surrounding area re-contoured to account for the removal of the debris volume; debris from Area of Impact 3 would be transported to the temporary staging area adjacent to Westside Road for transport and off-site disposal. The soil in the main debris zone would be excavated with the debris, transported to the temporary staging area adjacent to Westside Road and then transported off-site for additional screening (i.e. separation of soil from debris) and subsequent disposal. For further information, please refer to the draft SLR report titled 2013/2014 Site Works Summary and Remedial Action Plan Report (Section 5.4). The proposed work areas are also depicted on Drawing 1.

PROJECT LOCATION(S)

The Site is located within the Wilmer Marsh Unit of the Columbia National Wildlife Area, approximately 1.2 kilometres north of Wilmer, BC. The latitude and longitude for the gate at the entrance to the Site off of Westside Road is 50°33'00.78"N, 116°04'16.82"W.

PROJECT COMPONENT(S)

Marsh Debris Removal:

Based on SLR's previous experience at the Site, equipment access to the marsh debris areas can only occur when there is sufficient ice upon the marsh to support the weight of the equipment. Specialized equipment (e.g. spider-type hoes) would be mobilized to the marsh via the existing trail and then to the proposed marsh work area over the ice.

Holes would be cut into the ice at previously identified debris locations (refer to Figure 2 of the draft SLR report titled 2013/2014 Site Works Summary and Remedial Action Plan Report), sufficient in size to remove the debris safely without compromising the integrity of the ice to support the equipment. Should debris exceed the safe hole size, the debris would be broken down into smaller pieces for removal. Debris would be contained in impermeable sacks or steel buckets and transported (potentially by helicopter and/or crane) to the staging area along Westside Road for off-site transport and disposal. Please note that the program does not include the excavation or dredging of sediment from the marsh area. Only sediment

incidentally adhered to the debris would be removed from the Site. Consequently, the area of disturbance will be localized to the immediate vicinity of the debris and will not involve widespread disturbance of sediments in the work area. It is anticipated that approximately 50 cubic metres of debris may be removed from the marsh during the debris removal program.

Trail Debris Removal:

Work will be conducted following the marsh activities as access to the marsh is required along the trail. The remediation of the trail area is comprised of three parts:

- 1) excavation of the debris at Area of Impact 3 (approximately 1000 m³ of soil/debris);
- 2) removal of surficial debris across the trail and adjacent slopes and gully (approximately 200 m³ of debris), and;
- 3) excavation of the debris in the main debris zone to a depth of approximately 1.5 m but potentially deeper in select areas (approximately 1350 m³ of soil/debris but potentially more).

As the excavation of debris at Impact Area 3 and the removal of surficial debris across the trail area are reliant upon access via the existing trail, the remediation of these areas must be completed prior to the excavation of the main debris zone. In the event that improvements to the existing trail cannot be made to allow the transport of debris from Area of Impact 3 and other parts of the trail, additional measures (i.e. crane) may be required.

Following debris removal, Area of Impact 3 would be recontoured to accommodate the loss of volume corresponding to the removed debris. In the main debris zone, the excavation would be backfilled with non-contaminated imported material to return the area to the existing grade. SLR is proposing to source the backfill material from a location north of the refuse site along Westside Road, within the NWA (refer to Drawing 1).

Soil and debris would be transported to the temporary staging area along Westside Road and then transported for off-site separation, characterization and disposal.

DESCRIPTION OF BIOPHYSICAL EFFECT

Overall, the timing of the remediation project (January-February 2015) is intended to limit disturbance to wildlife using the Site as well as minimizing disturbance to site soils. The use of specialized equipment (such as spider-type hoes and helicopters/cranes) is also intended to minimize disturbance to site soils.

Limited biophysical effects are anticipated in the proposed marsh work area. There may be some short-term disturbance of sediments and benthic organisms during the removal of the debris, resulting in localized turbidity in the water column in the work area. A sediment curtain will be installed around the work area in early November 2014 to mitigate potential impacts outside of the immediate work area (work completed under CWS permit BC-14-0041). The sediment curtain will remain in place until surface water testing indicates that turbidity parameters (total suspended solids and total dissolved solids) are consistent with pre-remediation baseline conditions.

Biophysical effects in the proposed trail work area are primarily related to the removal of soils/debris and local disturbance of vegetation. With the exception of two native vegetation areas which have been identified by SLR and which will be treated as “no work” zones during the remediation project (see further discussion below), the vegetation in the proposed trail work area is comprised of invasive and non-native species (i.e. crested wheatgrass). There are a number of geotechnical concerns related to work at the Site and the proposed project will incorporate a number of mitigation measures (see further discussion below).

CUMULATIVE EFFECTS

The primary cumulative effect at the Site is related to disturbance and potential compaction of site soils from human and equipment traffic. However, the timing of the project as well as the type of equipment to be utilized is intended to minimize adverse effects.

DESCRIPTION OF MITIGATION MEASURES

SLR retained Clarke Geoscience Ltd. (CGL) to evaluate the geotechnical implications of remedial excavation activities in the trail area and to recommend mitigation measures. CGL noted that there were no slope stability concerns associated with remedial activities at Area of Impact 3 based on the shallow depth of the debris in the area and the low slopes. CGL identified a number of potential slope stability and soil erosion concerns associated with the proposed excavation of the main debris zone in the trail area and recommended the following mitigation measures to complete the remedial excavation activities in a safe and effective manner (refer to draft SLR report titled 2013/2014 Site Works Summary and Remedial Action Plan Report):

- **Reduce excavation areas and depths to minimize the total area of disturbance and to reduce the height of potentially unstable cut slopes.** Excavation depths will be limited under the proposed work program.
- **Protect access routes on the Site by installing a 300 mm thick layer of well-graded, crushed angular gravel on a layer of filter fabric.** It is SLR’s understanding based on previous discussions with personnel from CWS that construction of “roads” on-site is generally not encouraged and may involve a lengthy approval process. Consequently, the work program will be conducted under extended periods of dry, or frozen, ground conditions.
- **Utilize low-impact equipment such as rubber-tired or spider hoe-type excavators (with operators experience in working on steep slopes) to reduce the potential for ground disturbance.** SLR will incorporate these recommendations into the tender specifications for the project.
- **Exercise caution in operating equipment in the vicinity of the void identified on the lower trail.** SLR will identify the location of the void in the trail during the on-site bidder’s meeting and in the tender specification documents.
- **Construct cross-ditches at the top of the trail to divert surface flow from the work areas.** SLR will incorporate this recommendation into the tender specifications.
- **Construct cross-slope terraces along long sections of steep uniform slopes to break the slope and slow surface runoff along the slope.** SLR will incorporate this recommendation into the tender specifications.
- **Provide at least a part-time geotechnical monitor for the duration of the excavation activities.** A geotechnical monitor will be retained during the remediation project.

- **Implement erosion and sediment control measures including deposition of coarse woody debris and installation of coconut fibre mat cover.** SLR will incorporate these recommendations into the tender specifications. Coarse woody debris would be sourced from other areas of the Site or adjacent lands to minimize the potential for introduction of invasive species.

Due to the potential for suspension of sediment (including disturbance of spatially-localized contaminated sediments) during the marsh debris removal program, SLR will be overseeing the installation of a sediment curtain in the marsh in early November 2014. Based on discussions with Fisheries and Oceans Canada as well as the observation of fish in the proposed marsh work area in October 2014, fish salvage will be conducted immediately following installation of the sediment curtain. A fish collection permit has been obtained from the BC Ministry of Forests, Lands and Natural Resource Operations.

In addition to the mitigation measures considered above, SLR also conducted pre-remediation environmental monitoring activities in October 2014 to evaluate whether mitigation measures are also necessary with respect to wildlife at the Site. SLR's report detailing the pre-remediation activities has been attached for reference. The work was completed in response to previous correspondence with Environment Canada (letter dated November 25, 2010) which recommended the completion of the following activities prior to completion of remediation work at the Site:

- Western Toad and Painted Turtle surveys (listed as species of Special Concern under the Species at Risk Act).
- Surveys for active American Badger dens at the Site (listed as Endangered under the Species at Risk Act).
- Surveys to identify potential wildlife trees in the vicinity of the remediation works which may be impacted by the site activities and to identify "no-work" buffer zones around the affected wildlife trees.
- Avoidance of work during the migratory bird breeding season to minimize damage to nests.

The October 2014 pre-remediation environmental monitoring activities noted the following with respect to Species at Risk at the Site:

- Turtles (species not determine) were observed in the vicinity of the proposed marsh work area. SLR will continue to monitor the proposed marsh debris removal area for the presence of turtles during the sediment curtain installation and fish salvage activities which are scheduled for early November. The activities will involve work from aluminum boats which may allow closer observation of any potential turtles. However, in the event that no further information is obtained on the turtles in the proposed marsh work area, SLR will incorporate "environmental response measures" developed in consultation with CWS into the tender specification documents in the unlikely event that turtles are disturbed during the marsh debris removal program.
- Although the Western Toad survey results are inconclusive due to timing constraints, it is considered unlikely that toads will be present in the water or sediment in the area of the marsh debris removal during the winter months (i.e. January-February 2015). Toads, if present, will be upslope of the marsh within the adjacent forested portions of the Site.
- Two abandoned badger burrows were identified near the proposed work area in the trail. However, there was no evidence of recent digging, soil piles or scat and there was

obvious vegetation and lichen growth over the burrows. Based on SLR's field observations, it does not appear that either burrow is being actively used.

- Four wildlife trees were identified along the gully to the south of the proposed trail work area. The UTM coordinates of the trees were recorded to allow for identification of "no work" zones during the proposed remediation activities. The "no work" zones will be incorporated into the tender specification documents for the remediation project.
- Two areas of native vegetation were identified and UTM coordinates recorded to allow for identification of "no work" zones during the proposed remediation activities. One area was located south of the trail and the other was located north of the trail on the uplands bench. The "no work" zones will be incorporated into the tender specifications for the project.
- SLR reviewed the proposed remediation work areas for other SARA-listed species (refer to Table B in SLR draft report 2013/2014 Site Works Summary and Remedial Action Plan Report). None of the SARA-listed species were observed in the proposed remediation work areas during SLR's inspections. It is noted that Hooker's Townsendia (*Townsendia Hookerii*) has previously been observed at the Site within the uplands bench native vegetation area which will be demarcated as a "no work" zone during remediation activities; Hooker's Townsendia is a provincially red-listed species but is not a SARA-listed species.

In addition to the above, an environmental monitor will be present at the Site for the entire duration of the remediation project. The environmental monitor would conduct an inspection for species at risk/sensitive species immediately prior to the start of the remediation activities and should any be encountered, CWS will be contacted and the work plan revised to avoid impacts to the species noted.

RESIDUAL EFFECTS ADVERSE

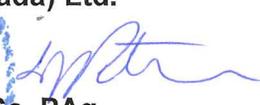
None. The project is intended to provide a net benefit to the Site through the removal of debris and remediation of associated soil contamination.

EFFECTS LIKELY SIGNIFICANT

The overall objective for the project work is intended to result in a significant net benefit to the Site in the long-term as the work involves removal of sources of contamination at the Site.

A copy of the permit request, dated October 28, 2014, has been submitted separately to CWS. If you have any questions or concerns, please do not hesitate to contact the undersigned.

Yours sincerely,
SLR Consulting (Canada) Ltd.


Lindsay Paterson, MSc, PAg
Soil Scientist

Enc Drawing 1: Proposed Work Areas
SLR Report "Environmental Monitoring Notes – Pre-Remediation Field Activities, Wilmer Marsh Unit, Columbia National Wildlife Area, October 6-9, 2014"

LP/lp

2014 Oct 28 Wilmer Permit Request Remediation Program Sci App Info.docx



NOTES
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PUBLIC WORKS AND GOVERNMENT SERVICES
 WILMER MARSH UNIT COLUMBIA NWA
 WILMER, BC

Report
 PERMIT APPLICATION

Drawing
 PROPOSED WORK AREAS

Date	October 27, 2014	Scale	NTS	Drawing No.	1
File Name	S_219-05112-00010-B1	Project No.	219.05112.00010		

THIS DRAWING IS FOR CONCEPTUAL PURPOSES ONLY. ACTUAL LOCATIONS MAY VARY AND NOT ALL STRUCTURES ARE SHOWN.



28 October 2014



Bradley Klaver
Environmental Specialist
Public Works and Government Services Canada
Environmental Services, Pacific Region
219 – 800 Burrard Street
Vancouver, BC V6Z 0B9

By Email: Bradley.Klaver@pwgsc-tpsgc.gc.ca

Dear Mr. Klaver,

**RE: ENVIRONMENTAL MONITORING NOTES - PRE-REMEDATION FIELD ACTIVITIES
WILMER MARSH UNIT, COLUMBIA NATIONAL WILDLIFE AREA
OCTOBER 6-9, 2014
SLR PROJECT 219.05112.00010**

Between October 6 and October 9, 2014, two SLR Consulting (Canada) Ltd. (SLR) representatives (Ms. Kalina Noel, R.P.Bio. – Biologist, and Ms. Corinne Couture – Junior Technologist) accessed the historical refuse site in the Wilmer Marsh Unit of the Columbia National Wildlife Area (the Site) to conduct field activities in support of remediation planning. These activities included:

- identification of the remaining debris in the marsh;
- identification of the limits of the buried and surficial debris areas in the trail;
- identification of a potential backfill source for the remediation activities; and
- collection of baseline surface water turbidity parameters.

Also included in the pre-remediation field activities were the completion of wildlife and wildlife tree surveys, specifically:

- completion of Western Toad and Western Painted Turtle surveys;
- completion of surveys for active American Badger dens at the Site; and
- completion of surveys to identify potential wildlife trees in the vicinity of the remediation works which may be impacted by the proposed remediation activities and to identify “no-work” buffer zones around the affected wildlife trees.

Site Reconnaissance

Following a review of SLR’s health and safety plan, SLR conducted a site reconnaissance to review site conditions. Areas seeded in Spring 2014, such as the uplands gully and 2013 trail test pits, were assessed for vegetation growth.

The sediment fencing and erosion control matting in the uplands gully area were observed to be undisturbed. No signs of erosion were observed and the sediment fencing and matting appeared to be functioning adequately. No seed growth was observed although weed species such as sweet clover and flixweed (Photo 1) were noted to be establishing in the gully.

The area around the test pits advanced in the trail were also observed to be stable and the erosion control matting and coarse woody debris appeared to be functioning adequately. No signs of seed growth were present (Photo 2). However, incursion of crested wheatgrass and other weed species from the north slope into the disturbed areas was observed (Photo 3).

The marsh shoreline was noted to be stable and continuing to re-vegetate (Photo 4). Willow stakes appeared to be growing adequately (Photo 5).

SLR collected two samples of surface water from the proposed marsh debris removal area for assessment of turbidity parameters (total suspended solids and total dissolved solids). The samples were submitted to ALS Environmental for laboratory analysis.

Surrounding Lands Reconnaissance

SLR also conducted a reconnaissance of the surrounding federal lands in the Wilmer Marsh Unit.

The fence line along the road southwest of the Site was found to have been cut and the rock barrier altered (Photos 6 and 7). Evidence of recent activity through the breach in the fence was noted (single track, likely a dirt bike).

SLR walked along Westside Road to identify potential backfill sources within the Wilmer Marsh Unit for future remediation activities. During the walkover, a moose head was observed in the road ditch (Photo 8). As hunting is prohibited in this area, SLR notified the local Conservation Officer (Sgt. Lawrence Umsonst, Columbia – Kootenay Zone).

During the reconnaissance for potential backfill sources, SLR identified dumping on an uplands bench north of the Site (Photo 9). The majority of the dumping appeared to be historic (old vehicles located downslope in areas overgrown by trees, some small tin can dumps) although some more recent debris (broken sheet glass) was also observed on the bench. As well, in an area closer to the road, there appeared to be slightly mounded terrain which was vegetated by disturbance species such as crested wheatgrass (Photo 10). This was noticeable as the surrounding areas were observed to be comprised of native grasses and other vegetation. Coordinates of the debris and the mound were recorded.

SLR did identify a potential backfill source along Westside Road (Photo 11). The potential source appeared to be comprised of similar soil to the trail area soils (i.e. upland bench glaciolacustrine materials). Westside Road has been cut into the upland bench in this location and the fence for the Wilmer Marsh Unit is located approximately 15-20 metres back from the road in this location. The coordinates of the potential backfill source were recorded. The source area appeared to be capable of supplying at least 1500 cubic metres of soil.

SLR also conducted reconnaissance in the Town of Wilmer to identify access points to the marsh for the upcoming sediment curtain installation and fish salvage work. An ATV trail to the marsh was identified at the north end of Moffat Avenue and is presumably located on provincial Crown land based on available land title information.

Marsh Debris

SLR completed an assessment of all debris present along the shoreline from the previously excavated marsh shoreline south to the provincial border. Readily identifiable debris was

photographed and Universal Transverse Mercator (UTM) coordinates recorded using a Trimble GeoExplorer unit.

Debris identified included metal (Photo 12), tires (Photo 13) and concrete (Photo 14). Coordinates and information on the material type were recorded for each piece of debris. In total, 105 pieces of debris were identified.

It is noted that numerous pieces of debris were visually identified outside the limits of the proposed marsh debris removal program. It is recommended that these areas be re-assessed in Winter 2014-2015 during the electromagnetic survey planned as part of the remediation activities to confirm that the pieces are spatially small and unlikely to pose a large physical hazard or contaminant degradation risk to ecological receptors.

Trail Debris and Adjacent Slope Debris

SLR conducted an assessment of debris along the trail and in areas to the south and north of the trail. Starting at the provincial border and moving north-westward, 63 points of metal debris were identified, including four tires, one ski, and three larger areas of debris identified using a polygon feature on the GeoExplorer unit (Photos 15-18). Polygons were used in areas where debris was small and too numerous to identify each piece with an individual UTM coordinate.

Along the trail and slope north of the trail, 13 pieces of surficial metal debris were identified. Wood debris piles and one piece of concrete were also noted. Larger areas of debris were mapped using a polygon which included a wood pile (Photo 19) and a pile of mixed wood and metal debris (Photo 20). The wood debris included lumbered wood with nails. One large piece of metal was observed north of the trail within an area of native vegetation (Photo 21).

SLR recorded locations of debris near the surveyed federal-provincial boundary which fell within the federal lands. The locations of thirteen additional pieces of metal debris, one piece of concrete and a piece of wood debris were recorded.

A final review of the uplands bench was made to assess if any debris had been left behind following clean up over the past years. Only one piece of metal debris was observed.

Expert Support Site Visit

Representatives from Environment Canada and Fisheries and Oceans Canada were present at the Site in the afternoon of October 9, 2014. The SLR project manager conducted a walkover inspection of the Site and reviewed the proposed remediation plans for the marsh and trail areas with the Expert Support representatives.

Survey Activities in Support of Remediation Planning

Based on previous correspondence with Environment Canada (letter dated November 25, 2010), a Species at Risk permit was not required for works completed previously in the marsh due to the low possibility of Species at Risk (SAR) occurring at the Site. However, further studies prior to the commencement of site activities were advised by Environment Canada, specifically wildlife surveys for Painted Turtle and Western Toad as well as identification of American Badger dens. Environment Canada also recommended the completion of wildlife tree surveys for the establishment of "no work" buffer zones during future remediation activities.

CWS also outlined terms and conditions for survey activities in the permit issued to SLR on September 23, 2014 to conduct the remediation planning activities.

SLR attempted to complete the wildlife and wildlife tree survey activities following the requirements outlined by Environment Canada and CWS as closely as possible. However, due to the time of year, species identified as concern under the CWS permit (BC-14-0041) could not be surveyed following the Resources Inventory Committee (RIC) standards. This limitation was acknowledged by CWS as a potential constraint to the survey work. The following sections describe observations made at the Site between October 6 and 9, 2014.

Western Painted Turtle (*Chrysemys picta bellii*, Intermountain-Rocky Mountain population)

SLR reviewed the marsh area on several occasions between October 6 and 9, 2014 for the potential presence of Western Painted Turtle in the proposed marsh debris removal area. Western Painted Turtles are identifiable by the red/orange colouration of the plastron and are listed as species of Special Concern under the Species At Risk Act (SARA).

On one occasion, a turtle was observed offshore in the water. As the turtle was too far from the shore to observe in detail, it was unknown if this was a Western Painted Turtle or another species.

On another occasion, two turtles were observed. A photograph of one of the turtles was attempted (see Photo 22). However, due to the distance from the shore and the turtle's limited exposure above the water surface, the photograph is not definitive for identification purposes.

On a third occasion, one individual turtle was again observed. As during the previous observations, the turtle was located too far offshore to allow definitive identification.

All turtles observed during the field survey were in the water and located too far offshore to determine if the plastron was coloured. As the turtles' plastrons were not clearly visible, SLR examined the heads of the individuals to see if other markings were visible (specifically, red colourations behind the eyes which are indicative of red-eared sliders). One turtle (as seen in Photo 22) was stationary for a period of time long enough to closely observe its head; no red markings were observed on the head. Red markings were also not cursorily noted on the heads of the other turtles observed.

SLR will continue to monitor the proposed marsh debris removal area for the presence of turtles during the sediment curtain installation and fish salvage activities which are scheduled for early November. The activities will involve work from aluminum boats which may allow closer observation of any potential turtles.

Given that proposed remediation activities in the marsh will be limited to the removal of debris and that there will not be any excavation or dredging of sediments in the marsh, disturbances in the marsh will be limited to the immediate vicinity of the debris being removed. Observations of turtles during the survey conducted in October 2014 identified up to two individuals. Given the low number of individuals and the relatively small area of the proposed work area (approximately 25 m by 70 m delineated by sediment curtain) and the even smaller scale of the individual pieces of debris compared to the larger marsh area, it is considered unlikely that any turtles will be present in the immediate vicinity of the debris removal works. However, it is recommended that "environmental response measures" be discussed with CWS in advance of

the project and incorporated into the tender specifications for the remediation project should a turtle be discovered during the debris removal program.

Western Toad (*Anaxyrus boreas*)

RIC surveys are to be conducted during migration and breeding seasons for amphibians. According to the British Columbia Ministry of Environment, Western Toads find winter hibernation sites following breeding. Hibernation sites include forested and grassland areas. Preferring damp conditions, toads may venture far from breeding grounds. The Western Toad is listed as a species of Special Concern under SARA.

As noted above, the Western Toad survey could not be completed according to RIC standards due to project timing. However, no toads were observed at the Site during SLR's activities. Although the Western Toad survey results are inconclusive due to timing constraints, it is considered unlikely that toads will be present in the water or sediment in the area of the marsh debris removal during the winter months (i.e. January-February 2015). Toads, if present, will be upslope of the marsh within the adjacent forested portions of the Site.

American Badger (*Taxidea taxus jeffersonii*)

One abandoned badger burrow was observed at the north end of the gully downslope of the trail area (Photos 23 and 24). Three entrances to the burrow were observed. The entrances were heavily overgrown by vegetation and lichens were present on the soil, suggesting that this burrow was abandoned a number of years ago.

A second abandoned badger burrow was observed to the south of the upper part of the trail (Photo 25). Two entrances were found, both covered in vegetation and lichens, suggesting that this burrow was abandoned a number of years ago as well.

The two burrow locations are near one another and may have been dug by the same individual. No current digging marks, soil piles or scat were observed at the burrows. Based on SLR's field observations, it is considered unlikely that a badger is actively using the area of the Site where the remediation activities are proposed. The American Badger is listed as an Endangered species under SARA.

Wildlife Trees and Native Vegetation Exclusion Zones

As part of SLR's survey activities, wildlife trees were also assessed. Four wildlife trees were identified (Photos 26-27) along the gully to the south of the trail. The coordinates of the trees were recorded with the GeoExplorer unit to allow for identification of "no work" zones during the proposed remediation activities.

To ensure that any native vegetation and plant communities present at the Site remain undisturbed during the proposed remediation activities, SLR delineated and obtained the coordinates of the native vegetation using the GeoExplorer unit. Two areas of native vegetation were identified; one area was located south of the trail (Photo 28) and the other was located north of the trail on the uplands bench (Photo 29).

SLR will incorporate the mapped wildlife trees and native vegetation areas into the remediation tender specification documents as prescribed exclusion zones which can be field-flagged during remediation as "no work" areas.

Fish and Other Species Observations

During the review of the marsh debris, SLR observed two different species of fish. One was likely a minnow species and the other a slightly larger unknown fish. Fish salvage activities are planned following the installation of the sediment curtain in the marsh. SLR has discussed the proposed fish salvage activities with Fisheries and Oceans Canada and has obtained a fish collection permit from the BC Ministry of Forests, Lands and Natural Resource Operations (permit CB14-155834) for the fish salvage activities.

As well, muskrat slides, tracks, scat and possible den entrances were also observed along the marsh.

SLR reviewed the proposed remediation work areas for other SARA-listed species (refer to Table B in SLR draft report 2013/2014 Site Works Summary and Remedial Action Plan Report). None of the SARA-listed species were observed in the proposed remediation work areas during SLR's inspections. It is noted that Hooker's Townsendia (*Townsendia Hookerii*) has previously been observed at the Site within the uplands bench native vegetation area which will be demarcated as a "no work" zone during remediation activities; Hooker's Townsendia is a provincially red-listed species but is not a SARA-listed species.

Yours sincerely

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Attachments: Photoplates

219.05112.00010 PreRemediationFieldActivities_Oct 2014.docx



Lindsay Paterson, M.Sc., P.Ag.
Project Manager



Photo 1: View of uplands bench gully seeded in spring 2014.



Photo 2: View of trail test pits seeded in spring 2014.



SITE PHOTOGRAPHS

Pre-Remediation Field Activities
Former Refuse Site – Wilmer Marsh Unit
Near Wilmer, British Columbia

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Photo 3: Incursion of crested wheatgrass and other weeds in areas disturbed by 2013 test pits.

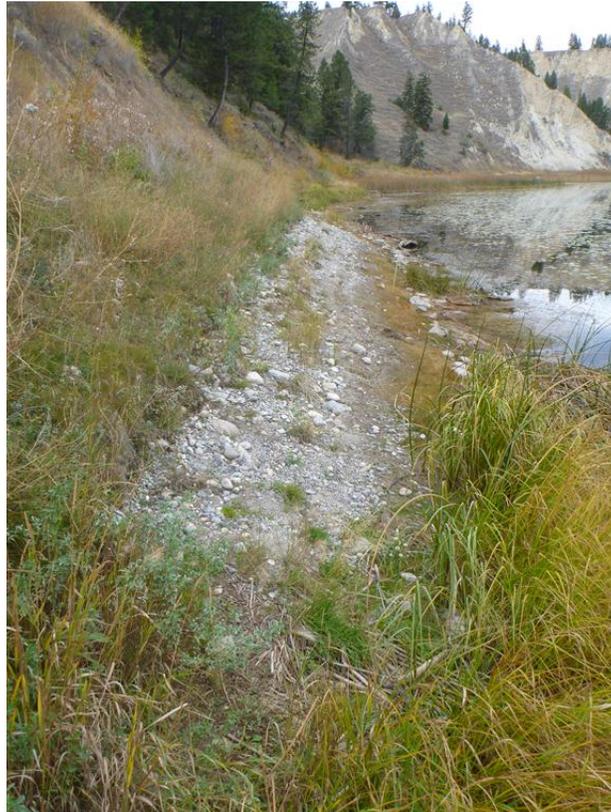


Photo 4: Marsh shoreline is stable and continuing to re-vegetate.



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Photo 5: Willow stakes continuing to grow at marsh.



Photo 6: Rock barrier altered presumably for dirt bike or ATV activity.



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Photo 7: Fence cut at entrance to old ATV trail.



Photo 8: Moose head observed along Westside Road – north of site.



SITE PHOTOGRAPHS

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Photo 9: Uplands bench north of site with observed historic dumping.



Photo 10: Mounded area on uplands bench north of site with disturbance vegetation (red dashed area).



SITE PHOTOGRAPHS

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Photo 11: View of proposed backfill source along Westside Road.



Photo 12: Metal tank observed within water in marsh area.



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Photo 13: Tire observed in water in marsh area.



Photo 14: Concrete block observed along marsh.



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Photo 15: Example of metal debris observed in gully located south of trail.



Photo 16: Example of tire observed in gully located south of trail.



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Photo 17: Example of surficial debris in trail area.



Photo 18: Example of partially buried debris in trail area.



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Photo 19: Area of wood debris observed along the trail.



Photo 20: Mixed wood and metal debris observed on slope north of trail.



SITE PHOTOGRAPHS

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Photo 21: One large piece of metal debris observed on the slope north of the trail.



Photo 22: Turtle observed in water along marsh.



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Photo 23: Abandoned badger burrow, view of entrance.



Photo 24: Abandoned badger burrow, view of entrances (denoted by red arrows).



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Photo 25: Abandoned badger burrow observed along upper part of trail (at red arrow).



Photo 26: View of wildlife tree observed in gully south of the trail (cavities present).



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Photo 27: Wildlife tree observed south of the trail.



Photo 28: Area of native vegetation identified south of trail (to left of red dashed line).



SITE PHOTOGRAPHS

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Photo 29: Native vegetation identified on the upland bench, north of the trail.



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