

**Environmental Effects Evaluation  
Remediation - AAFC Coalfields Community Pasture near Bienfait, SK**

**Prepared by:**

**EGE Engineering Ltd. on behalf of Public Services and Procurement Canada and  
Agriculture and Agri-Food Canada**

**PSPC Project No. R.061595.337**

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## REFERENCES

### **Project Plans and Drawings**

Figure 01 - Location Plan

Figure 02 - Site Plan

Figure 03 - Existing Site Conditions

Figure 04 - Impacted Areas

Figure 05 - Proposed Remedial Works

Figure 06 - Site Restoration

### **Photographs**

Included in text

### **Maps**

Included in text

### **Correspondence**

Transport Canada Navigation Protection Program - Navigation Protection Act Review

### **Permits and Authorizations**

Saskatchewan Water Security Agency - Aquatic Habitat Protection Permit

Fisheries and Oceans Canada - Fisheries Act Review

### **Related Environmental and Project Studies**

Noted in text

### **Other**

Saskatchewan Conservation Data Centre - Species Listing for 1.0 km radius



## PROJECT ENVIRONMENTAL EFFECTS EVALUATION FORM

### 1.0 CONTACT AND PROJECT INFORMATION

Project Title	Project #/ESU File #
Environmental Effects Evaluation, Tender Support and Site Supervision for Remediation - AAFC Coalfields Community Pasture near Bienfait, Saskatchewan	
<b>Contact For Project Proposal (Name, E-Mail Address, Phone Number )</b>	
<p><b>Public Services and Procurement Canada - Project Manager</b>                      Karen Hill - Senior Environmental Specialist, Environmental Services, Western Region                      Suite 100 - 167 Lombard Avenue                      Winnipeg, MB R3B 0T6</p> <p><a href="mailto:Karen.Hill@pwgsc-tpsgc.gc.ca">Karen.Hill@pwgsc-tpsgc.gc.ca</a>                      Phone: 204-984-4510</p> <p><b>Agriculture and Agri-Food Canada - Project Manager</b>                      Daryl Nazar - Environmental Coordinator, Community Pastures Program, Land Management Unit                      2010 12<sup>th</sup> Avenue, Room 300                      Regina, SK S4P 0M3</p> <p><a href="mailto:Daryl.Nazar@agr.gc.ca">Daryl.Nazar@agr.gc.ca</a>                      Phone: 306-523-6696</p> <p><b>Coalfields Pasture Patrons Group (provided for information)</b>                      Craig Gordon, Chairperson</p> <p><a href="mailto:cmgordon02@gmail.com">cmgordon02@gmail.com</a>                      Phone: 306-861-9548</p>	
<b>Project Location</b>	
<p><b>Coalfields Community Pasture near Bienfait, Saskatchewan.</b></p> <p>Project location is at the former pump house on the north side of the Souris River near the pedestrian bridge crossing (see Figure 01 and 02).</p> <p><b>Project Coordinates</b>                      Lat: 49° 6' 44.4" N Long: 102° 34' 50.3" W                      GPS (13U) 676553E 5442763N</p>	
<b>Project Description</b>	
<p>Included in the scope of work is the excavation and off-site disposal of 825 m<sup>3</sup> of polycyclic aromatic hydrocarbon (PAH) and petroleum hydrocarbon (PHC) contaminated soil from the upland area (top of slope north to the delineated limit of the excavation) and 260 m<sup>3</sup> of contaminated soil from the riverbank area (top of slope south to the water level). The scope of work does not include any work below the water level at the time of construction. The quantity of material on the riverbank will vary depending on the actual Souris River water level at the time of construction. The above quantities are used for design purposes.</p> <p>There is no clean overburden soil that requires excavation and segregation as the contaminated soil is located either at or near surface. All soil excavated from the site within the limits of the identified contaminated areas will be considered contaminated soil until confirmatory testing indicates clean (non-impacted) soil has been reached at depth and at the lateral limits of the excavation.</p>	

Soil that is required to be excavated from beyond the limits of the contaminated area (in order to provide safe side slopes of 2.5H:1V for excavation depths greater than 1.2 m to a maximum of 3.5 m and 1H:1V for excavation depths less than 1.2 m) is considered to be clean soil and will be stockpiled locally for reuse as backfill, after confirmatory testing is completed and verifies the soil is not impacted.

All of the impacted soil (1,085 m<sup>3</sup>) will be excavated for off-site disposal. The main remedial tasks include: demolition of the former pump house concrete foundation for off-site disposal; stripping the vegetation from the upland and riverbank areas; excavation and off-site disposal of the contaminated soil; backfilling; and site restoration (topsoil and seeding).

A concrete anchor block for the pedestrian bridge guy wires is located near the eastern limit of the proposed remedial excavation and will be avoided during remediation. Once the impacted soil has been removed, the excavated areas will be backfilled with clean fill. The riverbank area will be graded to an approximate slope angle of 3 horizontal to 1 vertical (3H:1V). A riprap rockfill erosion control blanket will be installed from just above the summer water level to the high water level. The disturbed work areas above the riprap blanket will be revegetated with topsoil and seed and an Erosion Control Blanket (ECB) will be installed on the riverbank slopes to mitigate erosion of topsoil before vegetation is established. No work will be completed in the Souris River.

The impacted soil excavated from the site will require disposal at a licensed soil treatment facility. The nearest facility is located near Gladmar, Saskatchewan (Gap Landfill), about 140 km from the site; however, the successful remediation contractor may propose alternate suitable disposal locations.

Expert geotechnical advice has been provided to develop the engineering specifications in order to ensure that an adequate level of stability of the riverbank is maintained during excavation and after site restoration.

**Are there any other authorities (local, provincial/territorial, or federal authorities) for this project that may issue an authorization or permit or have involvement in the project?**

Yes       None Identified      (If Yes, provide details in Section 2.7)

## **2.0 PROJECT DESCRIPTION**

### **2.1 PROJECT LOCATION**

The Coalfields Community Pasture (CP) is located about 10 km east of Bienfait, Saskatchewan in the Souris River valley. The entire pasture site is 6,443 hectares in size, and consists primarily of pasture and native prairie. The site includes a former operating yard on the south side of the Souris River; a former rider's cabin area on the north side of the Souris River; and three corral locations with barn/office structures. A general location plan is provided as Figure 01 and a site plan of the rider's cabin area (the remediation project site) is provided as Figure 02. A topographic survey of the site, completed in January 2018, is shown on Figure 03.

A significant flood event occurred in 2011 that damaged the majority of the buildings on the property (in the former operating yard and former rider's cabin area, but not the corral locations). As a result, the site was abandoned in 2012. The majority of the building interiors were stripped of materials and later in 2012 the Pasture Manager's residence was burned. In preparation for property divestiture, AAFC has completed a number of environmental investigations at the Coalfields CP.

The site investigations have identified an area of contaminated soil and sediment located at the former rider's cabin area, as shown on Figure 04. The former rider's cabins were located along the north bank of the Souris River, approximately 1.5 km east of the former operating yard. The site consisted of three structures, including two rider's cabins and a former pump house that was used as a garage. The rider's cabins were removed at the time of site abandonment in 2012. The last building (pump house) was removed during the 2015-2016 period, leaving only a concrete slab on-grade foundation remaining. The former pump house was a painted wood clad structure. The rider's cabins were metal clad trailers located just north of the pump house.

The site is accessed from a driveway located on the east side of the property, off of the gravel road that leads from Provincial Road 604, west towards the former operating yard. The cabins were located just west of a low level vehicle crossing over the Souris River leading to the operating yard portion of the site. A wooden swing bridge, built in 1969, is situated on the site to provide safe pedestrian travel across the Souris River at times of high water levels (when the low level vehicle crossing is impassable). During these times, vehicles are parked on both sides of the bridge to allow access to the former operating yard. A rock filled weir is located immediately downstream of the rider's cabin area and upstream of the pedestrian bridge.

### **2.2 PROJECT COMPONENTS AND PHYSICAL WORKS**

Included in the scope of work is the excavation and off-site disposal of 825 m<sup>3</sup> of contaminated soil from the upland area (top of slope north to the delineated limit of the excavation) and 260 m<sup>3</sup> of contaminated soil from the riverbank area (top of slope south to the water level). The scope of work does not include any work below the water level at the time of construction. The quantity of material on the riverbank will vary depending on the actual Souris River water level at the time of construction. The above quantities are used for design purposes.

Ex-situ treatment involving soil excavation followed by off-site disposal of the impacted soil is the selected remediation process for the site. A soil remediation landfill near Gladmar, Saskatchewan is able to accept the PAH (and PHC) impacted soil; however, updated soil quality information will need to be provided to the landfill operator in advance to secure approval to dispose of any soil at the landfill. The landfill operator is GAP Disposal (2016) Inc. (recently purchased from Progressive Waste Solutions). The landfill is located about 140 km west of the remediation site. Other disposal facilities may be available (such as the Newalta Corporation Class II Landfill at Swift Current, Saskatchewan or the Coal Creek Landfill at Bienfait, Saskatchewan) and the successful contractor may propose an alternate suitable disposal site.

Ex-situ treatment in the upland and riverbank areas involves excavations extending to anticipated depths of between 1.0 and 3.0 m below original grade, as shown on Figure 05. Once the excavation activities have been completed, engineered backfill will be placed and compacted to minimize long term settlement, to provide positive site drainage and to provide an adequate base for any potential future site development. Following site grading, re-vegetation of the disturbed areas will also be undertaken to minimize the potential for erosion.

A detailed summary of the proposed work is provided in the following sections. The proposed remedial works are also shown on Figures 05 and 06.

### 2.2.1 Site Preparation

Site preparation will include contractor mobilization and set-up, demolition of the concrete slab from the former pump house, monitoring well decommissioning, and clearing and grubbing. It is recommended that the Contractor laydown area be established north of the work site to avoid any adverse impacts to the riverbank stability. The Contractor laydown area may be used for the temporary stockpile of clean backfill during site restoration activities, but stockpiles will be limited in size (approximate quantity used as a reserve for one day of material placement).

Demolition will include the removal of the concrete foundation at the former pump house for off-site disposal as a construction waste (non-hazardous waste). The existing monitoring well (CF-33) will be decommissioned and the specified environmental mitigation measures (silt fencing) will be installed to prevent sedimentation in the Souris River during the upland and riverbank remediation activities.

In addition, prior to starting the excavation, clearing and grubbing is required to remove vegetation and trees within the area to be excavated. Clearing and grubbing will primarily be completed by hand method to avoid capturing surface soil since contaminated soil is located within the surface soil horizon.

Any activity that includes capture (excavation) of soil (including root mass) is considered to be contaminated soil remediation and the resulting soil and root mass will be disposed of as contaminated soil. Disturbance of the soil and vegetation beyond the work site and staging areas will be restricted to mitigate the environmental impact of the remediation work; however, to provide safe and stable side slopes for the excavation (2.5H:1V for excavation depths greater than 1.2 m to a maximum depth of 3.5 m and 1H:1V for excavation depths less than 1.2 m), some clean overburden soil will be excavated and stockpiled locally for reuse as clean fill material (providing verification sampling confirms the soil is not impacted).

To manage surface run-off, perimeter drainage swales will be established around the proposed excavation, outside of the contaminated soil area. Swales will be directed to the river or to ditching along the roadway adjacent to the site. Sediment control measures (e.g. silt fencing) will be implemented at the outlet(s) of the drainage network to minimize the risk of sediment transport to the river. The layout of drainage swales will be performed on-site by the Contractor and approved by the Departmental Representative.

### 2.2.2 Excavation of Contaminated Soil

The approximate area to be excavated is shown on Figure 05, along with the proposed excavation depths. The area to be excavated includes all of the delineated upland and riverbank soil that was found to be contaminated up to the limit of the normal summer water level along the Souris River.

The proposed excavation depths are based on the vertical delineation of the contaminants. Based on this information three excavation depths are anticipated for the upland and river bank soil:

- 1.0 m excavation depth on the western side of the impacted area and western riverbank;
- 2.0 m excavation depth below the concrete foundation of the former pump house and the central and eastern riverbank area; and;
- 3.0 m excavation depth north of the concrete foundation of the former pump house.

The deepest excavation will be located north of the former pump house and remaining concrete foundation. This area is approximately 85 m<sup>2</sup> and will be excavated to a planned depth of 3.0 m, which is expected to be just above the water table. A total of 255 m<sup>3</sup> of impacted soil is located in this section.

The excavation will transition from 3.0 to 2.0 at the north edge of the former pump house and current concrete foundation. The area of 2.0 m depth excavation on the upland portion of the site extends south to the top of the slope and then down the bank to the design elevation at toe. This area is estimated at 280 m<sup>2</sup> and includes 560 m<sup>3</sup> of impacted soil.

From the west edge of the former pump house and current concrete foundation, the excavation transitions to a depth of 1.0 m in a westward direction and also extends south to the top of the slope and then down the bank to the design elevation at the toe. This area is estimated at 270 m<sup>2</sup> and includes 270 m<sup>3</sup> of impacted soil.

The total area to be excavated is 670 m<sup>2</sup>, which includes 475 m<sup>2</sup> on the upland portion of the site and 195 m<sup>2</sup> along the riverbank to the water level. The total volume of impacted soil to be excavated is estimated at 1,085 m<sup>3</sup>, and consists of 825 m<sup>3</sup> on the upland portion of the site and 260 m<sup>3</sup> along the riverbank to the water level. As noted earlier, these quantities are approximate and will vary based on the water level in the Souris River at the time of construction.

Excavations will be constructed in accordance with the *Excavating and Trenching Safety Guide* provided by the Government of Saskatchewan Occupational Health and Safety division. For excavations greater than 1.2 m to a maximum of 3.5 m, side slopes of 2.5H:1V, extending from the excavation toe to the ground surface (no vertical faces) are recommended. Maintaining the stability of the excavation slopes for the duration of construction should be the responsibility of the Contractor.

Stockpiles of excavated material and heavy equipment will be kept away from the edge of the excavation by a distance equal to or greater than the depth of excavation. In addition, no stockpiling of material above original grade will be permitted within 10 m of the top of riverbank. It is recommended that contaminated material not be stockpiled on-site, but placed directly into trucks and transported from the site for off-site disposal.

Should stockpiling during the work be required within the excavation area, stockpile heights will be limited to the original prairie elevation so as not to induce loading on the riverbank. Stockpiles of backfill material will be acceptable within the laydown area, but will be limited to an approximate quantity that can be placed in one day. This will avoid any potential concerns associated with large stockpiles adjacent to roadways and ditching.

A concrete anchor block for the pedestrian bridge guy wires is located near the eastern limit of the excavation and will need to be avoided during excavation. In the absence of construction details showing the foundation type, it is recommended that the edge of excavation be setback a minimum of 3.0 m away from the anchor. A similar setback distance is used from the weir structure at the edge of the riverbank.

The anticipated excavation depths within the upland and the top of bank areas are shown on Figure 05. Based on these excavation limits, it is anticipated that the excavation base will be not be required to be deeper than the groundwater level, which was measured at 518.6 m, with the exception of the area directly adjacent to the river. As the excavation approaches the shoreline, the depth will be restricted to no deeper than 518.6 m to avoid groundwater infiltration and seepage from the Souris River. This depth should be sufficient to remove all impacted soil from the bank area.

With the above restriction, access along the excavation base is not expected to be a concern provided that any minor seepage or overland water is directed to a sump and pumped out for the duration of the work. However, if groundwater levels vary from those measured or if soft areas are encountered it may be necessary to place granular fill above non-woven geotextile to construct an access platform. Granular fill placed on-site for this purpose should consist of 300 mm of well-graded Type 8 sub-base course (Saskatchewan Highways and Transportation Specification 3300) or approved equivalent above non-woven geotextile (Geotex 801 or equivalent).

Dewatering measures should be completed as necessary to maintain a dry excavation and permit proper completion of the work. If seepage is encountered, it should be directed to a sump pit and pumped out of the excavation. Water entering the excavation will be considered contaminated and should be removed as discussed below. If saturated silts are encountered, shoring or slope flattening may be required. To prevent wet silts from entering the excavation (if encountered), gravel buttressing could be used in conjunction with sump pits for dewatering. Surface water should be diverted away from the excavation and the excavation should be backfilled as soon as possible following excavation of the contaminated soil.

A dewatering system is not required based on the relatively shallow excavation depths; however, some seepage and infiltration may occur on the upland portion of the site, and seepage is expected to occur along the river bank as the excavation approaches the water level. Control of groundwater/surface water infiltration will be required since any water collecting in the excavation will be considered contaminated. A hydrovac truck will be required on standby during the riverbank excavation work to collect and properly dispose of any impacted water from the excavation and collected in the sump.

Any groundwater/surface water infiltration that contacts the exposed excavation surfaces will be considered contaminated, until such time as confirmatory testing indicates that non-impacted soil has been reached at the

lateral and vertical limits of the excavation. After this point, and during backfilling, groundwater/surface water infiltration would only be in contact with non-impacted soil; and therefore, the water would not need to be disposed of as a contaminated liquid.

Following completion of the excavation work and verification sampling of the base and side walls of the excavation, to ensure the limits of the excavation have been reached and all impacted soil has been removed, the excavated areas will be backfilled with clean fill.

### **2.2.3 Verification Sampling**

Soil samples will be collected from the base and side walls of the excavation limits to confirm that the impacted soil has been removed and that the remediation targets have been met. The verification (confirmatory) sampling will employ the following protocols:

- Side walls will be sampled at 1 m vertical intervals every 15 lateral metres (i.e. a 1.0 m depth excavation will have one vertical sample, a 2.0 m excavation will have two vertical samples, etc.); and
- Base samples will be collected for every 100 m<sup>2</sup> area (i.e. 10 x 10 m area);

Interim soil samples may be collected for laboratory analysis when the excavation limits are approached or when the conditions encountered in the field vary from those expected. Soil samples will also be collected for on-site real time combustible organic vapour screening on an as-needed basis to help guide the excavation activities.

The clean backfill source will be sampled (minimum three samples) prior to project initiation to confirm the backfill material meets the remediation target levels and selective loads will also be sampled as they are brought to site. Additional parameters may be specified for the clean backfill analytical testing (such as metals, salinity, etc.).

As noted earlier, current samples of the contaminated soil may also be required by the receiving contaminated soil disposal facility and these will need to be collected, analyzed and submitted prior to project initiation. The analytical testing required will be based on the receiving facility, but is likely to include PHCs and PAHs as well as waste disposal criteria such as leachable benzene, toluene, ethylbenzene and xylenes (BTEX), leachable metals, flash point, pH and free liquid.

### **2.2.4 Backfilling and Site Restoration**

Backfilling operations will commence following confirmation that all contaminated soil has been removed from the work area. It is recommended that the backfill material be of similar type to the material excavated from the site and have similar drainage characteristics. Based on discussions with material suppliers based out of Estevan, Saskatchewan, granular fill is readily available from several gravel pits in the region. The granular fill will be well graded, with an even distribution of particle sizes. A Type 8 sub-base course material (Saskatchewan Highways and Transportation Specification 3300) is recommended. Backfill will be spread in lifts no greater than 150 mm and compacted to 95% of standard proctor maximum dry density (SPMDD) with standard construction equipment to allow for future grade-supported structures at the site.

A geotechnical drilling investigation (reported dated March 19, 2018) was completed on-site and a slope stability analysis was conducted to evaluate the pre-construction riverbank stability condition and to assess the relative change in stability associated with modifications to bank geometry during backfilling and restoration. No signs of existing bank instabilities were identified and as such the existing stability condition was considered a reasonable baseline for assessing relative change. The restored riverbank geometry should result in an equal or greater level of stability as compared to the pre-construction condition and ensure positive drainage towards the river.

The stability analysis was carried out using a 2-dimensional limit-equilibrium stability model (Slope/W) from the GeoStudio 2016 software package assuming circular slip surfaces. A search was used to determine the potential slip surface (deep seated) with a minimum factor of safety (FS) using the Morgenstern-Price method of slices and a half-sine interslice force function. An effective stress analysis was used and is considered appropriate given the material types encountered at the site.

The stability model was completed on one cross-section running perpendicular to the river located approximately 2 m west of the existing concrete slab (former pump house). The approximate limit of PAH impacted soil was transposed onto the cross section and was used to evaluate and select a proposed regraded slope location that minimizes required backfill material while maintaining a relative improvement on bank stability.

Based on results of the analysis, it is recommended that the reconstructed riverbank slope not be steeper than 3H:1V in order to provide an improvement to original bank stability conditions. Flattening the slope to a 3H:1V and placing a 0.6 m thick rockfill riprap blanket from the river level to the HWL would provide a relative improvement in the order of 50% and minimize backfill quantities. Based on this riverbank geometry and considering the upland excavation areas (including side-slopes), the estimated neat-line backfill volume is 1,075 m<sup>3</sup>. This is the recommended reconstruction option. The proposed site restoration activities are shown on Figure 06.

The riprap blanket has been set at a 0.6 m thickness with a specific gradation requirement included in the engineering specification. The total riprap quantity is estimated at 325 m<sup>3</sup> (650 tonnes). The riprap will be extended from the shoreline to the HWL and will be underlain by non-woven geotextile (575 m<sup>2</sup>).

Revegetation of the riverbank and upland areas will be completed and consist of a minimum of 100 mm of topsoil and a selected seed that is consistent with natural prairie and riparian vegetation. The seed mix noted in the project specification was 40% creeping red fescue, 20% chewing red fescue, 20% perennial ryegrass and 20% Kentucky bluegrass and the mixture must be approved by AAFC. All areas disturbed by construction equipment and/or excavation areas that are upslope of the riprap will be restored using topsoil and seed. Dormant seeding will likely occur in October 2018 with establishment in the spring of 2019 and allowance for reseeding and weed control if required. Seed placement is expected to be by manual drop seeder, followed by light raking and rolling.

An erosion control blanket will also be installed in the disturbed areas on the riverbank from the new top of bank and extending down to the riprap. A fully biodegradable erosion control blanket, such as the North American Green product BioNet C125BN (or equivalent), can be used to eliminate the need to remove the blanket. The area of topsoil and seed (800 m<sup>2</sup> including 350 m<sup>2</sup> below the top of the regraded bank and 450 m<sup>2</sup> in the upland area), and area of erosion control blanket (375 m<sup>2</sup>), are shown on Figure 06.

### **2.2.5 Environmental Protection Measures**

The project specifications include the requirement for the Contractor to prepare and submit an Environmental Protection Plan prior to site mobilization. The Plan will include a Sediment and Erosion Control Plan, a Waste Disposal Plan, an Air Pollution Control Plan, a Contaminant Prevention Plan and a Wastewater Management Plan.

Several environmental protection measures have been described above, including drainage swale construction to control overland flow, installation of silt fencing to prevent sedimentation in the Souris River, placement of erosion control blankets and riprap to improve the bank geometry and stability, and soil stockpile height and location restrictions to minimize erosion potential. Additional standard environmental protection measures are provided in the engineering specification, including:

- Diverting runoff away from the exposed soil;
- Minimizing runoff velocities with appropriate grading and berms;
- Restricting equipment refueling within 100 m of the HWL or any tributary;
- Inspecting all equipment to ensure that no external oil or leaks exist that could introduce hydrocarbon products directly or indirectly into the river;
- Restricting the location and placement of temporary sanitary facilities for construction workers to avoid the potential for spills that could enter the river; and
- Minimizing the duration of soil exposure through the use of appropriate construction schedules, seeding, and/or erosion control blanket, where necessary.

An erosion and sediment control monitoring program will be carried out and will focus on all measures employed or needed to prevent erosion on site and migration of eroded soil off-site or into the Souris River. The erosion

and sediment control monitoring program will entail the following, in addition to monitoring and recording of general site conditions:

- The Departmental Representative will twice daily conduct a visual inspection of all upland and riverbank erosion and sediment control works; and
- The Contractor will modify and repair all works that are not functioning adequately, under the direction of the Departmental Representative.

Environmental Response plans will be prepared by the Contractor for approval by the Departmental Representative prior to commencement of work at the site. These plans will include spill response plans, which will include notification of SK MOE and Environment and Climate Change Canada, as required under the Canadian Environmental Protection Act (CEPA).

The spill response plans will be triggered by on-site incidents such as fuel spills, as well as releases of contaminated soil or runoff to the river.

### **2.3 CONSTRUCTION SCHEDULE**

The field time required to excavate 1,085 m<sup>3</sup> of contaminated soil and transport the impacted soil for off-site disposal, is estimated at about seven to ten days. There would be another three to five days required to backfill the excavation with clean imported granular fill, along with two to three days at the onset of the project, for general site preparation, demolition, decommissioning and installation of environmental mitigation measures.

The total field time required for the upland and riverbank soil excavation is estimated at about fifteen days.

It will be possible to conduct the remediation of the AAFC Coalfields CP site in any season, but each season presents advantages and disadvantages with respect to constructability and environmental protection. These are described briefly below.

The spring season presents the highest risk of problems associated with erosion and sediment control on-site, due to potential for wet soil and heavy rains. It is also the season of highest environmental sensitivity in the Souris River due to the potential presence of sensitive life stages of fish. For the Souris River, DFO has stipulated a restricted Timing Window, from April 1 to May 31, in which no instream work should be conducted, based on the presence of spring-spawning species (such as Walleye), but not Lake Sturgeon (*Acipenser fulvescens*). For these reasons, the remediation work at the AAFC Coalfields CP site will not be planned for the spring season, and no work below the HWL will be conducted between April 1 and May 31.

For many projects, winter can be preferable for construction because fish are least active and do not have sensitive life stages present. However, frozen conditions are not amenable to construction work such as that proposed for remediation of the AAFC Coalfields CP site, which will include excavation and backfilling of soil with compaction required to establish stable upland and riverbank areas. Planning the project for winter would also extend the overall construction timeframe, as final grading and revegetation would need to be completed after the site dried sufficiently in the spring. Furthermore, as the project site likely provides overwintering habitat for fish, winter construction would not provide a benefit over summer construction for this project in terms of protection of fish habitat. Lastly, site conditions observed in 2015 and 2016 have shown substantially higher water levels in the winter (520.4 m) versus summer (518.5 m). This factor would necessitate a much greater portion of the work be conducted with wet materials.

The late summer / fall season (prior to the end of October when releases from the Rafferty reservoir are initiated) generally has the lowest flows in the Souris River and presents the least potential for problems associated with wet soil conditions and heavy rainfall events. These conditions facilitate the shortest possible construction schedule, minimize the potential for erosion and promote the earliest stabilization of soil and re-establishment of vegetation on upland soil and the riverbank in the spring.

For these reasons, late summer/early fall is the preferred season in terms of constructability and environmental considerations.

The public tender closing date for the project has been set at July 31, 2018. The estimated award date is August 2018 and the estimated construction date is September and/or October 2018.

## 2.4 OPERATION DESCRIPTION

The soil remediation project is being completed to facilitate divestiture of the property. Upon completion of the project there will be no operating facilities, equipment or structures at the project site and the site will be considered vacant.

## 2.5 WASTE MANAGEMENT

Waste management for the soil remediation project will include control and proper disposal of all contaminated soil and liquids generated during the project, as well the proper disposal of non-hazardous construction waste from demolition and generated by the Contractor while on-site.

Contaminated soil will be transported to a licensed soil treatment and disposal facility (selected by the Contractor) that is permitted to receive the material. Non-hazardous waste materials (concrete demolition waste and normal construction waste) will be transported to the nearest waste disposal ground for disposal.

Any liquids entering the excavation that require control (pumping) will be collected by vacuum truck and transported to a licensed waste disposal facility (selected by the Contractor) that is permitted to receive the material.

## 2.6 LEGISLATION AND PERMITS

The project has undergone self-assessment under the Fisheries Act with regulatory review completed by Fisheries and Oceans Canada (DFO) and the Saskatchewan Water Security Agency (SK WSA). Authorization for the project has been received from DFO and SK WSA. Saskatchewan Ministry of Environment has also been notified of the project through submission of a Corrective Action Plan (CAP); however, there is no regulatory requirement for authorization as the project is located on federal land. The previous application for review under the Navigation Protection Program (NPP) administered by Transport Canada was formally withdrawn following the revision to the scope of work that eliminated all activity within the Souris River. No authorization is required under the NPP.

<b>Are there any other authorities (local, provincial/territorial, or federal authorities) for this project that may issue an authorization or permit or have related involvement in the project?</b> <input checked="" type="checkbox"/> Yes <input type="checkbox"/> None Identified		
Department / Agency Name	Contact Person and Contact Details	Permit/Authorization/Approval Issue
Fisheries and Oceans Canada	Jessica Epp-Martindale, Fisheries Protection Biologist	Request for Review submitted April 3, 2018. Reply received April 12, 2018 noting that an authorization under the Fisheries Act is not required and the project can proceed.
Transport Canada - Navigable Waters	Inga Thorsteinson, Navigation Protection Program Officer	Application to review project (NPP file 2017-600023) formally withdrawn by e-mail on January 10, 2018 (based on revised scope of work to eliminate sediment remediation). No authorization required from Transport Canada Navigation Protection Program.
Saskatchewan Water Security Agency	Adam Matichuk, Aquatic Habitat Protection Specialist	Application for Aquatic Habitat Protection Permit submitted April 3, 2018. Permit received April 18, 2018.
Saskatchewan Ministry of Environment		Corrective Action Plan submitted to Saskatchewan Ministry of Environment for information only. No authorization is required as the project is located on federal land.
Crown Indigenous Relations and Northern Affairs Canada	Jen Kato, Regional Subject Expert, Consultation and Accommodation Unit	Consulted to verify ATRIS findings, confirm that the assessment of no adverse impacts to Treaty or Metis rights is valid and review Duty to Consult obligation.

**Are there any other authorities (local, provincial/territorial, or federal authorities) for this project that may issue an authorization or permit or have related involvement in the project?**

Yes       None Identified

Department / Agency  
Name

Contact Person and Contact  
Details

Permit/Authorization/Approval Issue

**Please provide additional details below:**

Other regulatory agency may have involvement in the project as noted below.

**Saskatchewan Water Security Agency - Hydrology and Groundwater Services**

To prevent risks to the project associated with the possibility of increases in river flows, the SK WSA will be notified of the planned work so that maintenance checks on the Rafferty Dam can be scheduled in such a way that they do not interfere with the project. The following SK WSA manager can be contacted by phone for this purpose:

Mr. Curtis Hallborg  
Manager, Flow Forecasting and Operations  
[Curtis.hallborg@wsask.ca](mailto:Curtis.hallborg@wsask.ca)  
306-694-3942

Mr. Hallborg has advised that he be contacted approximately one month before commencement of any work and again just prior to the commencement of work.

**SaskPower and SaskTel**

For the same reasons that the SK WSA will be contacted regarding the operation of the Rafferty Dam, SaskPower will be contacted to prevent problems associated with operation of the Boundary Dam.

The following SaskPower representative may be contacted for this purpose:

Doug Kilgour, P.Eng.  
Manager, Dam Safety  
SaskPower  
2901 Powerhouse Drive  
Regina, SK S4N 0A1  
p. 306-566-2854  
email ([dkilgour@saskpower.com](mailto:dkilgour@saskpower.com))

Additionally, SaskPower and SaskTel will be contacted to discuss the overhead utility line and utility pole located on-site.

### 3.0 SCOPE OF THE ENVIRONMENTAL EFFECTS EVALUATION

#### 3.1 SCOPE OF PROJECT

The full scope of the project has been described in Section 2 above. As noted this includes the following construction activities:

- Site preparation including installation of silt fence around perimeter of site, relocation of electrical utility pole and overhead line, and development of contractor staging and laydown areas;
- Demolition of concrete foundation for off-site disposal;
- Groundwater monitoring well decommissioning (CF-33);
- Vegetation removal/stripping;
- Excavation of contaminated soil;
- Transportation of contaminated soil for off-site disposal at a licensed soil treatment facility;
- Control of liquids in the excavation as required (with proper off-site disposal);
- Backfilling and compaction the excavation with clean soil;
- Placement of riprap erosion protection from toe of slope to high water level;
- Placement of erosion control blanket from high water level to top of slope; and
- Site restoration including topsoil and seeding.

Following construction, the site will be divested by AAFC; therefore, there are no operational, maintenance or decommissioning components associated with the project.

#### 3.2 SCOPE OF EVALUATION

**Space limits:** The study area must include the entire area of influence of project components, being the area where direct and indirect environmental effects occur. The spatial boundary for this project is:

- The project site (as shown on Figure 02) which includes the area of contaminated soil as well as surrounding areas that could be disturbed by the contractor activities (i.e. staging and laydown areas, non-impacted soil excavated to provide safe side slopes, etc.);
- The project area, which includes a 1.0 km radius around the project site; and
- The project region, which includes the RM of Coalfields No. 4 and any other locations in southeastern Saskatchewan that could be affected by the project (i.e. soil disposal location).

**Time limits:** The period of the environmental effects evaluation must include the construction, operation and decommissioning of the project to allow consideration of all impacts in the short, medium and long term. The temporal boundary for this project is:

- The project construction period is expected to be between September and November 2018 with the potential for seasonal deficiencies that may be addressed in the spring of 2019;
- The property has been divested and transferred back to the Province of Saskatchewan. AAFC is currently completing the required remediation of the property; and
- All project effects are expected over the short and medium term and are not expected to extend beyond 2019.

## 4.0 ENVIRONMENTAL DESCRIPTION

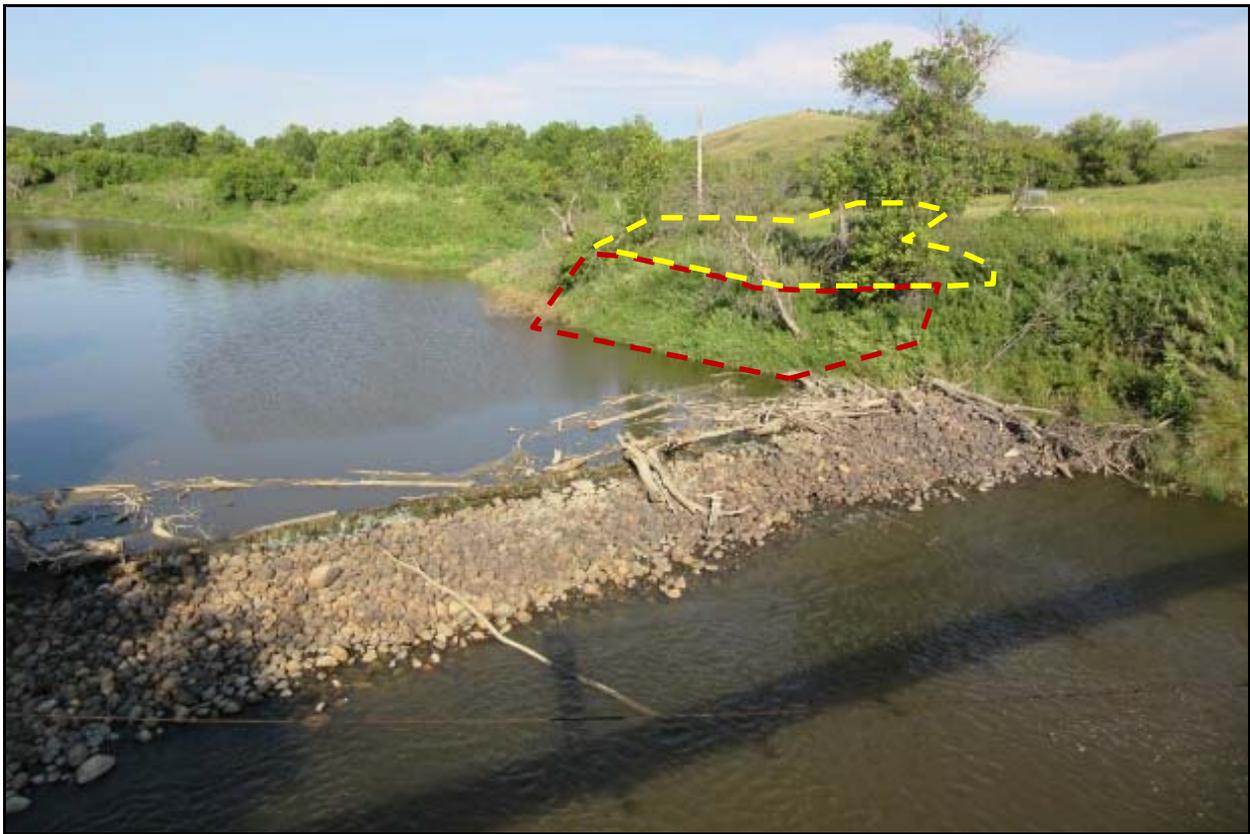
### 4.1 PHYSICAL ENVIRONMENT

#### 4.1.1 Surficial Conditions

The project site has not been reclaimed and consists of a concrete slab on grade foundation at the former pump house, a gravel/dirt road and turnaround, and overgrown vegetation, consisting primarily of noxious weeds (Canada thistle, perennial sow thistle and burdock).

An overhead telephone/power line is located west of the former pump house, with one utility pole located near the top of the river bank southwest of the former pump house. A buried water line is thought to be located north of the pump house, extending west, then north from a hydrant near the northeast corner of the concrete foundation. A buried electrical line is also located in this area.

A topographic survey of the site, completed in January 2018, is shown on Figure 03.



*Photo 01: Project site looking northwest from wooden swing bridge (August 2016). Approximate riverbank remediation area outlined in red and upland soil remediation area outlined in yellow. The existing rock-filled weir is located at the eastern limit of the project site.*



*Photos 02 and 03: Foundation of former pump house (left, August 2016) and former pump house prior to demolition (right, August 2015).*



*Photo 04: Top of river bank and well CF-33 (August 2016).*

*Photo 05: Drilling CF-33 (August 2015).*



*Photos 06 and 07: River bank area and former pump house building (January 2016). Note that the winter ice level in 2016 was higher than the normal summer water level and 2018 winter ice level.*

#### **4.1.2 Local Geology**

Previous site investigations have included drilling twenty-eight test holes in the upland soil and river bank area of the site. The test hole locations are illustrated on Figure 04 and copies of the individual test hole logs are provided in Attachment B. The soil generally consists of a thin layer of topsoil and/or clay, overlying sand to the maximum depth of the test holes (4.5 to 6.0 m). One deep test hole (CF-59) was drilled in the upland portion of

the site to a depth of 9.0 m and encountered clay soil at a depth of 5.4 m below grade. Clay was also noted at CF-53 and CF-61, at depths of 3.0 and 4.2 m, respectively. The sand was generally tan to brown, silty, fine grained and dry. The following is a brief discussion on the individual stratigraphic units encountered at the site. Detailed soil descriptions are also provided on the individual test hole logs provided in Attachment B and in the Geotechnical Report prepared by TREK Geotechnical dated March 19, 2018.

### **Clay**

Clay was found at surface at twenty of the twenty-eight test holes and extended to depths ranging from 0.3 to 1.5 m below grade. The clay was typically brown, with trace to some silt, trace to some sand and rootlets near surface, was moist, soft and of low to high plasticity.

### **Sand**

Sand was noted beneath the surface clay or from surface at twenty-two of the twenty-eight test holes and extended to depths ranging from 0.9 to 6.0 m below grade. The sand was brown to tan, contained trace to some clay and silt, and typically became wet between depths of 3.1 and 4.6 m below grade. The sand was described as fine to very fine grained. A layer of cobbles was also encountered within the sand layer, between a depth of 1.5 and 2.7 m, at five test hole locations (CF-33 through CF-36 and CF-59). Test hole CF-33 also refused on suspected cobbles at a depth of 5.1 m below grade.

Grain size analyses were completed on samples of the sand in 2011, but not from locations at the rider's cabin area. The sample depths were 0.31 and 1.42 m and the results indicated 60 and 58% of the material was retained on the #200 sieve (0.075 mm), respectively.

### **Clay Till**

Clay till was noted to overlie the lower clay, between a depth of 3.0 and 3.6 m below grade, at one test hole (CF-53), located east of the former pump house. The clay till was tan and contained silt and sand, and was moist and soft.

### **Clay**

Clay was encountered at depth at three of the twenty-eight test holes (CF-53, CF-59 and CF-61). The upper surface of the clay was encountered at depths ranging from 3.6 to 5.4 m below grade and extended to the maximum depth of the test holes (4.5 to 9.0 m). The clay varied slightly at each of the three test hole locations. At CF-53, the clay was tan, with silt and trace sand, moist and soft. At CF-59, the clay was grey, moist, firm and had a high plasticity. At CF-61, the clay was brown, sandy, firm and had a medium plasticity.

#### **4.1.3 Groundwater Conditions**

Monitoring wells were previously installed at test holes CF-04 and CF-33. Construction details are provided on the individual test hole logs presented in Attachment B. The well locations are highlighted on Figure 04. The well at CF-04 was monitored on March 3, 2011 and both wells were monitored on August 20, 2015.

The results from the previous monitoring indicate that the groundwater levels at the site range between local elevations of 518.6 m at CF-33, south of the former pump house and close to the Souris River, and 519.1 m at CF-04, further to the northwest. This corresponds to depths below grade of 3.0 m at CF-33 and 3.7 m at CF-04. Local groundwater conditions may vary seasonally, annually or as a result of construction activities.

#### **4.1.4 Topography**

The pasture slopes from the north and the south towards the valley of the Souris River, which bisects the pasture in a west to east direction. The pasture elevation at the prairie level, along the Souris River valley, is approximately 540 m asl. The land is typically flat to undulating, with a predominant slope towards the meandering river.

A topographic survey was completed for the project area in January 2018 and is shown on Figure 03. In general, the ground surface at the site slopes gently toward the river from the upland area to the top of river bank at an

approximate grade of 10 horizontal to 1 vertical (10H:1V). The slope from the top of the bank to the river level is at an approximate grade of 2H:1V to 3H:1V. Below the river level, the channel bottom slopes gently at 11H:1V to 14H:1V to the thalweg. The deepest measured channel elevation is at an approximate elevation 516.7 m, which is 1.9 m below the normal summer water level of 518.6 m (and similar to the 1.8 m channel depth shown on the CPR plan (Plate 03)).

Based on the above survey, the following local elevations have been used in the design of the soil remediation:

- High water level (HWL) - 520.2 m, based on the highest winter ice level observed in January 2016 (as discussed below, water is released into the Souris River to raise the level in winter);
- Normal summer water level - 518.6 m, based on the lowest measured weir elevation and consistent with an approximate average of water levels observed in August 2015 and August 2016;
- Groundwater - 518.6 m, based on the water level in CF-33 and the approximate normal water level in the Souris River (stability analysis used the highest groundwater level recorded on-site based on short-term observations during the geotechnical investigation, which was 519.5 m); and
- Top of weir - 518.6 m (south end) to 518.8 m (north end) corresponding to the top of the timber cribbing.

#### 4.1.5 Hydrology

Regionally, the area is part of the Upper Souris River watershed, which forms part of the Red River basin drainage system. Locally, the nearest surface water body is the Souris River, which bisects the Coalfields CP in a west to east direction. The Souris River rises in the Yellow Grass Marshes north of Weyburn, Saskatchewan and wanders south through North Dakota, beyond Minot, and then back north into Manitoba. The river then passes through the communities of Melita, Hartney, Souris and Wawanessa, and on to its confluence with the Assiniboine River about 40 km southeast of Brandon. The majority of the drainage basin is fertile silt and clay deposited by former glacial Lake Souris.

The Saskatchewan portion of the river is regulated upstream of the AAFC Coalfields CP by the Boundary Dam, which was constructed in the 1950's and by the Rafferty Dam, which, together with the Alameda Dam (on Moose Mountain Creek, downstream of the site), was constructed and became operational between 1985 and 1994. However, annual flow volumes still vary widely due to variation in annual precipitation. A major flood event, described as a one-in-600 year event, occurred in 2011.

Seasonally, flows in the Souris River at the AAFC Coalfields CP are controlled by operation of the Rafferty Dam, approximately 38 km west of the site, with some influence on flows at the site through the summer and occasionally in the fall, from local runoff downstream of the dam and from Short Creek, which flows into the Souris River from the south, between the Rafferty Dam and the AAFC Coalfields CP site.

The normal operating regime for the Rafferty Dam is to raise the reservoir to full supply level (FSL) in the spring, with diversion of water from the Boundary Reservoir as necessary, and to keep the reservoir level as close to FSL as possible through the summer and fall. Consumptive and evaporative losses in the reservoir normally exceed inflows; therefore, no releases to the Souris River generally occur between the spring and fall, as no downstream minimum flow requirement exists. During the winter, and typically commencing on October 31 of each year, water is released from the reservoir to draw the water level down to one metre below FSL to provide spring flood storage capacity. The operation of the Boundary Dam is similar.

For the reasons described above, discharge in the reach of the river in the vicinity of the AAFC Coalfields CP is highest in the winter and generally near or at zero through the summer and fall, except during periods of local runoff. Occasionally, some water is released from the Rafferty Reservoir in the summer or fall for the purpose of maintenance checks on the gate operation or to alleviate temporary community problems, such as poor water quality at the golf course near Estevan.

A real time Water Survey of Canada (WSC) monitoring station (Station 05NB036) is located on the Souris River downstream of the Rafferty Reservoir (38 km west of the AAFC Coalfields CP). The hydrometric data graph showing water level and discharge in the Souris River for the period from September 1, 2016 through March 1, 2018 is provided on Plate 04 below.

As noted on the graph, water levels in the Souris River at WSC Station 05NB036 between September 2016 and March 2017 were typically between 1.4 and 1.7 m, with spikes seen during brief releases from the Rafferty Dam. Discharge was typically less than or equal to 0.1 m<sup>3</sup>/s, but was higher in April 2017 (2.4 m<sup>3</sup>/s) during a spring melt and September 2017 (1.7 m<sup>3</sup>/s), likely after a precipitation event.

Historical flow measurements are available from 1992 and indicate a peak flow of 550 m<sup>3</sup>/s at the station and a peak level of 7.0 m associated with a summer precipitation event (late June 2011). More typical summer/fall releases from the reservoir can generate flows of between 20 and 50 m<sup>3</sup>/s and raise the levels at the gauging station to 3.0 to 3.5 m.

During the previous benthic invertebrate assessment in August 2016, water velocity measurements in the Souris River were obtained and ranged from 0.0 to 0.1 m/s at the near shore sampling locations and upstream area, in water depths ranging from 0.6 to 0.7 m.

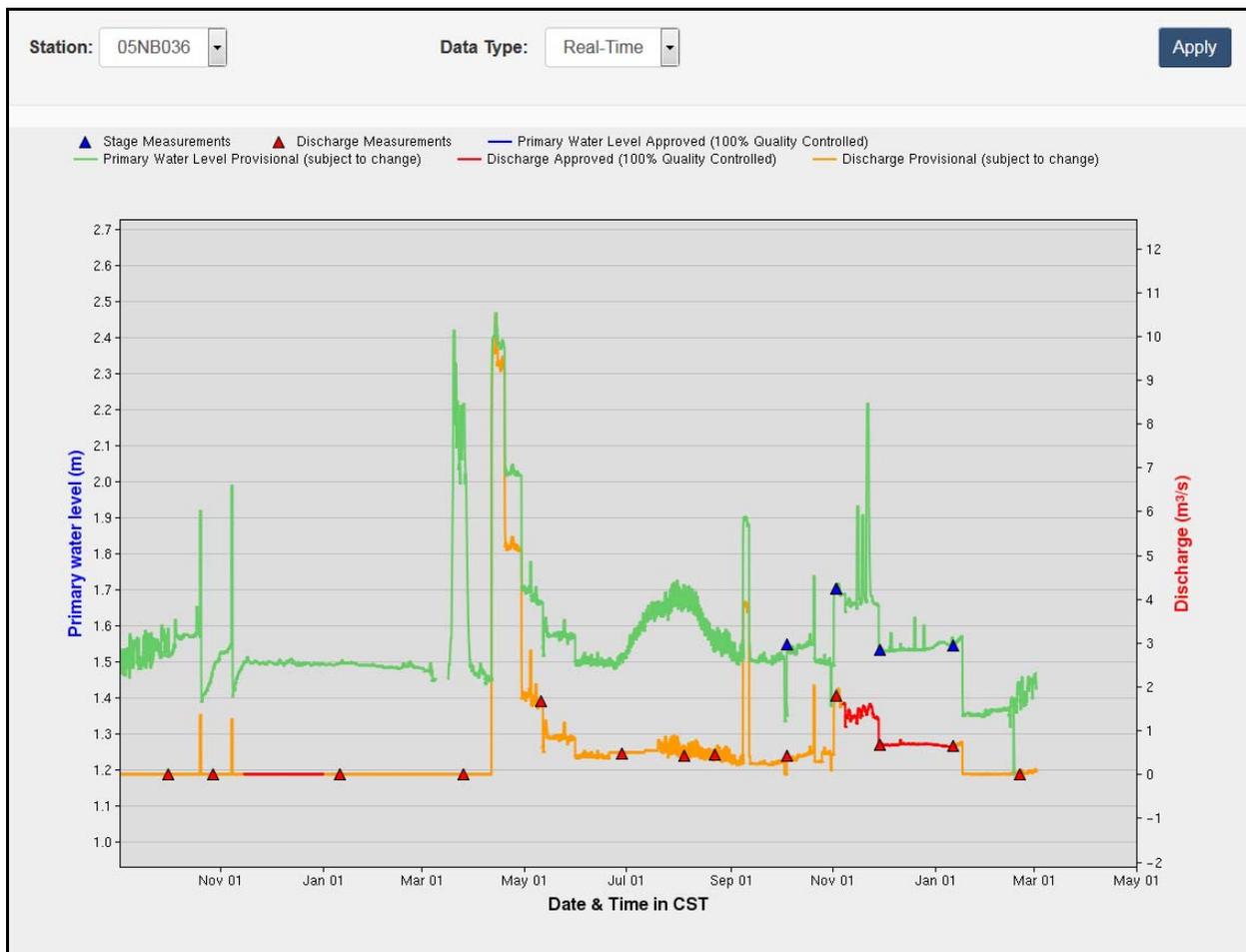


Plate 04: Hydrometric data graph (real time data) for the Souris River downstream of the Rafferty Reservoir, September 2016 to March 2018. Water level is shown in green and discharge is shown in orange.

Based on the cross-sectional surveys completed in January 2016, the winter ice level (January 2018) was established at 518.64 m. Summer water levels, as observed in August 2015, during the sediment sampling and in August 2016 during the benthic sampling, are estimated at approximately 518.6 m. The top of the timber cribbing on the rock-filled weir was surveyed at 518.74 m on the north side and 518.611 on the south side, and rose to 518.831 m near the north shoreline.

#### 4.1.6 Hydrogeology

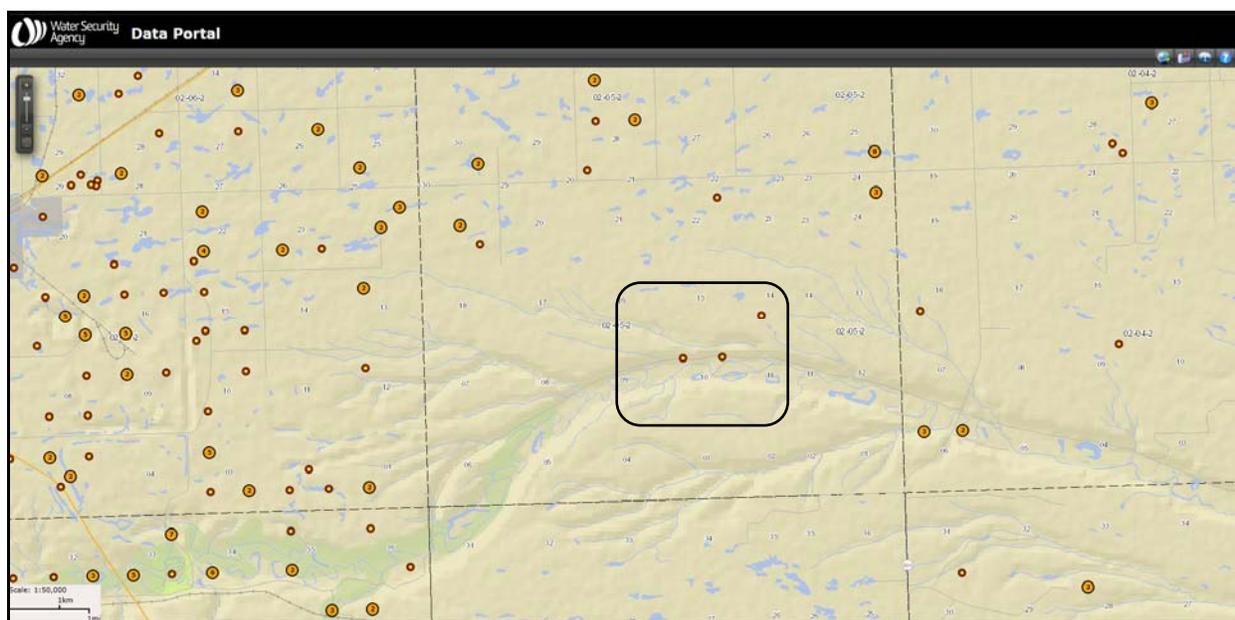
The principal source of water for domestic and livestock use are the shallow sand and gravel deposits associated with the glacial till, and the underlying shale bedrock. The groundwater flow direction in the area is

controlled by the local topography, which is generally towards the Souris River, which bisects the pasture in a west to east direction.

A previous search of groundwater well records, within a 1.6 km radius of the former operating yard, noted three wells located on the pasture property at NE 10-2-5 W2M, NW 10-2-5 W2M and SW 14-2-5 W2M, two of which are listed as domestic wells registered to PFRA Coalfields and PFRA Weyburn. The third well, registered to the Government of Canada, is listed as a research well. The locations of the three wells are highlighted on Plate 05 below.

The domestic wells, drilled in 1988 and 1971, were installed to depths of 12 and 32 m below grade, respectively. The piezometric level in the deeper well was reported to be 5 m below grade. There were no other groundwater wells listed within a 1.6 km radius of the operating yard.

As noted earlier, two groundwater monitoring wells, CF-04 and CF-33, were installed at the former rider's cabin area. The last monitoring data from August 20, 2015, indicated a groundwater depth of about 3.0 m below grade at CF-33, located just south of the former pump house and 3.7 m at CF-04, located to the northwest. The local groundwater elevation in August 2015 was 518.6 m at CF-33 and 519.1 m at CF-04. As noted from the winter ice level (high water level) of 520.2 m and summer water level of 518.6 m, there are expected to be periods of time when the groundwater and surface water interact at the site.



*Plate 05: Location of three wells within 1.6 km of the project site.*

## **4.2 BIOLOGICAL ENVIRONMENT**

### **4.2.1 Vegetation**

A vegetation assessment was conducted in 2016 based on the Government of Saskatchewan Detailed Site Assessment (DSA) requirements (2005). While these requirements are intended for the reclamation of oil and gas sites, the technical methods in the document provide a basis for assessing vegetation health against control sites and compliance with reclamation requirements for vegetation is an indication of a functioning ecosystem.

Since the site is disturbed and unreclaimed, two separate control areas were identified, one within the disturbed area affected by site activities but without PAH contamination, and one further away reflecting an undisturbed ecosystem expected to reflect the natural conditions in the area.

At the time of the assessment the Site was not reclaimed and concrete structures, a gravel/ dirt road and turnaround area remained in place. The vegetation onsite was overgrown and consisted of primarily noxious weeds. It is unknown if herbicide has ever been applied onsite in an attempt to control the noxious weeds as per

the *Saskatchewan Weed Act*. The vegetation, including the noxious weeds, was comparable to the vegetation adjacent to the impacted area; however, it was not comparable to the native prairie located north of the Site. The vegetation present within the impacted area was of good health with the exception of some apical chlorosis present on some of the Canada thistle plants.

The results of the DSA were inconclusive for potential impacts to vegetation since very few desirable species were present with a high density of noxious weeds.

Species noted in five quadrants within the project limits are summarized below.

Site	Plant		Bare Area	Weed		
	Species	Density		Species	Type	Density
1	Disturbed pasture. Poor litter development (<160 lbs/acre). Total vegetation cover is 90%. Dominant desirable species (>5% cover) include smooth brome, stinging nettle, prairie sage, western snowberry, green ash and Canada goldenrod.	25%	10%	Canada thistle, perennial sow thistle and common burdock. Some apical chlorosis on Canada thistle leaves.	Noxious	65%
2	Disturbed pasture. Poor litter development (<160 lb/acre). Total vegetation cover is 90%. Dominant desirable species (>5% cover) included stinging nettle, smooth brome, prairie sage, western snowberry, rose species, reed canary grass, and green ash.	65%	10%	Canada thistle and perennial sow thistle. Some apical chlorosis on Canada thistle leaves.	Noxious	25%
3	Disturbed pasture. Poor litter development (<160 lbs/acre). Total vegetation cover is 90%. Dominant desirable species (>5% cover) include stinging nettle, prairie sage, smooth brome, Canada goldenrod, green ash, and reed canary grass.	75%	10%	Canada thistle and perennial sow thistle. Some apical chlorosis on Canada thistle leaves.	Noxious	15%
4	Disturbed pasture. Poor litter development (<160 lbs/acre). Total vegetation cover is 90%. Dominant desirable species (>5% cover) include stinging nettle, smooth brome, reed canary grass, green ash, and Canada goldenrod.	65%	10%	Canada thistle and perennial sow thistle. Some apical chlorosis on Canada thistle leaves.	Noxious	25%
5	Disturbed pasture. Poor litter development (<160 lbs/acre). Total vegetation cover is 90%. Dominant desirable species (>5% cover) include stinging nettle, reed canary grass, Canada goldenrod, prairie sage, and green ash.	75%	10%	Canada thistle, perennial sow thistle and common burdock. Some apical chlorosis on Canada thistle leaves.	Noxious	15%

The adjacent disturbed pasture area outside the project limits generally consisted of smooth brome, prairie sage, Kentucky bluegrass and slender wheatgrass. Noxious weeds included Canada thistle, perennial sow thistle and common burdock. The adjacent native pasture areas used for grazing consisted of porcupine grass, side oats grama grass, Kentucky bluegrass, common snowberry, silverberry, needle and thread grass and little bluestem grass along with the weed species Meadow goat's beard.

#### 4.2.2 Wildlife

The project site is located within the Souris River valley. The valley provides terrestrial wildlife habitat for White-tailed deer, Ring-necked pheasant, Sharp-tailed grouse, Beaver, Western painted turtle and Snapping turtle (Saskatchewan Conservation Data Centre). The project site is a combination of disturbed prairie and noxious weeds, with a small ash tree. The project site provides limited habitat for wildlife use. More heavily treed areas

that likely provide improved wildlife habitat are present on the south shore of the Souris River and at locations further east and west of the project site on the north shore of the river.

The potential for terrestrial wildlife in the project area was previously assessed with respect to Burrowing Owl habitat. Burrowing Owl habitat consists of short vegetation with mammal burrows. The current project site does not appear suitable for Burrowing Owl habitat, based on the tall vegetation currently present. Additional review of potential species at risk within a 1.0 km radius of the project site is provided in Section 4.2.4 below.

### 4.2.3 Aquatic Habitat

The Souris River in the area of the AAFC Coalfields CP, approximately 38 km east of the Rafferty Dam, is highly regulated through operation of the dam, but undergoes periodic flooding and spikes in discharge (as noted above). Based on an examination of Google Earth™ imagery, several historic oxbow channels exist adjacent to the active channel, particularly upstream between the site and the Rafferty Dam; however, off-channel and backwater habitats appear to be rare.

A number of apparent features along the channel create a step/pool/run morphology and may create impediments to fish passage along the reach between the site and the Rafferty Dam. Based on the sandy glaciofluvial soil in the river valley and meandering nature of the channel, frequent scour pools likely exist at outside bends and bottom sediments are likely dominated by sands, with coarser substrata in the shallower areas and fine sediments above impounding features, including the rock filled weir immediately downstream of the project site.

The existing site, at the head of a fixed-crest rock filled weir, is a deep-pool, depositional area, with low water velocities. At the estimated normal summer water level and HWL described above, maximum (mid-channel) water depths are approximately 1.9 and 3.6 m, respectively.

The riverbed sediments at the site, in the depositional area above the rock filled weir, are soft (loosely compacted) fine sands and clay, overlying a firmer fine sandy clay.

Sampling for benthic invertebrates was previously conducted at the site on August 3 and 4, 2016 to support an Ecological Risk Assessment (ERA) for the project. Benthic invertebrates existed in moderately low densities, with little diversity at the project site (in contaminated sediments) and at an upstream reference site. Dominant taxa were midges (*Procladius*), worms (*Tubificinae*) and fingernail clams (mussels of the Family Pisidiidae, *Pisidium sp.* and *Sphaerium sp.*).

Based on observations during sediment sampling at the site, including that conducted in August 2016, as part of the benthic invertebrate assessment, the benthic habitat at the site does not support vegetation. Dissolved oxygen was near saturation and did not vary widely between measurements made in the morning and in the mid-afternoon, indicating that primary productivity was low in that area of the river.

The lack of aquatic vegetation at the site is likely due to minimal light penetration through the water column, as the water was noted as being brown and turbid. The area of sediment immediately adjacent to the soil remediation area has particularly low potential for supporting vegetation due to the depth of water, just upstream of the rock filled weir.

Water temperatures exceeding 25°C were recorded during the sampling in early August 2016 on a day when the ambient temperature was 37°C, which suggests that mid-summer temperatures may present a limitation to the habitat productivity for sensitive invertebrates, some cool-water fish species such as Walleye (*Sander vitreus*) and vegetation such as *Cladophora sp.*

Dominant riverbank vegetation at the site consists of Reed Canary Grass (*Phalaris arundinacea*), rush (*Juncaceae*), and sedge (*Cyperaceae*) species and Perennial Sow Thistle (*Sonchus arvensis*). A Green Ash (*Fraxinus pennsylvanica*) tree was also noted at the top of the riverbank within the area to be remediated.

Based on records for Long Creek just upstream of its confluence with the Souris River, fish species believed to inhabit the Souris River in Saskatchewan include Brook Stickleback (*Culaea inconstans*), Fathead Minnow (*Pimephales promelas*), White Sucker (*Catostomus commersoni*), and Yellow Perch (*Perca flavescens*). Walleye were stocked in the river in the 1940s and 1990s. Based on a review of the Saskatchewan HabiSask database

and personal communication (Tanya Johnson, Supervisor, Aquatic Habitat Protection Specialist, Saskatchewan Water Security Agency), there are no aquatic Species at Risk believed to inhabit the Souris River in Saskatchewan.

The local fish community is likely resident in the river mainstem, as the river does not connect to significant lakes or off-channel habitats near the AAFC Coalfields CP. Short Creek is an intermittent creek that flows into the Souris River from the south, upstream of the site, and likely provides seasonal habitat that is similar to that of the river. Extensive fish migration is likely prevented by seasonal and/or permanent barriers to fish passage along the Souris River channel, including the rock filled weir immediately downstream of the AAFC Coalfields CP site. Therefore, the entire life cycles of the local fish community are supported in local habitats in the river mainstem and floodplain areas.

The Souris River at the project site provides deep pool habitat that is likely utilized for overwintering and during low-flow, hot conditions. The fine sediments, low benthic productivity and lack of vegetation at the project site limit its value as rearing or feeding habitat. The rock filled weir represents a distinctive feature responsible for the water depth in that portion of the Souris River; however, other similar features, apparent on Google Earth™ imagery, likely create similar habitats. Other deep habitats are likely common along the river in scour pools at the outside bends, considering the erodible nature of the sandy soil that comprise the riverbanks.

Overall, the fish habitat at the site represents important, but not critical, fish habitat that is common in the area and not limiting to the productivity of the fishery. Its value as fish habitat is based upon its greater depth relative to other areas in the river.

#### 4.2.4 Species at Risk

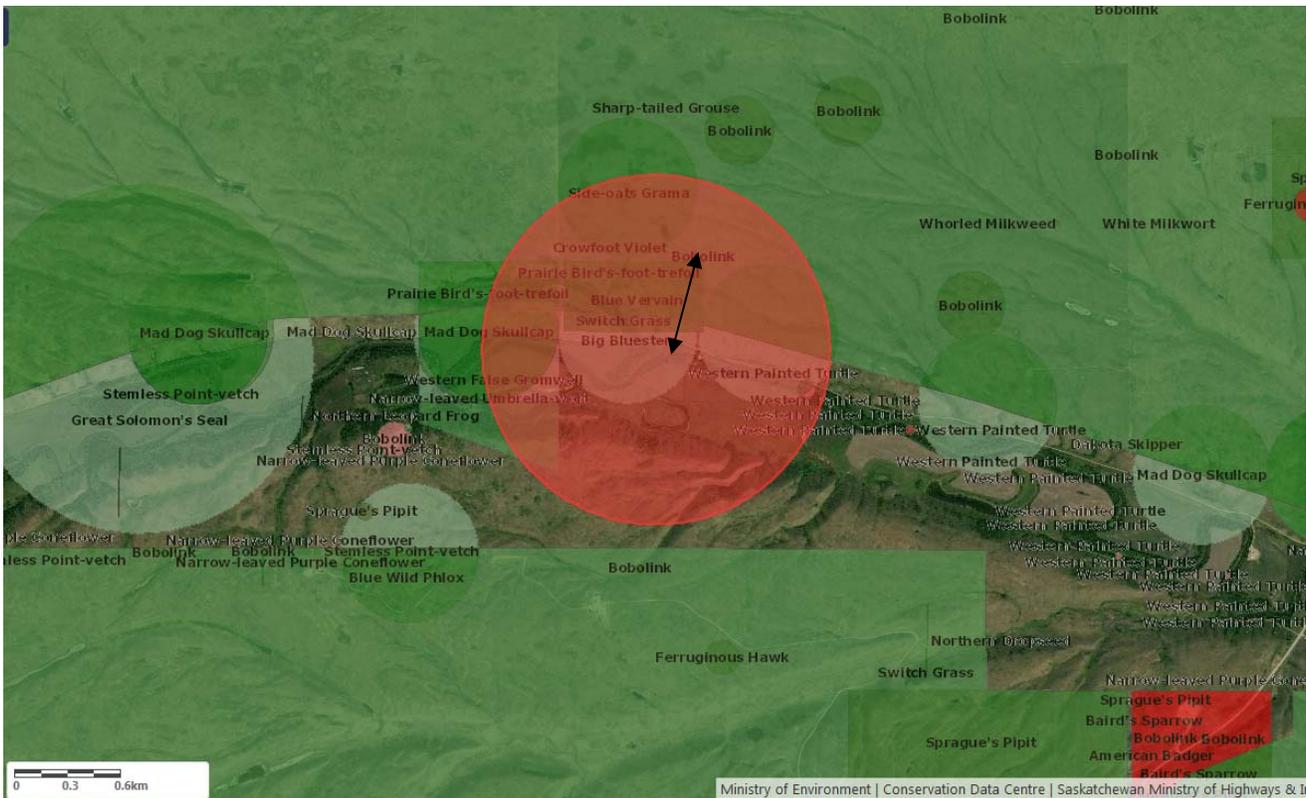
A search of rare, endangered and threatened species was completed for a 1.0 km radius around the project site using the Saskatchewan Conservation Data Centre (SK CDC) HABISask tool. One species was identified within the project limits and 13 species were identified within a 1.0 km radius of the project site, including eleven vascular plants and two vertebrate animals. The species report is provided as an Appendix and summarized in the table below.

A search of the federal Species at Risk Public Registry was completed to determine if any provincially listed species were protected under the Species at Risk Act (SARA). The Bobolink, a medium-sized passerine, is listed in Schedule 1 of SARA as threatened. This species has been observed within a 1.0 km radius of the project site.

Species	Class	COSEWIC Status	SARA Status	Provincial Rank	Global Rank
<b>Species Potential Within Project Limits</b>					
Big Bluestem ( <i>Andropogon gerardii</i> )	Vascular plant	N/A	N/A	S4 - Apparently secure	G5 - Secure
<b>Species Potential Within 1.0 km of Project Limits</b>					
Whorled Milkweed ( <i>Asclepias verticillata</i> )	Vascular plant	N/A	N/A	S1 - Critically imperiled/ Extremely rare	G5 - Secure
Blue Vervain ( <i>Verbena hastata</i> )	Vascular plant	N/A	N/A	S2 - Imperiled/ Very rare	G5 - Secure
Prairie Bird's-foot-trefoil ( <i>Lotus unifoliolatus</i> var. <i>unifoliolatus</i> )	Vascular plant	N/A	N/A	S2 - Imperiled/ Very rare	G5T5 - Secure
Switch Grass ( <i>Panicum virgatum</i> var. <i>virgatum</i> )	Vascular plant	N/A	N/A	S2 - Imperiled/ Very rare	G5T5 - Secure
Western False Gromwell ( <i>Onosmodium molle</i> var. <i>occidentale</i> )	Vascular plant	N/A	N/A	S2 - Imperiled/ Very rare	G4G5T4? - Apparently secure to secure
Crowfoot Violet ( <i>Viola pedatifida</i> )	Vascular plant	N/A	N/A	S3 - Vulnerable/ Rare to uncommon	G5 - Secure

Species	Class	COSEWIC Status	SARA Status	Provincial Rank	Global Rank
Mad Dog Skullcap ( <i>Scutellaria lateriflora</i> )	Vascular plant	N/A	N/A	S3 - Vulnerable/ Rare to uncommon	G5 - Secure
Narrow-leaved Purple Coneflower ( <i>Echinacea angustifolia</i> var. <i>angustifolia</i> )	Vascular plant	N/A	N/A	S3 - Vulnerable/ Rare to uncommon	G4T4 - Apparently secure
Narrow-leaved Umbrella-wort ( <i>Mirabilis linearis</i> )	Vascular plant	N/A	N/A	S3 - Vulnerable/ Rare to uncommon	G5 - Secure
Side-oats Grama ( <i>Bouteloua curtipendula</i> var. <i>curtipendula</i> )	Vascular plant	N/A	N/A	S3 - Vulnerable/ Rare to uncommon	G5T5 Secure
White Milkwort ( <i>Polygala alba</i> )	Vascular plant	N/A	N/A	S3 - Vulnerable/ Rare to uncommon	G5 - Secure
<b>Bobolink (<i>Dolichonyx oryzivorus</i>)</b>	<b>Vertebrate animal - bird</b>	<b>Threatened</b>	<b>Threatened Schedule 1</b>	<b>S4B, S4M - Apparently secure</b>	<b>G5 - Secure</b>
Western Painted Turtle ( <i>Chrysemys picta bellii</i> )	Vertebrate animal - reptile	Not at risk	N/A	S3 - Vulnerable/ Rare to uncommon	G5T5 - Secure

The observed location of the Schedule 1 SARA species (Bobolink) is shown below and was located 605 m north-northeast of the project site.



Saskatchewan CDC database location for reported Bobolink observation in relation to the project site located at the centre of the red circle.

In Saskatchewan, conservation activities are focused on taxa that have a rank of S1, S2 or S3, and avoidance or mitigation is required for these taxa during any development projects. Taxa with a rank including S3 or less are tracked by the SK CDC and locations of conservation significance are mapped. Taxa that are not ranked S1, S2 or S3 may still be tracked if special circumstances warrant.

None of the vascular plant species listed above were observed at the project site or at the disturbed control locations located directly adjacent to the project site during the vegetation survey completed in 2016. At the native pasture control sites located further from the project site, the vegetation survey noted the presence of Side-oats grama grass which has a provincial S3 rank. None of the native pasture control locations will be affected by the project.

The potential for terrestrial Species at Risk in the project area was also previously assessed with respect to Burrowing Owl habitat. Burrowing Owl habitat consists of short vegetation with mammal burrows. The current project site does not appear suitable for Burrowing Owl habitat, based on the tall vegetation currently present.

### **4.3 HUMAN ENVIRONMENT**

The project site is located in a rural agricultural area. The nearest large urban centre is Estevan, Saskatchewan, located approximately 30 km to the west of the project site. A number of small rural communities are also located in the area, including: Hirsch (7 km to the north); Frobisher (15 km to the northeast); Bienfait (17 km to the northwest); Roche Percee (17 km to the southwest); and Coalfields (11.5 km to the west). The Canada-United States border is located 12.5 km south of the project site at the North Portal crossing (Provincial Highway 39). Rural residences are located to the east of the project site along the north shore of the Souris River.

Land use in the area is primarily agricultural (crops and pasture) with a large area of coal extraction located to the west of the site. Oil and gas development is also prevalent in the area with a number of lease sites located within the AAFC Coalfields Community Pasture.

The project site is located in the Rural Municipality (RM) of Coalfields No. 4. The federal 2016 census profile indicates the RM of Coalfields No. 4 has a population of 368, down 3.7% from 382 in 2011. The RM had 183 private dwellings, with 148 occupied by usual residents. The population density per square kilometer is 0.4 over the total land area of 819.52 km<sup>2</sup>. The median total income among recipients (2015) was \$50,048 and 81.7% age 15 and older reported employment income.

The project site falls within the Treaty 2 area, which is primarily located in southwestern Manitoba and includes only a small area of the southeastern Saskatchewan as far west as Estevan. The Treaty 2 First Nations are all Manitoba First Nations and include:

- Dauphin River First Nation;
- Ebb and Flow First Nation;
- Keeseekoowenin Ojibway First Nation;
- Lake Manitoba First Nation;
- Lake St. Martin First Nation;
- Little Saskatchewan First Nation;
- O-Chi-Chak-Ko-Sipi First Nation (Crane River);
- Pinaymootang First Nation (Fairford); and
- Skownan First Nation (formerly Waterhen First Nation).

None of the 70 Saskatchewan First Nations have signed Treaty 2; however, there are four non-treaty First Nations present in Saskatchewan.

## 5.0 CONSULTATION

### 5.1 CONSULTATION WITH PROVINCIAL/TERRITORIAL AND/OR FEDERAL AUTHORITY

Department/Agency/Individual Correspondence:	Details and Response Received:	Date (yyyy/mm/dd)
Fisheries and Oceans Canada	Request for a project review submitted and evaluated by a Fisheries Protection Biologist. No authorization for project required under Fisheries Act.	April 2018
Transport Canada - Navigation Protection Program	Consulted to determine if Navigation Protection Act authorization required. Project involves no work in the Souris River and no authorization required.	April 2018
Saskatchewan Water Security Agency - Aquatic Habitat Protection	Aquatic Habitat Protection Permit application submitted, evaluated and permit for work received. The permit requires that a Conservation Officer from the Ministry of Environment (Estevan Office) shall be contacted prior to undertaking the work.	April 2018
Saskatchewan Water Security Agency - Hydrology and Groundwater Services	Manager of Flow Forecasting and Operations contacted and requested notification one month prior to project start and again immediately prior to project start.	March 2017
Saskatchewan Ministry of Environment	Corrective Action Plan submitted for information	April 2018
SaskPower	Manager of Dam Safety contacted and will be provided advance notification of project start date.	March 2017
Crown-Indigenous Relations and Northern Affairs Canada	Consulted to verify ATRIS findings, confirm that the assessment of no adverse impacts to Treaty or Metis rights is valid and review Duty to Consult obligation.	July 2018

### 5.2 PUBLIC PARTICIPATION

There are no known contentious issues associated with the project. The project will include the beneficial remediation of contaminated soil to facilitate property divestiture by AAFC. Public consultation was not implemented during the project development.

### 5.3 CONSULTATION WITH ABORIGINAL COMMUNITIES

As noted in Section 4.3, the project is located on Treaty 2 land. The nine First Nations that have signed Treaty 2 are located in Manitoba. The nearest Saskatchewan First Nations to the project site include: Ocean Man First Nation (Treaty 4); Pheasant Rump Nakota First Nation (Treaty 4); and White Bear First Nation (Treaty 4). These three First Nations are located north-northwest of Carlyle, Saskatchewan, which is approximately 60 km from the project site.

Since the project will include the beneficial remediation of the contaminated soil to facilitate property divestiture by AAFC, with no expected residual environmental impacts, it is not expected that there will any effects on the above Aboriginal groups and treaty rights. However, Aboriginal consultation has not been completed as part of the project development.

PSPC notes that there was an assertion of a Comprehensive Land Claim that encompasses the project area (Manitoba Dakota Sioux, 1991); however, the claim was not accepted for negotiations following a review by the Government of Canada, since it was found that the Dakota did not have the basis of a comprehensive claim. In January 2000, the Dakota Tipi First Nation made a public statement to the Minister of Indian Affairs asserting that the Dakota Tipi First Nation had a comprehensive claim to extensive areas across southern Manitoba. The geographic region of the claim included areas of southern Manitoba and Saskatchewan bounded by the Red, Assiniboine, Souris, Qu'Appelle and South Saskatchewan rivers (source: ATRIS website).

As noted above, there are no known contentious issues associated with the project; however, Aboriginal consultation was not implemented during the project development. PSPC completed an ATRIS search that identified Treaty 2 (hunting) rights mentioned above, the assertion of a Comprehensive Land Claim (Dakota Sioux discussed above) and the assertion of Metis rights (harvesting) throughout the province of Saskatchewan. Based on the scope of work and the fact that the site where remediation will be occurring is considered occupied Crown Land, it is not anticipated that any treaty rights under Historic Treaty 2 (i.e. hunting) nor any Metis Rights (i.e. harvesting) would be negatively impacted by the project. For this reason, Aboriginal Consultation was not completed.

## 6.0 ENVIRONMENTAL EFFECTS AND MITIGATION

**TABLE 1: POTENTIAL PROJECT–ENVIRONMENT INTERACTION MATRIX**

Project Phase/Components	Physical Environment						Biological Environment							Human Env./Aboriginal people			Human Env./General				
	Air Quality	Climate	Noise	Soil	Groundwater Quality	Surface Water Quality	Fish and Fish Habitat	Aquatic Species at Risk	Migratory Birds	Wetland	Vegetation	Wildlife	Species at Risk (non-aquatic)	Health and socio-economic conditions	Physical and Cultural Heritage	Current use of lands and resource for traditional purpose	Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance	Health and socio-economic conditions	Physical and Cultural Heritage	Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance	
<b>Construction:</b>																					
Site preparation, staging, laydown areas	X	X	X	X	X	X	X		X		X	X	X					X			
Vegetation/topsoil removal	X	X	X	X	X	X	X		X		X	X	X					X	X	X	
Demolition	X	X	X	X	X	X	X		X		X	X	X					X	X	X	
Excavation of impacted soil	X	X	X	X	X	X	X		X		X	X	X					X	X	X	
Transportation and disposal or impacted soil	X	X	X	X	X	X	X		X		X	X	X					X			
Backfilling and compaction	X	X	X	X	X	X	X		X		X	X	X					X			
Site restoration and seeding	X	X	X	X	X	X	X		X		X	X	X					X			
<b>Operation:</b>																					
Not applicable																					
<b>Modification:</b>																					
Not applicable																					
<b>Decommissioning</b>																					
Not applicable																					
<b>Accident/Malfunctions:</b>																					
Fires, Spills, Transportation Accidents	X	X	X	X	X	X	X		X		X	X	X					X			

## **6.1 PHYSICAL ENVIRONMENT**

The potential for impacts to the physical environment include air quality, climate, noise, soil, groundwater quality and surface water quality.

### **6.1.1 Air Quality**

There is a potential for air quality impacts during construction from dust raised by construction equipment and gaseous and particulate emissions from this equipment. It is expected that there will be less than five (5) emission sources (construction vehicles and equipment) operating at any one time at the project site during construction of the project. Vehicle and equipment exhaust emissions are expected to result in a potentially minor decrease in air quality at the project site and the immediately surrounding project area and a negligible impact in the regional area. The potential effect at the project site/area is small and short-term, for the duration of the construction activities, during working hours.

Potential airborne dust and particulates during construction resulting from vehicle movement, earthworks and demolition activities has the potential to cause minor effects to air quality, human health and vegetation (from dust deposition). As with exhaust emissions, these potential effects are limited to the project site and immediate project area and are small and short-term.

Potential odorous emissions during construction relate to exposure of contaminated soil. The project site is located in a remote agricultural area and there are no nearby occupied dwellings within the project site or area. It is expected that odours generating from construction will be negligible.

The following mitigation measures are included to address potential air quality impacts from construction:

- Limit the height of material stockpiles and cover piles, as required;
- Limit the area of exposed soil and complete re-vegetation as soon as possible after exposure;
- Maintain all vehicles and air pollution control equipment in good working order;
- Use covers on trucks transporting soil for off-site disposal;
- Use water spraying on granular surfaces as required to reduce dust generation; and
- Keep vehicle idling to a minimum to reduce gaseous and particulate emissions.

As per the project specification, the Contractor is also required to submit an Environmental Protection Plan prior to site mobilization that includes an Air Pollution Control Plan.

Residual effects on project site air quality are expected during construction. The residual effects, after implementation of mitigation measures, are expected to be small in magnitude, limited to the project site and immediately surrounding project area, and short-term in duration (construction phase). As a result, no significant residual effects are anticipated.

### **6.1.2 Climate**

During construction, greenhouse gas (GHG) emissions consisting of carbon dioxide and nitrous oxides will be produced by combustion engines, including staff vehicles, construction vehicles and construction equipment. GHGs can contribute to long-term negative climate change effects. It is difficult to measure climate change effectively on a small scale such as the project site/project area, therefore, the GHG emissions from the project are predicted relative to the generation of GHGs in Saskatchewan (regional area and beyond).

It is estimated that less than 10 total pieces of combustion-fired equipment will be in use at the site at any one time during construction, including those transporting the contaminated soil. Although the total GHG emissions from these vehicles has not been defined, based on the number of pieces of equipment, the amount of GHGs emitted is expected to be negligible in comparison to the amount of GHGs emitted in the province as a whole. Data from 2015 indicate that Saskatchewan GHG emissions totalled 75 million tonnes of CO<sub>2</sub> equivalents (Canada Natural Inventory Report 1990-2015, dated 2017). At the project site, GHGs would be produced over the short-term (during construction) and continuously during working hours. The generation of GHGs from construction equipment is expected to negligibly contribute to long-term negative climate change effects.

Although GHG emissions are considered to be negligible in the context of provincial emissions, the following mitigation measures are recommended to reduce the overall carbon footprint of the project:

- Properly maintain vehicles and equipment used at the project site; and
- Keep vehicle and equipment idling to a minimum.

As per the project specification, the Contractor is also required to submit an Environmental Protection Plan prior to site mobilization that includes an Air Pollution Control Plan.

The amount of GHGs emitted during construction is expected to be negligible in comparison to the GHGs emitted by the province as a whole. As a result, potential residual effects are not expected.

### **6.1.3 Noise**

Noise will be generated to varying degrees during construction and is associated with heavy truck traffic used to transport materials to/from the site, operation of equipment used for construction activities and related traffic associated with construction. The potential effect at the project site and immediately surrounding project area is expected to be small and short-term, for the duration of the construction activities, during working hours.

The following mitigation measures are included to address potential impacted related to noise:

- Keep vehicle idling to a minimum to reduce noise emissions;
- Maintain vehicles in good working order and ensure all noise dampening equipment is installed and operational; and
- Provide hearing protection for workers and post clear signage in all areas of the project site that require hearing protection to be worn.

Residual effects related to noise are expected during construction. The residual effects, after implementation of mitigation measures, are expected to be small in magnitude, limited to the project site and immediately surrounding project area, and short-term in duration (construction phase). As a result, no significant residual effects are anticipated.

### **6.1.4 Soil**

Site preparation works, including clearing and grading, will result in removal and changes to soil including possible loss due to erosion, mixing and compaction, and potential contamination as a result of accidents.

Conditions favourable to soil erosion can occur during clearing and grubbing, excavation work, stockpiling and equipment movement on-site. The project will disturb a small area of 670 m<sup>2</sup> plus an additional unquantified area for staging and laydown. Erosion of soil and material stockpiles due to wind can cause subsequent effects on air quality (dust and particulate matter), while erosion due to precipitation and runoff can cause subsequent effects on surface water quality and potentially on downstream fish habitat. Based on the existing site conditions, which include sandy soil, erosion has the potential to occur at the project site, with potential effects observed in the surrounding project area.

Soil compaction can occur from construction vehicle movement and placement of materials and stockpiles. Large changes in soil compaction can also subsequently change surface drainage patterns and affect vegetation growth. Based on the site-specific coarse soil conditions and disturbed nature of the site, there are negligible effects from the project construction on soil compaction.

Soil contamination can occur from fluid leaks on construction equipment, improper disposal of cleaning rags, used oil, solid waste and wastewater from portable sanitary facilities. Given the coarse grained soil texture at the project site, potential spills of hazardous materials can migrate both vertically and horizontally through the soil away from the project site.

Mitigation measures to reduce potential project effects on soil quality include:

- Contractor shall prepare an erosion and sedimentation control plan for the project outlining practices that should be adopted during construction and decommissioning;
- A Spill Response Plan will be prepared by the Contractor to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur;
- Stockpile topsoil and other organic soils separately for reuse;
- Limit material stockpile heights and cover, if required;
- Locate material stockpiles away from drainage areas;
- Keep disturbed/exposed areas to a minimum and re-vegetate as soon as practical, where required;
- Limit vehicle and equipment movement to access pathways within and around the work areas;
- Properly store all waste materials and remove from the site promptly;
- Do not store fuel or oil products on site unless at least 100 m away from a drainage feature or surface water body and contained within spill-proof enclosures;
- Maintain spill clean-up equipment on-site during construction activities; and
- Conduct regular inspection of all hazardous material storage containers for evidence of leaks.

With the implementation of applicable mitigation measures and engineering design standards, the potential residual effects to soil are anticipated to be small in magnitude, limited to the project site and area and short-term in duration (construction phase). As a result, no significant residual effects are anticipated.

### **6.1.5 Groundwater Quality**

Groundwater quality has the potential to be affected by the release of contaminants from accidental spills and improper storage and disposal of waste generated at the site.

Mitigation measures to reduce potential project effects on groundwater quality include:

- Storage and handling of all potential contaminants and/or hazardous materials should be in accordance with established guidelines and regulations, including all federal and provincial standards and protocols; and
- A Spill Response Plan will be prepared by the Contractor to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur.

With the implementation of the above-noted mitigation measure, the potential for a release is anticipated to be low. As a result, significant residual effects to groundwater are not anticipated.

### **6.1.6 Surface Water Quality**

The Souris River is located at the project site. Construction activities have the potential to affect surface water quality through sedimentation and spills of contaminants such as fuels, chemicals and wastewater. Wind and precipitation and/or runoff could cause soil erosion during construction activities, including clearing and grubbing, excavation work, stockpiling materials and equipment/vehicle movement. Soil erosion can cause subsequent effects to surface water quality downstream of the project site (and also aquatic resources) in the immediately surrounding project area as a result of sediment accumulation and turbidity.

Surface water quality has the potential to be affected by the release of contaminants from accidental spills, and improper storage and disposal of waste generated at the site. The potential negative effects of an accidental release are expected to be moderate, short-term and would extend from the project site to the immediately surrounding project area.

Mitigation measures to reduce potential project effects on surface water quality include:

- The mitigation measures noted above for soil quality (erosion) also mitigate effects on total suspended solids;
- Storage and handling of all potential contaminants and/or hazardous materials shall be in accordance with established guidelines and regulations, including all federal and provincial standards and protocols;

- Refuelling and equipment maintenance activities shall occur at least 100 m away from a water body and conducted in a manner designed to prevent the release of a deleterious substance into a water body;
- A Spill Response Plan will be prepared by the Contractor to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur;
- Installation of silt fencing around the perimeter of the excavation area; and
- Construction of drainage swales are required to divert runoff.

With the implementation of the above-noted mitigation measure, the potential for sedimentation from soil erosion or a release of fuels or chemicals is anticipated to be low. As a result, significant residual effects to surface water are not anticipated.

An erosion and sediment control monitoring program will be carried out and will focus on all measures employed or needed to prevent erosion on site and migration of eroded soil off-site or into the Souris River. The erosion and sediment control monitoring program will entail the following, in addition to monitoring and recording of general site conditions:

- The Departmental Representative will twice daily conduct a visual inspection of all upland and riverbank erosion and sediment control works; and
- The Contractor will modify and repair all works that are not functioning adequately, under the direction of the Departmental Representative.

## **6.2 BIOLOGICAL ENVIRONMENT**

### **6.2.1 Terrestrial Environment - Vegetation and Species at Risk**

The project will include the removal of existing vegetation from the area to be excavated; however, this vegetation is already disturbed by human activity and contains a large percentage of noxious weeds. There is one small green ash tree located within the project site that will require removal. No vegetation species listed in the SARA were present at the project site; however, provincially listed species are present in the surrounding project area (within 1.0 km of the site). The vascular plant with the greatest potential to be located in an area disturbed by the project is Big bluestem, which has a provincial rank of S4 (apparently secure).

Accidental releases of fuel, chemicals or hazardous substances could impact vegetation on the project site and the surrounding project area. This impact is expected to be small in nature, limited to the project site and immediately surrounding project area, and short-term.

Mitigation measures to reduce the potential project effects on vegetation include:

- Limit vehicle and equipment movements to designated areas to avoid damaging vegetation;
- Minimize surface disturbances and complete re-vegetation as soon as practicable;
- Should Big bluestem be located in an area to be disturbed by the project, the PSPC Project Manager (working on behalf of AAFC) shall be notified immediately, and all efforts to avoid impacts to this provincially listed SAR shall be undertaken; and
- A Spill Response Plan will be prepared by the Contractor to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur.

With the implementation of the above-noted mitigation measure, the potential for stress and/or damage to vegetation is anticipated to be low. As a result, significant residual effects to vegetation are not anticipated.

### **6.2.2 Terrestrial Environment - Wildlife and Species at Risk**

Wildlife that are transient in the area (birds, insects, small mammals) are expected to be disturbed by construction activities and may temporarily avoid the project site during the construction period. Similar and improved habitat is available in the Souris River valley on both the north and south shorelines near the project site and it is expected that wildlife will relocate to these areas. The Western painted turtle has been observed

along the Souris River both upstream and downstream of the project site. This species is not listed in the SARA but has a provincial rank of S3 (vulnerable, rare to uncommon).

No species listed in the SARA are known to be present at the project site; however, the Bobolink, a Schedule 1 SARA listed species, has been observed about 605 m north-northeast of the project location. The Bobolink nests in forage crops (hay fields and pastures dominated by a variety of species) and can also utilize grassland habitats such as wet prairie, graminoid peatlands and abandoned fields dominated by tall grasses. The nests are always built on the ground. It is not anticipated that this Species at Risk will be disturbed by project activities, as the project site does not represent suitable habitat for this species.

Mitigation measures to reduce the potential project effects on wildlife include:

- Vegetation (tree, grass) and ground cover will be checked for nests and clearing activities will be prohibited during critical nesting periods (April 1 to July 31); and
- Should a Western painted turtle be located in an area to be disturbed by the project, the PSPC Project Manager (working on behalf of AAFC) shall be notified immediately, and all efforts to avoid impacts to this provincially listed SAR shall be undertaken; and
- A Spill Response Plan will be prepared by the Contractor to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur.

With the implementation of the above-noted mitigation measure, effects on wildlife are anticipated to be negligible. As a result, significant residual effects to wildlife are not anticipated.

### **6.2.3 Aquatic Environment - Fish and Fish Habitat and Species at Risk**

During construction, increases in surface water runoff could occur and cause negative effects on fish and fish habitat through increased sedimentation and the introduction of potential contaminants and harmful substances to the Souris River. The potential effect of increased surface runoff and/or sedimentation on fish and fish habitat is expected to be small, limited to the immediately surrounding project area, and short-term in duration. The mitigation measures proposed to protect surface water quality are also sufficient to protect the aquatic resources near the project site.

Similarly, the potential for impacts to surface water, and subsequently, fish and fish habitat, was identified due to the release of potentially harmful substances such as fuels, chemicals, wastewater or other hazardous substances. The potential effect is expected to be small, limited to the immediately surrounding project area and short-term in duration.

Overall, the project is expected to have a net positive effect on the aquatic environment through removal of a potential contaminant source from the project site. This is expected to produce a long-term improvement in the sediment quality in the Souris River and downstream of the project site.

The mitigation measures described to avoid/minimize project effects on water quality are applicable to fish and fish habitat.

With the implementation of the mitigation measures noted in Section 6.1.6 (Surface Water Quality), effects on fish and fish habitat are anticipated to be negligible. As a result, significant residual effects to fish and fish habitat are not anticipated.

### **6.2.4 Migratory Birds**

Given the project timing in late fall (September - October), the potential for interaction with nesting migratory birds is considered to be negligible as the construction period falls outside the general nesting period for southeastern Saskatchewan (mid-April to late August). Additionally, the project site vegetation consists of disturbed prairie and noxious weeds, with a small ash tree. Suitable nesting habitat for most migratory species is not present at the site and higher quality habitat is present in less disturbed riparian areas further from the site.

The project site will be screened during the on-site Pre-Tender Bidder's Meeting in late July 2018 and the presence of any nesting birds will be reported so that mitigation measures can be implemented as required.

The effect of the project on migratory birds is expected to be negligible. As a result, significant residual effects are not anticipated.

### **6.3 HUMAN ENVIRONMENT**

Given the project location in an agricultural setting that is remote from any populated areas or areas used by the public, there are no anticipated impacts to health and socio-economic factors. Additional details are provided below for specific human environment project interactions.

#### **6.3.1 Land and Resource Use**

During construction, there will be positive direct effects resulting from employment opportunities, and indirect positive effects related to a beneficial reuse of the project site (following completion of the environmental remediation). The land use at the project site is expected to remain agricultural and no effects are anticipated in this regard.

No effects were identified for land and resource use and no mitigation measures are proposed. Since no effects were identified for land and resource use resulting from the project, the residual effects are determined to be negligible.

#### **6.3.2 Transportation**

An increase in traffic on Provincial Highway 604 and the local road on the north side of the Souris River leading to the project site will likely be noticeable for the duration of the construction activities. It is unlikely that the increase in traffic will be noticeable on Provincial Highway 18. The impact is expected to be small, limited to the project site and surrounding project area, and short-term in nature (construction phase).

To address potential traffic issues during construction, the following mitigation measures are provided:

- In the event that local roads are damaged due to increased traffic during construction, the Contractor will complete the necessary repairs;
- The Rural Municipality of Coalfields No. 4 should be notified before construction starts and kept informed of traffic movement;
- All construction workers and drivers should be reminded of safe-driving habits and local speed limits and road weight restrictions;
- Transportation routes for equipment and material deliveries, and for contaminated soil removal should be developed that avoid residential neighbourhoods as much as possible; and
- Where traffic control is required on public roads, the Contractor will provide a flag person to direct traffic.

The increase in traffic during construction may cause potential effects that are expected to be small in magnitude, limited to the project area in geographic extent, and short-term in duration. As a result, no significant residual effects are anticipated.

#### **6.3.3 Heritage and Cultural Resources**

No heritage or cultural resources have been identified for the project site, and there are no disturbances anticipated for areas beyond the project site boundaries. There is the potential that heritage resources could be encountered during excavation at the project site since the site development has been traced back to the early 1913 with the construction of the pump house. The project location along a river also provides potential for heritage resources as a result of the traditional migration of peoples and Aboriginal groups who may have travelled on the river. The potential impacts would be small, limited to the project site and short-term in duration.

To mitigate the potential effects on heritage and cultural resources, the following mitigation measures will be implemented:

- If artifacts, historical features or human remains are encountered during construction, work activities will be stopped immediately at the area of the discovery and the find reported to the site supervisor and subsequently to the PSPC Project Manager;
- A qualified archaeologist may be required to investigate and assess the discovery prior to resuming work; and
- If human remains are discovered during construction activities, the find should be immediately reported to the site supervisor, the PSPC Project Manager and the RCMP.

## **6.4 MALFUNCTIONS AND ACCIDENTS**

The types of potential accidents and malfunctions that may occur during construction include fires and explosions, spills, equipment malfunctions, and transportation accidents. The effects of these accidents and malfunctions, proposed mitigation measures, and significance of residual effects, are discussed below.

To prevent accidents and malfunctions, the construction will be conducted in accordance with regulatory requirements. Additional precautionary measures are proposed below to mitigate accidents and malfunctions. Worker protection in Saskatchewan is provided through standards, procedures and training legislated under the Occupational Health and Safety Act. All activities at the project site should be carried out in accordance with the Occupational Health and Safety Act to minimize health and safety effects.

### **6.4.1 Fire**

During construction, fires and/or explosions may be possible as a result of propane heater use, welding/cutting, sparks during fuelling, equipment malfunctions, improper storage of hazardous materials, and other construction and demolition activities.

Potential effects related to fires and explosions include property loss, loss of life, loss of vegetation and wildlife habitat, and the release of hazardous materials into the environment.

Mitigation measures that will be implemented to reduce the potential for fires and explosions include:

- All flammable waste will be removed on a regular basis and disposed at an appropriate disposal site;
- Fire extinguisher(s) will be available on-site at all times during all phases of the project, and will comply with and be maintained to the manufacturer's standards;
- Greasy/oily rags or materials subject to spontaneous combustion will be deposited and stored in appropriate containers and removed from the site on a regular basis for disposal at an appropriate disposal site;
- All chemicals and fuel will be stored in appropriate facilities that have been designed and constructed in compliance with provincial legislation, codes and guidelines;
- Smoking will only be allowed in designated outdoor areas that contain appropriate receptacles for disposal of cigarette butts; and
- An emergency response plan will be developed prior to construction that includes fire and explosion prevention, notification protocols and safe muster areas.

### **6.4.2 Spills**

During construction, environmental effects resulting from fuel, chemical and wastewater spills are possible. The accidental release of these hazardous substances to the environment could affect air quality, soil, groundwater, vegetation, wildlife and fish, and fish habitat. In addition, an accidental release could cause a direct threat to human health and safety.

To prevent spills from occurring during the project construction, the following procedures will be employed:

- All potentially hazardous products required to be present on-site will be stored in a pre-designated, safe and secure product storage area(s) in accordance with applicable legislation;
- Storage sites will be inspected periodically for compliance with requirements;
- Any used oils or other hazardous liquids will be collected and disposed in compliance with provincial requirements;

- Vehicles and equipment will be maintained to minimize the potential for leaks. Regular inspection of hydraulic and fuel systems on equipment and machinery will be performed. When detected leaks will be repaired immediately by trained personnel;
- Refuelling and equipment maintenance will occur at least 100 m away from a waterbody or drainage feature leading to a waterbody, and will be conducted in a manner designed to prevent the release of a hazardous substance;
- Fuel transfers, including from tanker to storage tank and storage tank to equipment, will be attended and monitored at all times;
- Standard environmental management practices will be adhered to in order to minimize the risk of accidental spills and potential effects;
- An emergency spill response plan will be prepared and contain procedures for responding to a spill that include: reporting to the local, provincial and federal authorities as appropriate; taking immediate measures with a spill kit or other suitable alternative to prevent migration of the spill, implementing recovery measures in consultation with appropriate authorities; and undertaking remedial action to remove contaminated material;
- Training will be provided to on-site construction and operational staff to properly deploy spill response equipment and implement the spill response plan; and
- Spill response equipment will be available on-site at all times during all phases of the project.

The implementation of the above mitigation measures, in addition to the construction of the project in accordance with all applicable legislation and codes, is expected to result in residual effects that are considered small, limited to the project site and immediately surrounding area, and short-term in duration. As a result, no significant residual effects are anticipated.

#### **6.4.3 Transportation Accidents**

Transportation accidents can result in the accidental release of vehicle fluids such as diesel, oil and gasoline and the release of the material being transported, such as contaminated soil. The potential environmental effects from an accidental release during transportation would include air, soil, groundwater, surface water, vegetation, wildlife, fish and fish habitat, land and resource use and human health.

Mitigation measures related to traffic have been previously described and will mitigate the potential for accidents to the extent practicable. In the event of a transportation accident resulting in a spill, appropriate notification to the local, provincial and federal authorities will occur, and remediation measures will be coordinated, as required, and based on the nature of the spilled material.

After implementation of mitigation measures, the potential residual effects of a transportation accident are expected to be small, limited to the project site and project area, and short-term in duration. As a result, no significant residual effects are anticipated.

## 7.0 MITIGATION MEASURES AND SIGNIFICANCE OF RESIDUAL ENVIRONMENTAL EFFECTS

### 7.1 MITIGATION MEASURES

### 7.2 RESIDUAL EFFECTS

TABLE 2: PROJECT EFFECTS, MITIGATION AND SIGNIFICANCE OF RESIDUAL EFFECTS

Potential Effects	Characteristics and Magnitude <sup>1</sup> (before mitigation)							Mitigation Measures	Significance of Residual Effects
	Nature	Magnitude	Spatial Extent	Timing	Duration of Impacts	Reversibility	Likelihood		
<b>Physical Environment</b>									
Air Quality	N	L	L	C	S	R	L	<ul style="list-style-type: none"> <li>Limit the height of material stockpiles and cover piles, as required;</li> <li>Limit the area of exposed soil and complete re-vegetation as soon as possible after exposure;</li> <li>Maintain all vehicles and air pollution control equipment in good working order;</li> <li>Use covers on trucks transporting soil for off-site disposal;</li> <li>Use water spraying on granular surfaces as required to reduce dust generation;</li> <li>Keep vehicle idling to a minimum to reduce gaseous and particulate emissions; and</li> <li>Contractor is required to submit an Environmental Protection Plan prior to site mobilization that includes an Air Pollution Control Plan.</li> </ul>	Minimal
Climate	N	L	R	C	L	I	U	<ul style="list-style-type: none"> <li>Properly maintain vehicles and equipment used at the project site;</li> <li>Keep vehicle and equipment idling to a minimum; and</li> <li>Contractor is required to submit an Environmental Protection Plan prior to site mobilization that includes an Air Pollution Control Plan.</li> </ul>	Minimal
Noise	N	L	I	C	S	R	L	<ul style="list-style-type: none"> <li>Keep vehicle idling to a minimum to reduce noise emissions;</li> <li>Maintain vehicles in good working order and ensure all noise dampening equipment is installed and operational; and</li> </ul>	Minimal

<sup>1</sup> **Nature/Direction of Effect:** a Positive ('P') or Negative ('N') impact or direct ('D') or indirect ('I') effect (note there may still be a residual effect following mitigation, in which case the nature of the effect will be identified as being Negative – 'N', even though the net effect post-mitigation is better than it would otherwise be without mitigation);

**Magnitude:** the typical effects of the impact (Low – 'L'; Medium – 'M'; or High – 'H') on the environment/community;

**Spatial Extent:** the area or volume covered (Immediate – 'I'; Local – 'L'; or Regional – 'R');

**Timing:** Construction ('C'), Operation ('O') or Decommissioning ('D');

**Duration of Impacts:** Short-Term ('S'), Long-Term ('L'), Intermittent ('I') or Continuous ('C');

**Reversibility/Irreversibility:** a prediction of whether or not an effect, once it has been stopped, can return to its pre-existing situation (Reversible – 'R'; or Irreversible – 'I'); and

**Likelihood of Occurrence Without Mitigation:** a prediction of whether the effect is likely to occur if mitigation options are not implemented (Likely – 'L'; or Unlikely – 'U')

Potential Effects	Characteristics and Magnitude <sup>1</sup> (before mitigation)							Mitigation Measures	Significance of Residual Effects
	Nature	Magnitude	Spatial Extent	Timing	Duration of Impacts	Reversibility	Likelihood		
								<ul style="list-style-type: none"> <li>Provide hearing protection for workers and post clear signage in all areas of the plant that require hearing protection to be worn.</li> </ul>	(Minimal, Low, Moderate, High)
Soil	N	L	L	C	S	R	L	<ul style="list-style-type: none"> <li>Contractor shall prepare an Erosion and Sedimentation Control Plan for the project outlining practices that should be adopted during construction and decommissioning;</li> <li>Contractor shall prepare a Spill Response Plan to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur;</li> <li>Stockpile topsoil and other organic soils separately for reuse;</li> <li>Limit material stockpile heights and cover, if required;</li> <li>Locate material stockpiles away from drainage areas;</li> <li>Keep disturbed/exposed areas to a minimum and re-vegetate as soon as practical, where required;</li> <li>Limit vehicle and equipment movement to access pathways within and around the work areas;</li> <li>Properly store all waste materials and remove from the site promptly;</li> <li>Do not store fuel or oil products on site unless at least 100 m away from a drainage feature or surface water body and contained within spill-proof enclosures;</li> <li>Maintain spill clean-up equipment on-site during construction activities;</li> <li>Conduct regular inspection of all hazardous material storage containers for evidence of leaks; and</li> <li>Contractor to prepare a spill and emergency response plan.</li> </ul>	Minimal
Groundwater Quality	N	L	I	C	S	R	L	<ul style="list-style-type: none"> <li>Storage and handling of all potential contaminants and/or hazardous materials should be in accordance with established guidelines and regulations, including all federal and provincial standards and protocols; and</li> <li>Contractor shall prepare a Spill Response Plan to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur.</li> </ul>	Minimal
Surface Water Quality	N	L	L	C	S	R	L	<ul style="list-style-type: none"> <li>The mitigation measures noted above for soil quality (erosion) also mitigate effects on total suspended solids;</li> </ul>	Minimal

Potential Effects	Characteristics and Magnitude <sup>1</sup> (before mitigation)							Mitigation Measures	Significance of Residual Effects
	Nature	Magnitude	Spatial Extent	Timing	Duration of Impacts	Reversibility	Likelihood		
								<ul style="list-style-type: none"> <li>Storage and handling of all potential contaminants and/or hazardous materials shall be in accordance with established guidelines and regulations, including all federal and provincial standards and protocols;</li> <li>Refuelling and equipment maintenance activities shall occur at least 100 m away from a water body and conducted in a manner designed to prevent the release of a deleterious substance into a water body;</li> <li>Contractor shall prepare a Spill Response Plan to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur;</li> <li>Installation of silt fencing around the perimeter of the excavation area; and</li> <li>Construction of drainage swales are required to divert runoff.</li> </ul>	(Minimal, Low, Moderate, High)
<b>Biological Environment</b>									
Terrestrial Environment - Vegetation and Species at Risk	N	L	L	C	S	R	L	<ul style="list-style-type: none"> <li>Limit vehicle and equipment movements to designated areas to avoid damaging vegetation;</li> <li>Minimize surface disturbances and complete re-vegetation as soon as practicable;</li> <li>Should Big bluestem be located in an area to be disturbed by the project, the PSPC Project Manager (working on behalf of AAFC) shall be notified immediately, and all efforts to avoid impacts to this provincially listed SAR shall be undertaken; and</li> <li>Contractor shall prepare a Spill Response Plan to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur.</li> </ul>	Minimal
Terrestrial Environment - Wildlife and Species at Risk	N	L	L	C	S	R	L	<ul style="list-style-type: none"> <li>Vegetation (tree, grass) and ground cover will be checked for nests and clearing activities will be prohibited during critical nesting periods (April 1 to July 31); and</li> <li>Should the Western painted turtle be located in an area to be disturbed by the project, the PSPC Project Manager (working on behalf of AAFC) shall be notified immediately, and all efforts to avoid impacts to this provincially listed SAR shall be undertaken; and</li> <li>Contractor shall prepare a Spill Response Plan to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur.</li> </ul>	Minimal

Potential Effects	Characteristics and Magnitude <sup>1</sup> (before mitigation)							Mitigation Measures	Significance of Residual Effects
	Nature	Magnitude	Spatial Extent	Timing	Duration of Impacts	Reversibility	Likelihood		
Aquatic Environment - Fish and Fish Habitat and Species at Risk	N	L	L	C	S	R	L	<ul style="list-style-type: none"> <li>The mitigation measures noted above for soil quality (erosion) also mitigate effects on total suspended solids;</li> <li>Storage and handling of all potential contaminants and/or hazardous materials should be in accordance with established guidelines and regulations, including all federal and provincial standards and protocols;</li> <li>Refuelling and equipment maintenance activities should occur at least 100 m away from a water body and conducted in a manner designed to prevent the release of a deleterious substance into a water body;</li> <li>Emergency response plans, procedures and equipment to address the accidental release of fuel, chemicals or other hazardous materials, should be prepared to minimize the effects should an accidental release occur;</li> <li>Installation of silt fencing around the perimeter of the excavation area;</li> <li>Construction of drainage swales are required to divert runoff; and</li> <li>Contractor shall prepare a Spill Response Plan to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur.</li> </ul>	Minimal
Migratory Birds	N	L	I, L	C	S	R	L	<ul style="list-style-type: none"> <li>Vegetation (tree, grass) and ground cover will be checked for nests and clearing activities will be prohibited during critical nesting periods (April 1 to July 31); and</li> <li>Contractor shall prepare a Spill Response Plan to address the accidental release of fuel, chemicals or other hazardous materials which will minimize the effects should an accidental release occur.</li> </ul>	Minimal
<b>Human Environment</b>									
Land and Resource Use	P	L	I	C O	L	I	L	<ul style="list-style-type: none"> <li>No mitigation necessary - project has a positive effect through beneficial soil remediation</li> </ul>	Low positive
Transportation	N	S	L	C	S	R	L	<ul style="list-style-type: none"> <li>In the event that local roads are damaged due to increased traffic during construction, the Contractor will complete the necessary repairs;</li> <li>The Rural Municipality of Coalfields No. 4 should be notified before construction starts and kept informed of traffic movement;</li> <li>All construction workers and drivers should be reminded of safe-driving habits and local speed limits and road weight restrictions;</li> </ul>	Minimal

Potential Effects	Characteristics and Magnitude <sup>1</sup> (before mitigation)							Mitigation Measures	Significance of Residual Effects
	Nature	Magnitude	Spatial Extent	Timing	Duration of Impacts	Reversibility	Likelihood		
								<ul style="list-style-type: none"> <li>Transportation routes for equipment and material deliveries, and for contaminated soil removal should be developed that avoid residential neighbourhoods as much as possible; and</li> <li>Where traffic control is required on public roads, the Contractor will provide a flag person to direct traffic.</li> </ul>	(Minimal, Low, Moderate, High)
Heritage and Cultural Resources	N	S	I	C	S	I	L	<ul style="list-style-type: none"> <li>If artifacts, historical features or human remains are encountered during construction, work activities will be stopped immediately at the area of the discovery and the find reported to the site supervisor and subsequently to the PSPC Project Manager;</li> <li>A qualified archaeologist may be required to investigate and assess the discovery prior to resuming work; and</li> <li>If human remains are discovered during construction activities, the find should be immediately reported to the site supervisor, the PSPC Project Manager and the RCMP.</li> </ul>	Minimal
<b>Malfunctions and Accidents</b>									
Fire	N	M	L	C	S	I	L	<ul style="list-style-type: none"> <li>All flammable waste will be removed on a regular basis and disposed at an appropriate disposal site;</li> <li>Fire extinguisher(s) will be available on-site at all times during all phases of the project, and will comply with and be maintained to the manufacturer's standards;</li> <li>Greasy/oily rags or materials subject to spontaneous combustion will be deposited and stored in appropriate containers and removed from the site on a regular basis for disposal at an appropriate disposal site;</li> <li>All chemicals and fuel will be stored in appropriate facilities that have been designed and constructed in compliance with provincial legislation, codes and guidelines;</li> <li>Smoking will only be allowed in designated outdoor areas that contain appropriate receptacles for disposal of cigarette butts; and</li> <li>An emergency response plan will be developed prior to construction that includes fire and explosion prevention, notification protocols and safe muster areas.</li> </ul>	Minimal
Spills	N	M	L	C	S	I	L	<ul style="list-style-type: none"> <li>All potentially hazardous products required to be present on-site will be stored in a pre-designated, safe and secure product storage area(s) in accordance with applicable legislation;</li> </ul>	Minimal

Potential Effects	Characteristics and Magnitude <sup>1</sup> (before mitigation)							Mitigation Measures	Significance of Residual Effects
	Nature	Magnitude	Spatial Extent	Timing	Duration of Impacts	Reversibility	Likelihood		
								<ul style="list-style-type: none"> <li>Storage sites will be inspected periodically for compliance with requirements;</li> <li>Any used oils or other hazardous liquids will be collected and disposed in compliance with provincial requirements;</li> <li>Vehicles and equipment will be maintained to minimize the potential for leaks. Regular inspection of hydraulic and fuel systems on equipment and machinery will be performed. When detected leaks will be repaired immediately by trained personnel;</li> <li>Refuelling and equipment maintenance will occur at least 100 m away from a waterbody or drainage feature leading to a waterbody, and will be conducted in a manner designed to prevent the release of a hazardous substance;</li> <li>Fuel transfers, including from tanker to storage tank and storage tank to equipment, will be attended and monitored at all times;</li> <li>Standard environmental management practices will be adhered to in order to minimize the risk of accidental spills and potential effects;</li> <li>An emergency spill response plan will be prepared and contain procedures for responding to a spill that include: reporting to the local, provincial and federal authorities as appropriate; taking immediate measures with a spill kit or other suitable alternative to prevent migration of the spill, implementing recovery measures in consultation with appropriate authorities; and undertaking remedial action to remove contaminated material;</li> <li>Training will be provided to on-site construction and operational staff to properly deploy spill response equipment and implement the spill response plan; and</li> <li>Spill response equipment will be available on-site at all times during all phases of the project.</li> </ul>	(Minimal, Low, Moderate, High)
Transportation Accidents	N	M	R	C	S	I	U	<ul style="list-style-type: none"> <li>As described for Transportation above.</li> </ul>	Minimal

### 7.3 MONITORING

The erosion and sediment control monitoring program will focus on all measures employed or needed to prevent erosion on site and migration of eroded soil off-site or into the Souris River. The erosion and sediment control monitoring program will entail the following, in addition to monitoring and recording of general site conditions:

- The Departmental Representative will twice daily conduct a visual inspection of all upland and riverbank erosion and sediment control works; and

- The Contractor will modify and repair all works that are not functioning adequately, under the direction of the Departmental Representative.

## **8.0 SUMMARY AND ANALYSIS**

The overall net effect of the project, considering the mitigation measures described previously, is expected to be positive. This is due to the beneficial soil remediation and site restoration that will permit property divestiture as a remediated site. The site remediation will also contribute to the long-term health of the aquatic environment by reducing the potential for contaminant migration into the Souris River as a result of the removal of the contaminant source along the riverbank and upland areas.

Potential negative effects of the project have been identified; however, mitigation measures are prescribed that reduce the residual negative effects to negligible or minimal, and the effects are not considered to be significant.

## 9.0 DECISION

According to the CEAA 2012, a Federal Authority must not carry out a project on federal lands, or exercise any power or perform any duty or function conferred on under any Act of Parliament other than this Act that would permit a project to be carried out, in whole or in part, on federal lands, unless the project is unlikely to cause significant adverse environmental effects or the Governor in Council decides that those significant adverse environmental effects are justified in the circumstances.

AAFC's decision with respect to this project is as follows:

- AAFC determines that the carrying out of the project is not likely to cause significant adverse environmental effects.
- AAFC determines that the carrying out of the project is likely to cause significant adverse environmental effects, refer to Governor in Council for decision under CEAA 2012 Section 69.

Completed By:

Name	Title	Signature	Date
David Klassen, P.Geol.	Senior Geoscientist EGE Engineering Ltd.		July 26, 2018

Reviewed by:

Name	Title	Signature	Date
Karen Hill	Senior Environmental Specialist, PSPC	 Digitally signed by Hill, Karen Date: 2018.07.30 09:34:42 -05'00'	

Approved by (Environmental Services Unit only\*):

\*For projects under Corporate Management Branch, or CFIA, contact your assigned Environmental Specialist

Name	Title	Signature	Date
Daryl Nazar	Environmental Coordinator AAFC-CPP		July 30, 2018

## **REFERENCES**

### **Project Plans and Drawings**

Figure 01 - Location Plan  
Figure 02 - Site Plan  
Figure 03 - Existing Site Conditions  
Figure 04 - Impacted Areas  
Figure 05 - Proposed Remedial Works  
Figure 06 - Site Restoration

### **Photographs**

Included in text

### **Maps**

Included in text

### **Correspondence**

Transport Canada Navigation Protection Program - Navigation Protection Act Review

### **Permits and Authorizations**

Saskatchewan Water Security Agency - Aquatic Habitat Protection Permit  
Fisheries and Oceans Canada - Fisheries Act Review

### **Related Environmental and Project Studies**

Noted in text

### **Other**

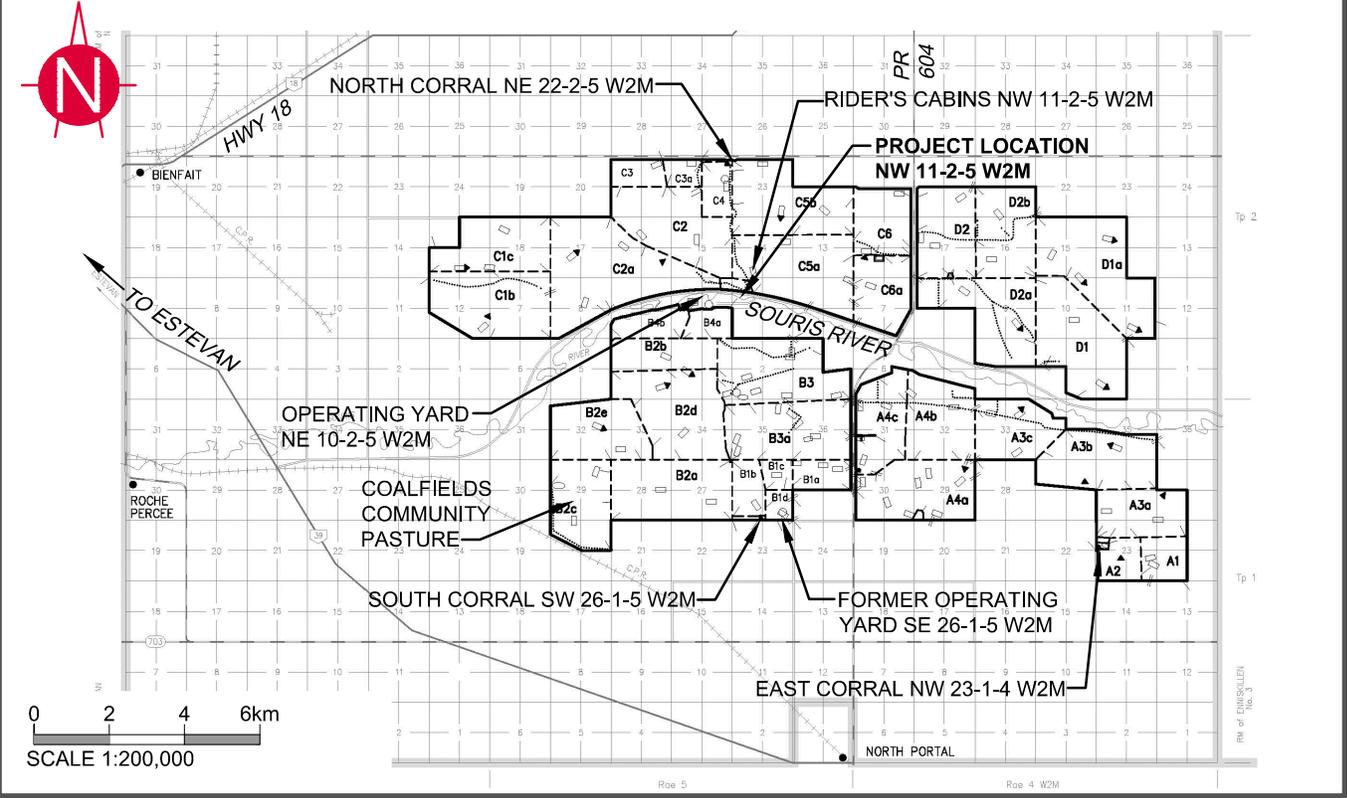
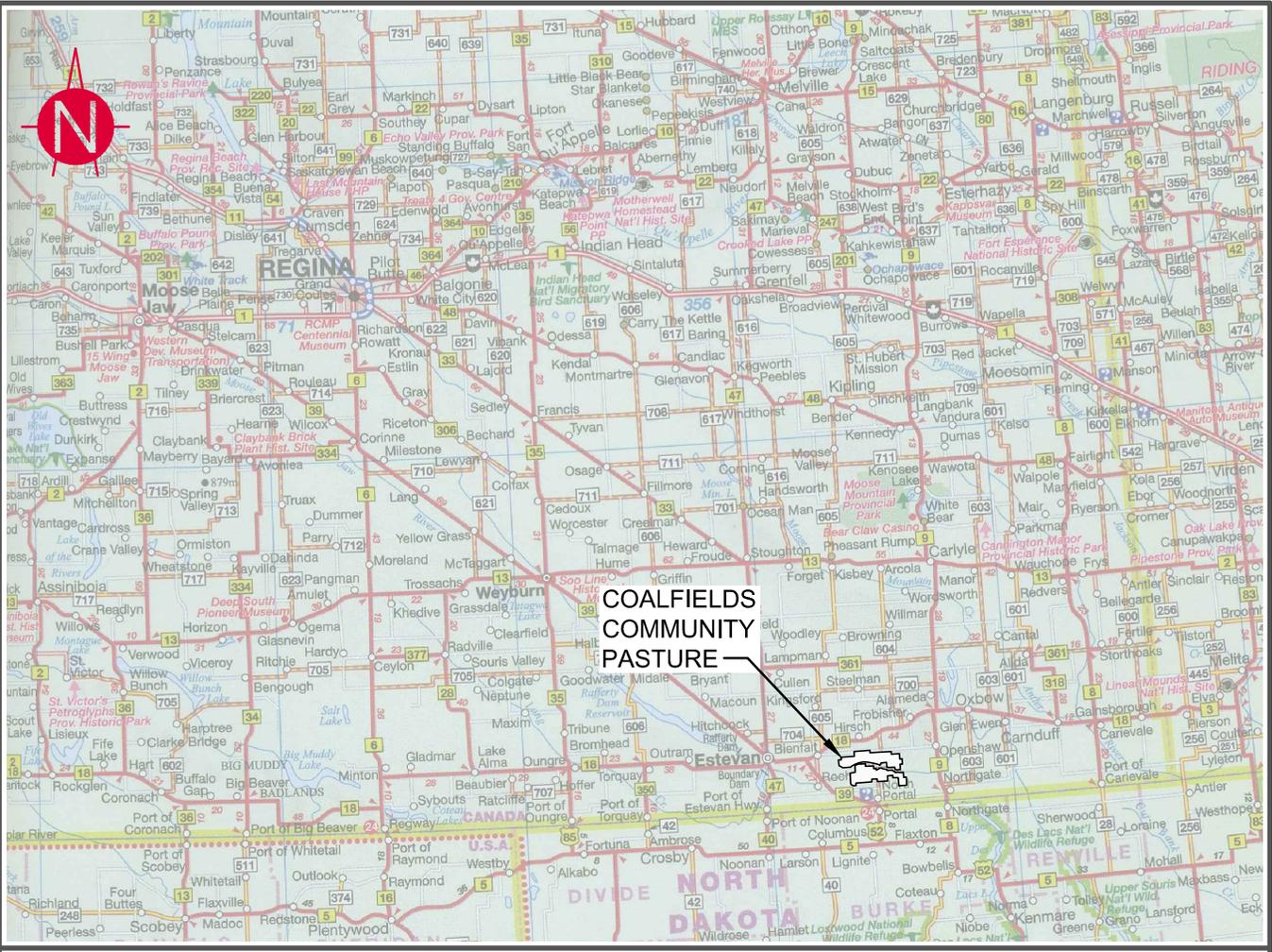
Saskatchewan Conservation Data Centre - Species Listing for 1.0 km radius

## FIGURES

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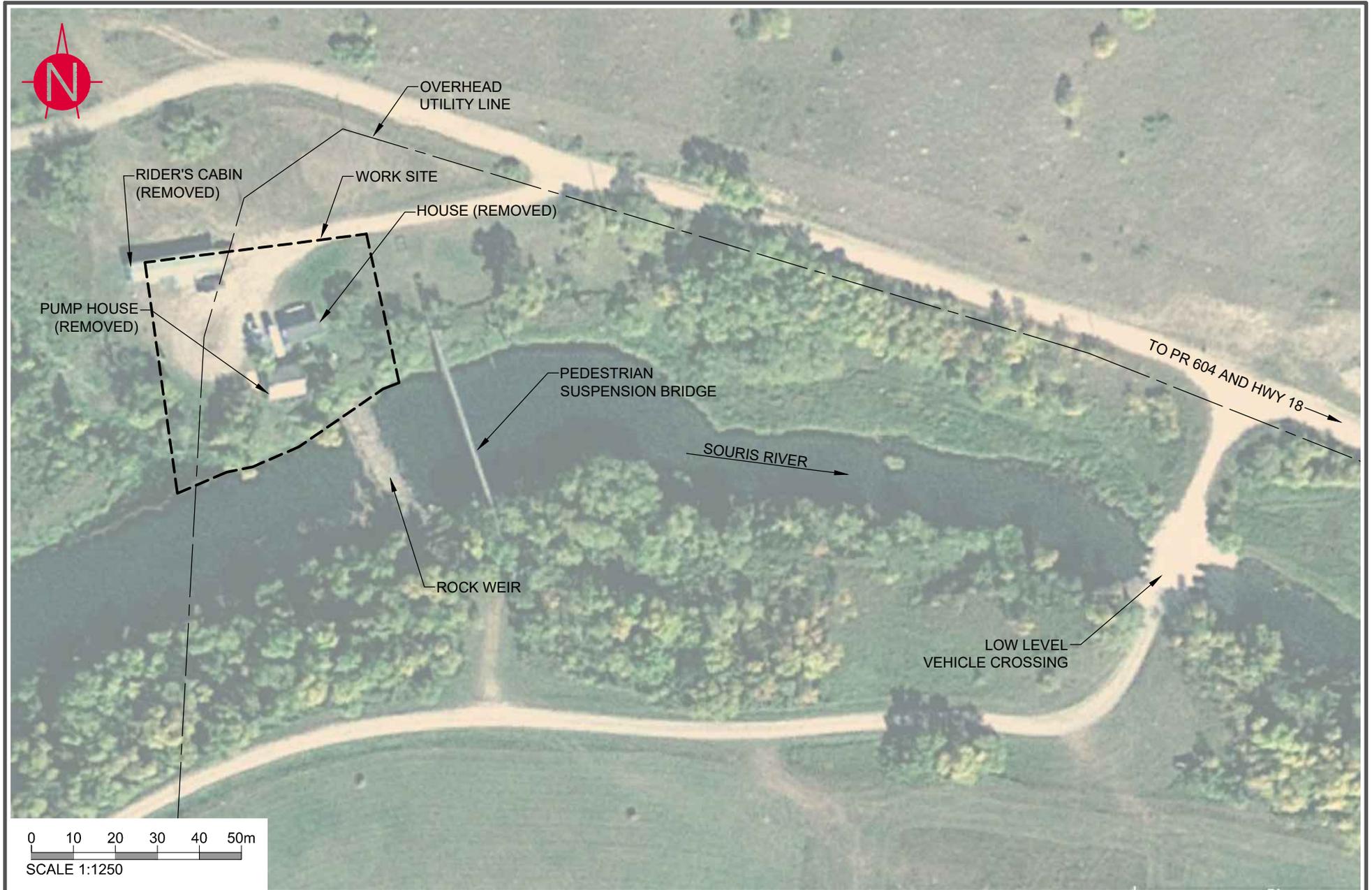
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**EGE**

**Public Services and Procurement Canada**  
**AAFC – Coalfields Community Pasture**  
**NW 11-2-5 W2M, DFRP 13308, Bienfait, SK**  
**Soil Remediation**

**Location Plan**  
**Figure 01**



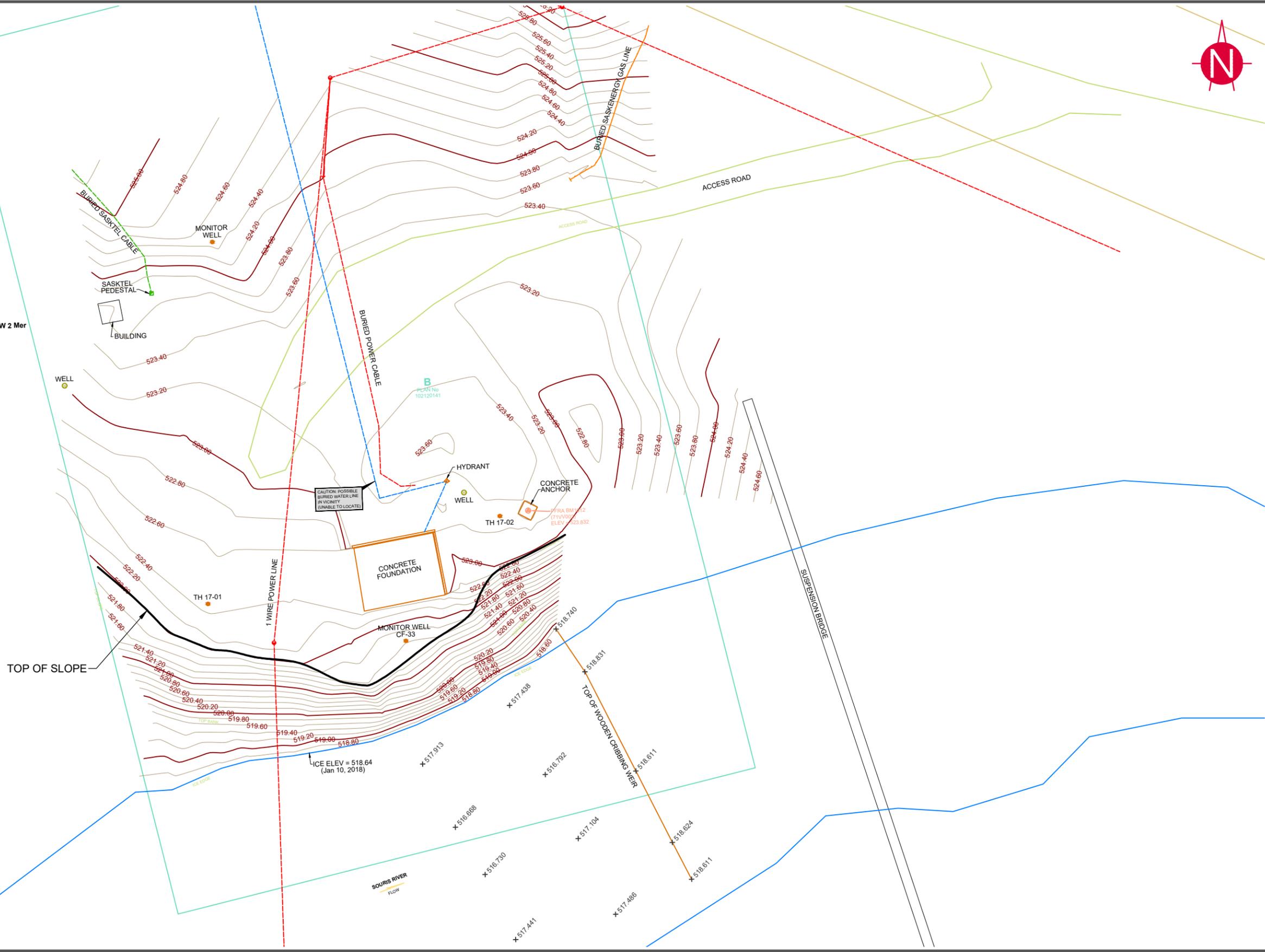
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NW 1/4, Sec 11-2-5 W 2 Mer



EGE

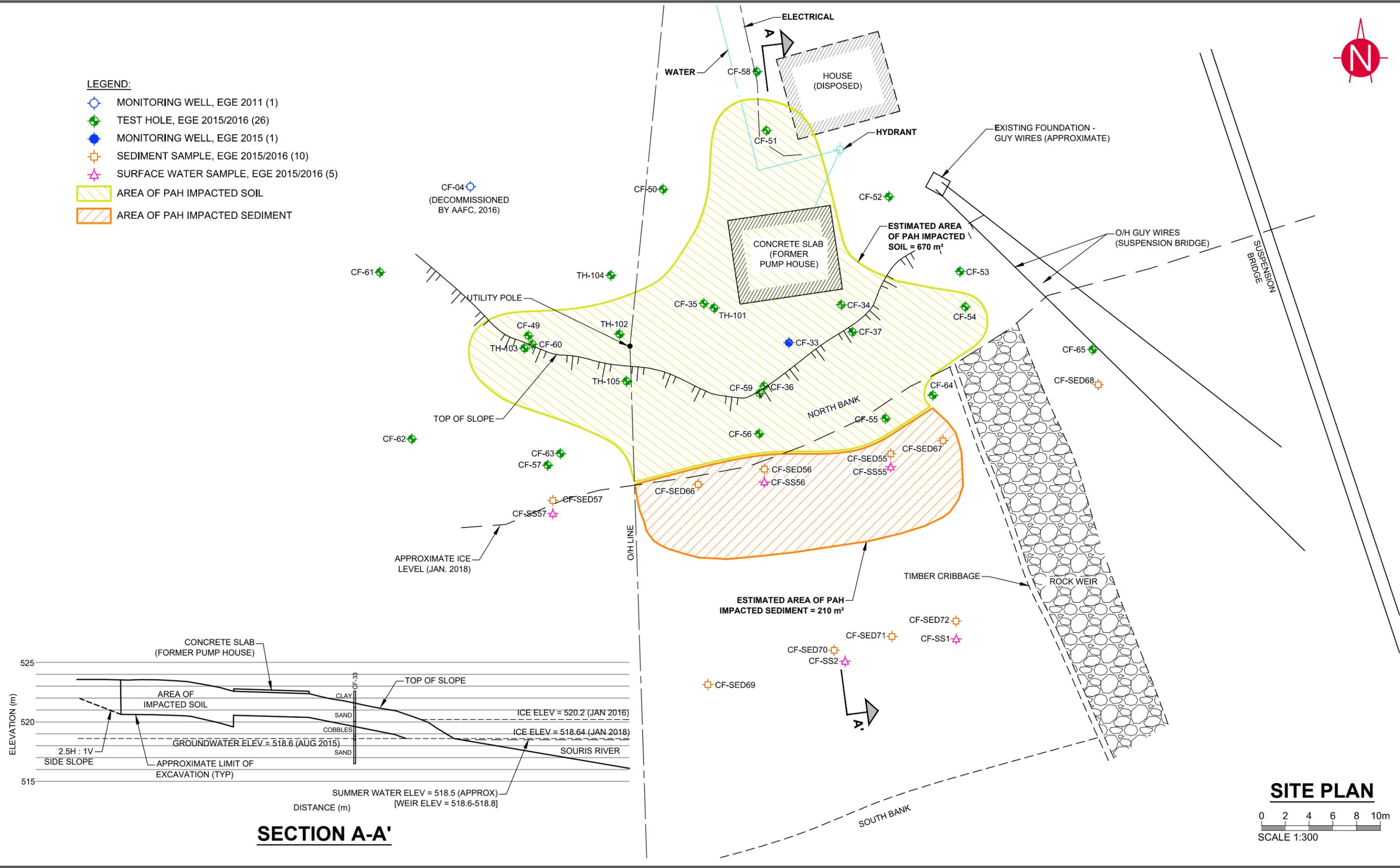
Public Services and Procurement Canada  
 AAFC – Coalfields Community Pasture  
 NW 11-2-5 W2M, DFRP 13308, Bienfait, SK  
 Soil Remediation

Existing Site Conditions

Figure 03

11" x 17"  
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- LEGEND:**
- MONITORING WELL, EGE 2011 (1)
  - TEST HOLE, EGE 2015/2016 (26)
  - MONITORING WELL, EGE 2015 (1)
  - SEDIMENT SAMPLE, EGE 2015/2016 (10)
  - SURFACE WATER SAMPLE, EGE 2015/2016 (5)
  - AREA OF PAH IMPACTED SOIL
  - AREA OF PAH IMPACTED SEDIMENT



**SECTION A-A'**

**SITE PLAN**  
 0 2 4 6 8 10m  
 SCALE 1:300



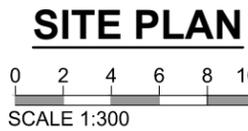
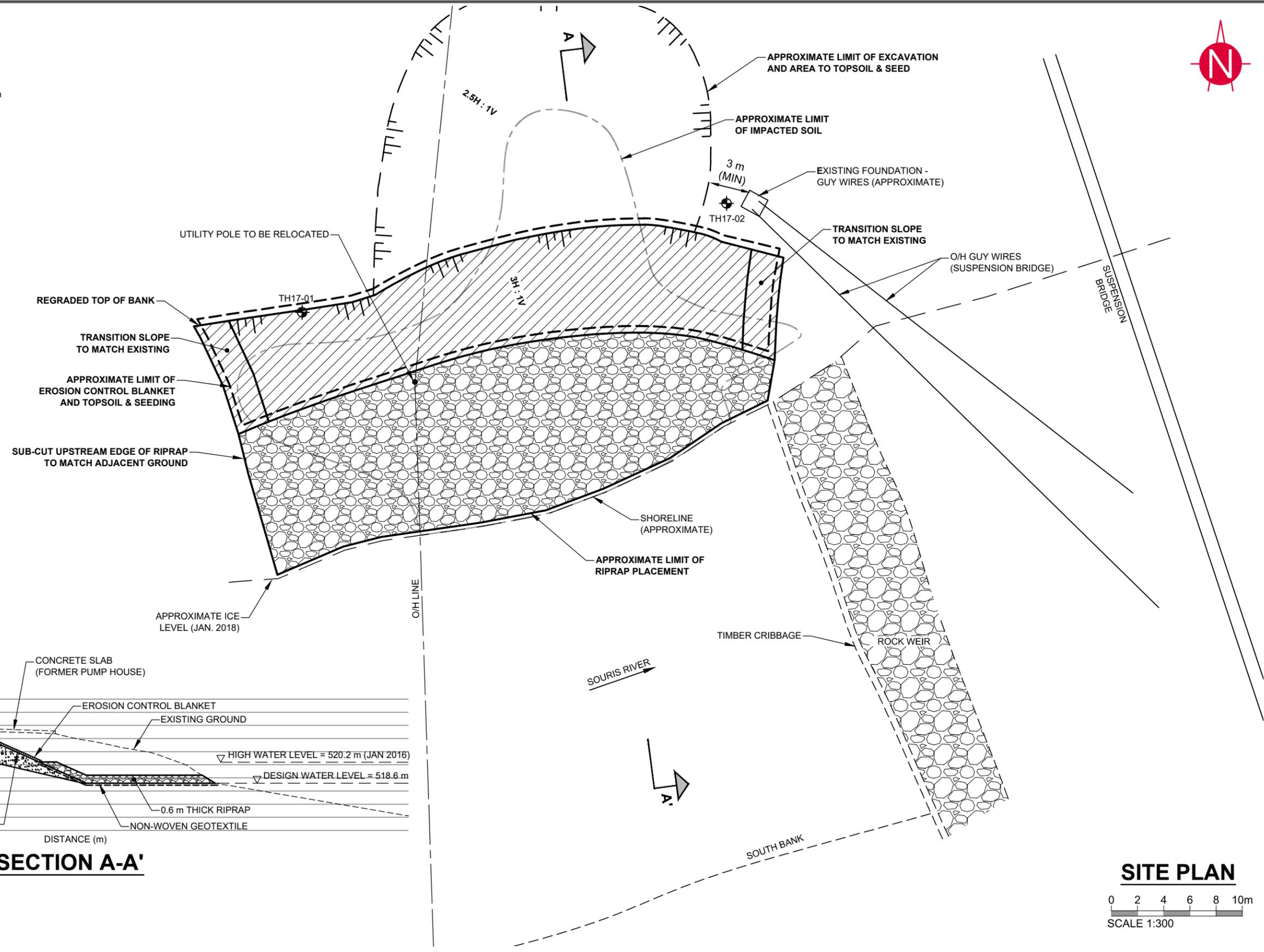
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**NOTES:**

- DISTURBED AREAS TO BE REVEGETATED WITH 100 mm OF TOPSOIL AND SEED.
- EROSION CONTROL BLANKET TO BE INSTALLED ABOVE RIP RAP EXTENDING 0.5 m (MIN) BACK FROM REGRADED TOP OF BANK.

**LEGEND:**

- TEST HOLE (TREK - DECEMBER 6, 2017)



## **CORRESPONDENCE**

**Subject:** RE: AAFC Coalfields CP- NPP Question  
**From:** "Thorsteinson, Inga" <inga.thorsteinson@tc.gc.ca>  
**Date:** 10/01/2018 1:51 PM  
**To:** David Klassen <david.klassen@mts.net>

Ok- thank you!  
Cheers,

Inga Thorsteinson

Navigation Protection Program Officer  
Transport Canada / Government of Canada  
[PPPNR-PPNRPN@tc.gc.ca](mailto:PPPNR-PPNRPN@tc.gc.ca) / Tel: 204-983-8316 / TTY: 1-888-675-6863

Agent de Protection de la Navigation  
Transports Canada / Gouvernement du Canada  
[PPPNR-PPNRPN@tc.gc.ca](mailto:PPPNR-PPNRPN@tc.gc.ca) / Tél : 204-983-8316 / ATS : 1-888-675-6863

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**From:** David Klassen [mailto:david.klassen@mts.net]  
**Sent:** Wednesday, January 10, 2018 1:50 PM  
**To:** Thorsteinson, Inga <inga.thorsteinson@tc.gc.ca>  
**Subject:** Re: AAFC Coalfields CP- NPP Question

Inga,

As per our discussion by phone today, AAFC has withdrawn the requirement to complete sediment remediation at the site. EGE is currently updating the specifications and project description to reflect a scope of work that only includes soil remediation above the high water level of the Souris River.

Therefore, since no work will be conducted within the river, we request that you withdraw the previous application and close the file.

Also, as per our discussion, I will provide the historical review of the property which indicates that the CPR constructed the weir structure in the Souris River at this location. The file is too large to e-mail, so I will upload it for you and send a link to you for download.

David

David Klassen, P.Geo.  
Senior Geoscientist

**EGE Engineering Ltd.**  
**Engineering, Geosciences and Environmental**  
100 - 399 Pembina Hwy  
Winnipeg, Manitoba  
R3L 2E6

Office:(204) 896-8264  
Cell: (204) 612-0944  
e-mail:[david.klassen@mts.net](mailto:david.klassen@mts.net)

On 28/11/2017 10:58 AM, Thorsteinson, Inga wrote:

Hi David,  
I haven't closed this file yet. Can you please confirm that this project is withdrawn because there will be no work below the High Water Mark?

**We are formalizing our project agreement this week to reflect the revised scope of work. I will update you probably next week whether everything is in place and that we intend to eliminate the work in the river.**

Thanks,

Inga Thorsteinson

Navigation Protection Program Officer  
Transport Canada / Government of Canada  
[NPPPNR-PPNRPN@tc.gc.ca](mailto:NPPPNR-PPNRPN@tc.gc.ca) / Tel: 204-983-8316 / TTY: 1-888-675-6863

Agent de Protection de la Navigation  
Transports Canada / Gouvernement du Canada  
[NPPPNR-PPNRPN@tc.gc.ca](mailto:NPPPNR-PPNRPN@tc.gc.ca) / Tél : 204-983-8316 / ATS : 1-888-675-6863

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**From:** Thorsteinson, Inga  
**Sent:** Tuesday, October 03, 2017 3:53 PM  
**To:** 'David Klassen' <[david.klassen@mts.net](mailto:david.klassen@mts.net)>  
**Subject:** RE: AAFC Coalfields CP- NPP Question

Hello- You are correct- if there is no work below the HWL then we have no mandate and the project can be withdrawn from our review. Once I see the revised scope, I can confirm that.

Thanks for the heads-up

Inga Thorsteinson

Navigation Protection Program Officer  
Transport Canada / Government of Canada  
[NPPPNR-PPNRPN@tc.gc.ca](mailto:NPPPNR-PPNRPN@tc.gc.ca) / Tel: 204-983-8316 / TTY: 1-888-675-6863

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[NPPPNR-PPNRPN@tc.gc.ca](mailto:NPPPNR-PPNRPN@tc.gc.ca) / Tél : 204-983-8316 / ATS : 1-888-675-6863

---

**From:** David Klassen [<mailto:david.klassen@mts.net>]  
**Sent:** Tuesday, October 03, 2017 3:49 PM  
**To:** Thorsteinson, Inga <[inga.thorsteinson@tc.gc.ca](mailto:inga.thorsteinson@tc.gc.ca)>  
**Subject:** Re: AAFC Coalfields CP- NPP Question

Inga,

Thanks for that, but I will complicate things a bit by letting you know I just heard from PSPC and AAFC and they have asked us to revise our submissions to remove all sediment remediation work from the scope. They intend to proceed only with work above high water level. I would assume no submission is required for work that does not occur below HWL.

So, you should be able to cancel this project and we'll probably just send you a formal letter indicating that no work will be completed in the river.

I will still seek permission to send you the historical report so you have a file record of who built the weir structure along with the 1913 blueprint showing the profile and construction.

We are formalizing our project agreement this week to reflect the revised scope of work. I will update you probably next week whether everything is in place and that we intend to eliminate the work in the river.

David

David Klassen, P.Geo.  
Environmental Scientist

**EGE Engineering Ltd.**

**Engineering, Geosciences and Environmental**

511 Pepperloaf Crescent  
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R3R 1E6

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Fax: (204) 837-6473

e-mail:[david.klassen@mts.net](mailto:david.klassen@mts.net)

On 03/10/2017 2:45 PM, Thorsteinson, Inga wrote:

Thank you for this.

Looking forward to the historical report. It would be very helpful if it includes a copy of the OIC for the weir (to the CPR from the Crown) That will make things easier for the approval process because I could ignore the weir. I looked at the drawings in the package (Figures 3-6) and the other works aren't shown on there. I can add a note to file with the info you have supplied about the ford crossing , etc. and that would be sufficient for me to proceed with authorizing your dredging promptly. That would be great!!!  
Cheers,

Inga Thorsteinson

Navigation Protection Program Officer  
Transport Canada / Government of Canada  
[NPPPNR-PPNRPN@tc.gc.ca](mailto:NPPPNR-PPNRPN@tc.gc.ca) / Tel: 204-983-8316 / TTY: 1-888-675-6863

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**From:** David Klassen [<mailto:david.klassen@mts.net>]

**Sent:** Friday, September 29, 2017 5:03 PM

**To:** Thorsteinson, Inga <[inga.thorsteinson@tc.gc.ca](mailto:inga.thorsteinson@tc.gc.ca)>

**Subject:** Re: AAFC Coalfields CP- NPP Question

Hi Inga,

I had not forgotten about this, and your timing is good since I have just completed a rather detailed review of the history at this site, including getting some information from Library and Archives Canada going all the way back to 1913. I will have a final report early next week and will ask AAFC if I can provide a copy to you.

In essence, we have confirmed that the CPR was granted a License to build the dam (weir) on the Souris River to impound water within the banks and pump it north to Hirsch, SK (about 7 km away) for storage in a water tower and use for their steam locomotives. CPR completed construction in 1914. They were licensed to remove 145 acre-feet per year. I have some old plans and certificates indicating dam crest elevations and a few other details. Construction was authorized under the Irrigation Act, administered by the Department of the Interior, Irrigation Office.

I would note that the archival information contained a letter from the Department of Public Works indicating it had no knowledge of the dam because the river was not navigable. This was after someone complained about CPR raising the dam height and flooding an upstream ford crossing. Further inspections were made after that complaint (in 1928/1929) and determined the dam was built according to the filed plans and the crest was about 6' above the river bottom.

Information in the file also indicated a third row of piling was located in the river downstream of the two retaining walls, suggested a former dam.

So, AAFC does not own or operate the weir structure. As far as we can tell, it remains the responsibility of the Canadian Pacific Railway. The ford crossing downstream was present as far back as the 1920s, well before AAFC came to purchase the land and AAFC is not responsible

for that crossing either.

In terms of approval for the remediation works, AAFC is now in discussion with CPR about assigning responsibility for the contamination on-site, and the plans may eventually change. However, at this point, AAFC would like to obtain approvals to proceed with the work as we submitted it, so that we can proceed if that is the most appropriate way forward.

Let me know if you need any additional information and I'll try to get you a copy of the full historical report for the site next week.

David

David Klassen, P.Geo.  
Environmental Scientist

**EGE Engineering Ltd.**  
**Engineering, Geosciences and Environmental**  
511 Pepperloaf Crescent  
Winnipeg, Manitoba  
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Fax: (204) 837-6473  
e-mail:[david.klassen@mts.net](mailto:david.klassen@mts.net)

On 20/09/2017 3:34 PM, Thorsteinson, Inga wrote:

Hello David,  
It's been a while since I've received an update on the information request. What is the status of the project. Do they still want to proceed with this?  
Thanks,

Inga Thorsteinson

Navigation Protection Program Officer  
Transport Canada / Government of Canada  
[NPPPNR-PPNRPN@tc.gc.ca](mailto:NPPPNR-PPNRPN@tc.gc.ca) / Tel: 204-983-8316 / TTY: 1-888-675-6863

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[NPPPNR-PPNRPN@tc.gc.ca](mailto:NPPPNR-PPNRPN@tc.gc.ca) / Tél : 204-983-8316 / ATS : 1-888-675-6863

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**From:** David Klassen [<mailto:david.klassen@mts.net>]  
**Sent:** Wednesday, May 10, 2017 1:20 PM  
**To:** Thorsteinson, Inga <[inga.thorsteinson@tc.gc.ca](mailto:inga.thorsteinson@tc.gc.ca)>  
**Cc:** Dan Sonmor <[dan.sonmor@pwgsc-tpsgc.gc.ca](mailto:dan.sonmor@pwgsc-tpsgc.gc.ca)>; Karen Hill <[Karen.Hill@pwgsc-tpsgc.gc.ca](mailto:Karen.Hill@pwgsc-tpsgc.gc.ca)>; Lina Salem-Masri <[Lina.salem-masri@agr.gc.ca](mailto:Lina.salem-masri@agr.gc.ca)>; Bielus, Larry <[lbielus@mts.net](mailto:lbielus@mts.net)>; Jay Toews <[jaytoews@mymts.net](mailto:jaytoews@mymts.net)>  
**Subject:** Re: AAFC Coalfields CP- NPP Question

Hi Inga,

I will look into these issues for you and provide a more detailed response on a few items, but I will need to get clarification from PWGSC/AAFC first.

In terms of the DFO contact for this project, the following DFO contact replied to our submission and indicated a response would be forthcoming in about 6 - 8 weeks. That was on April 24, so early to mid-June would be the anticipated date for DFO to respond.

**Andrew Geraghty**  
Fisheries Protection Program Biologist, Central & Arctic Region

Fisheries and Oceans Canada / Government of Canada  
[Andrew.Geraghty@dfo-mpo.gc.ca](mailto:Andrew.Geraghty@dfo-mpo.gc.ca) / Tel: 905-319-7232

I will request a formal (legal) plan of the site from AAFC. My current understanding is that AAFC constructed and owns the pedestrian bridge that crosses the Souris River, but AAFC did not install and does not own the rock weir in the Souris River. I am not sure on the ownership of the low level vehicle (culvert) crossing downstream. I will confirm each of these items formally with our AAFC project manager.

I will ask PWGSC/AAFC if aboriginal consultation is anticipated.

For your information, I have copied both the PWGSC and AAFC project managers on this reply, along with several others from the EGE team involved in preparing the submissions.

David

David Klassen, P.Geo.  
Environmental Scientist

**EGE Engineering Ltd.**  
**Engineering, Geosciences and Environmental**  
511 Pepperloaf Crescent  
Winnipeg, Manitoba  
R3R 1E6

Ph:(204) 612-0944  
Fax: (204) 837-6473  
e-mail:[david.klassen@mts.net](mailto:david.klassen@mts.net)

On 10/05/2017 11:24 AM, Thorsteinson, Inga wrote:

NPP file 2017-600023

Hello David,

I have been assigned to review your project on the Souris River. Can you please provide a location plan that shows the surveyed boundaries of the Agri-Food Canada property at this site. I need to know who owns the weir, the bridge and the culvert crossing.

Is PWGSC undertaking any Aboriginal Consultation for this project? If so, can you provide that contact.

Also, Who is your contact with DFO? Have they provided any authorizations or direction on this yet?

Thank you,

Inga Thorsteinson

Navigation Protection Program Officer  
Transport Canada / Government of Canada  
[NPPPNR-PPNRPN@tc.gc.ca](mailto:NPPPNR-PPNRPN@tc.gc.ca) / Tel: 204-983-8316 / TTY: 1-888-675-6863

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## **PERMITS AND AUTHORIZATIONS**

**Subject:** Soil Remediation, AAFC Coalfields Community Pasture, Souris River, Bienfait, SK (18-HCAA-00357) – Serious Harm to Fish and Prohibited Effects on Listed Aquatic Species at Risk Can Be Avoided or Mitigated  
**From:** "Epp-Martindale, Jessica" <Jessica.Epp-Martindale@dfo-mpo.gc.ca>  
**Date:** 12/04/2018 8:41 AM  
**To:** David Klassen <david.klassen@mts.net>, "lina.salem-masri@agr.gc.ca" <lina.salem-masri@agr.gc.ca>

**Subject: Soil Remediation, AAFC Coalfields Community Pasture, Souris River, Bienfait, SK (18-HCAA-00357) – Serious Harm to Fish and Prohibited Effects on Listed Aquatic Species at Risk Can Be Avoided or Mitigated**

Dear Ms. Salem-Masri:

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada (DFO) received your proposal on April 3, 2018. We understand that you propose to:

- Excavated contaminated sediments.

Our review considered the following information:

- Request for Review form submitted by David Klassen on April 3, 2018.

Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the *Fisheries Act* unless authorized. Your proposal has also been reviewed to determine whether it is likely to affect listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in a manner which is prohibited under sections 32, 33 and subsection 58(1) of the *Species at Risk Act*, unless authorized.

Provided that your plans are implemented in the manner, and during the timeframe, described, the Program has determined that your proposal will not result in serious harm to fish or prohibited effects on listed aquatic species at risk. As such, an authorization under the *Fisheries Act* or a permit under the *Species at Risk Act* is not required.

Should your plans change or if you have omitted some information in your proposal, further review by the Program may be required. Consult our website (<http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html>) or consult with a qualified environmental consultant to determine if further review may be necessary. It remains your responsibility to avoid causing serious harm to fish in compliance with the *Fisheries Act*, and avoid prohibited effects on listed aquatic species at risk, any part of their critical habitat or the residences of their individuals in compliance with the *Species at Risk Act*.

It is also your *Duty to Notify* DFO if you have caused, or are about to cause, serious harm to fish that are part of or support a commercial, recreational or Aboriginal fishery. Such notifications should be directed to <http://www.dfo-mpo.gc.ca/pnw-ppe/violation-infraction/index-eng.html>.

A copy of this letter should be kept on site while the work is in progress. It remains your responsibility to meet all other federal, territorial, provincial and municipal requirements that apply to your proposal.

If you have any questions with the content of this letter, please contact our Burlington office by email at [fisheriesprotection@dfo-mpo.gc.ca](mailto:fisheriesprotection@dfo-mpo.gc.ca). Please refer to the file number referenced above when corresponding with the Program.

Yours sincerely,

Jessica Epp-Martindale  
Fisheries Protection Biologist  
Fisheries and Oceans Canada

Fisheries and Oceans Canada has changed the way new project proposals (referrals), reports of potential *Fisheries Act* violations (occurrences) and information requests are managed in Central and Arctic Region (Alberta, Saskatchewan, Manitoba, Ontario, Nunavut and the Northwest Territories). Please be advised that general information regarding the management of impacts to fish and fish habitat and self-assessment tools (e.g. Measures to Avoid Harm) that enable you to determine *Fisheries Act* requirements are available at DFO's "Projects Near Water" website at

[www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html](http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html). For all occurrence reports, or project proposals where you have determined, following self-assessment, that you cannot avoid impacts to fish and fish habitat, please submit to [fisheriesprotection@dfo-mpo.gc.ca](mailto:fisheriesprotection@dfo-mpo.gc.ca). For general inquiries, call 1-855-852-8320.

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**From:** David Klassen [mailto:[david.klassen@mts.net](mailto:david.klassen@mts.net)]  
**Sent:** April-03-18 11:17 AM  
**To:** FPP.CA / PPP.CA (DFO/MPO)  
**Subject:** 18-HCAA-00357 Re: Revised Request for Review (1 of 2) - AAFC Coalfields Community Pasture Soil Remediation

Attached is a revised Request-for-Review application for the proposed remediation project at the Coalfields Community Pasture near Bienfait, SK.

The previous application submitted to you for this project included some sediment remediation within the Souris River; however, Agriculture and Agri-Food Canada has revised the scope of work to eliminate all work in the Souris River. The project now includes only soil remediation on the river bank and upland areas, with some minor work below the high water level likely to occur, as the project will take place in the summer when water levels are lower than HWL. There will be no excavation undertaken below the water level at the time of construction.

I will send the full Corrective Action Plan submission to SK MOE (by separate e-mail) as it contains details on the proposed environmental protection measures to be implemented during the project.

As noted by the original e-mail submission for this project below, you have already been provided with a copy of the benthic invertebrate and vegetation survey report, so I have not included that document again.

We have assessed that an Authorization under s. 35 of the Fisheries Act is NOT required for this project, as the purpose and basis of the project is to reduce environmental risk to fish and fish habitat and the project was designed to minimize fish habitat disruption.

Please contact me with any questions or comments.

Thanks,

David

David Klassen, P.Geo.  
Senior Geoscientist

**EGE Engineering Ltd.**  
**Engineering, Geosciences and Environmental**  
100 - 399 Pembina Hwy  
Winnipeg, Manitoba  
R3L 2E6

Office:(204) 896-8264  
Cell: (204) 612-0944  
e-mail:[david.klassen@mts.net](mailto:david.klassen@mts.net)

On 24/04/2017 2:16 PM, Jay Toews wrote:

On behalf of Agriculture and Agri-Food Canada (AAFC) and their contracted engineer (EGE Engineering, Ltd.), I am requesting your review of proposed environmental remediation works at the AAFC Coalfields Community Pasture near Bienfait, Saskatchewan.

We have assessed that an Authorization under s. 35 of the *Fisheries Act* is NOT required for this project, as the purpose and basis of the project is to reduce environmental risk to fish and fish habitat and the project was designed to minimize fish habitat disruption.

The signed Request-for-Review application form is attached to this email. Supporting documents referred to in the application are the Preliminary Design and Remedial Action Plan report and a report on benthic invertebrate and vegetation surveys conducted on the site. The following links will allow you to download these two reports from my DropBox folder:

<https://www.dropbox.com/s/masg590kk1jnv7z/AAFC%20Coalfields%20CP%20CSK-Final%20Pre-Design%20Rpt-170420.pdf?dl=0>

<https://www.dropbox.com/s/c1lp2ag6hbw89dr/Benthic%20Invertebrate%20and%20Vegetation%20Assessment%20Report%20-%20Final.pdf?dl=0>

Please confirm once you have received the application and downloaded the two supporting documents.

I will serve as your primary contact for this project. As listed on the application, you may also contact David Klassen, P.Eng. at EGE Engineering, Ltd. I understand that AAFC will be copied on written correspondence.

Please do not hesitate to contact me by email or at the phone number below with any questions or information.

Thank you.

**Jay Toews, P.Biol.**  
**Toews Aquatics, Chemistry and Limnology**  
**204 479 4235**  
[ToewsAquatics@mtsmail.ca](mailto:ToewsAquatics@mtsmail.ca)



April 18, 2018

(306) 787-1319

VIA EMAIL: [Lina.Salem-Masri@agr.gc.ca](mailto:Lina.Salem-Masri@agr.gc.ca)

Agriculture and Agri-Food Canada  
Attention: Lina Salem-Masri  
960 Carling Avenue, Building 12, CEF  
OTTAWA ON K1A 0C6

File number:  
2017-WEYB-022-YK7

Dear Ms. Salem-Masri:

**Re: Aquatic Habitat Protection Permit for Soil Remediation and Streambank Restoration within the Coalfields Community Pasture at NW 11-02-05 W2 beside the Souris River- NEW**

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Please find enclosed the Aquatic Habitat Protection Permit authorizing you to proceed with soil remediation and streambank restoration at the above location insofar as the Water Security Agency is concerned.

It is understood from your application dated March 19, 2018, that you propose to remove contaminated soil from the upland and streambank areas along the Souris River near the former rider's cabin site and pedestrian suspension bridge. Clean backfill will be used to restore the excavated upland areas and streambank. The project is anticipated to take 15 days to complete and involves the following:

**Site Preparation**

- Demolition of the existing concrete foundation at the former pump house;
  - Concrete will be disposed of off-site at an appropriate site;
- Decommissioning of well CF-33;
- Clearing and grubbing vegetation from the work area;
  - Completed primarily by hand to avoid capturing contaminated surface soil;
- Establishment of perimeter drainage swales around the proposed excavation to manage surface runoff.
  - Swales will be directed to the river or roadway ditches; and
  - Silt fence will be installed at the outlets to minimize the risk of sediment transport to the river.

**Excavation of Contaminated Soil**

- Approximately 1,085 m<sup>3</sup> (total) of soil will be excavated from the upland and river bank areas using heavy equipment;
- River bank excavation will be limited to areas above the water level in the Souris River at the time of construction;
- Stockpiling of excavated materials on site will be minimized to prevent contamination of adjacent soils and waters;

.../2

- Contaminated spoil materials will be hauled off-site and disposed of at a licensed soil treatment facility;
- Water in the excavated area will be managed by excavating a sump pit and pumping out the water using a hydrovac truck;
  - Water entering the excavation area will be considered contaminated and will be disposed of appropriately; and
- Clean overburden soil (free of contamination) will be excavated and stockpiled on site for reuse as clean fill material.

### **Backfilling and Site Restoration**

- Clean backfill material will be of similar type to the material excavated from the site and have similar drainage characteristics;
- The river bank will be reconstructed to a 3H:1V slope or flatter;
- A 0.6 m thick rockfill riprap blanket underlain by geotextile fabric will be placed on the slope from the river level to the high water level (520.2 m);
- A minimum of 100 mm of topsoil will be placed on the riverbank and upland areas and all other areas disturbed by work activities;
- All disturbed areas will be seeded with a seed mixture consistent with natural prairie and riparian vegetation; and
- Erosion control blanket will be installed on the riverbank to from the new top of bank extending down to the riprap.

### **Additional Environmental Protection Measures**

- Silt fence will be installed along the river bank to prevent sediment from entering the Souris River;
- Runoff velocities will be minimized using appropriate grading and berms;
- All equipment will be refilled a minimum of 100 m from any water body or watercourse;
- Erosion and sediment control works will be inspected twice daily and maintained, modified and repaired as necessary; and
- Work will occur in late summer or early fall.

If the project changes in any way from that submitted, or the conditions of the attached permit cannot be met, this permit is no longer valid. Please contact this office so that further review and approvals may be carried out.

**Prior to beginning the work associated with this Aquatic Habitat Protection Permit, a Conservation Officer must be notified at the Ministry of Environment district office in Estevan. The phone number for this office is (306) 637-4600.**

Flows on this reach of the Souris River are managed by the Water Security Agency. For information on flow rates expected during your project, to temporarily or permanently add your contact information to notification lists used when flows will be changing rapidly, and/or to discuss any limitations you may have on flows during your project, please contact Curtis Hallborg, Manager, Flow Forecasting and Operations Planning at (306) 694-3942 or [Curtis.Hallborg@wsask.ca](mailto:Curtis.Hallborg@wsask.ca). While WSA cannot make any guarantees that flows will be able to be managed to meet your project's needs, they will be considered when making operating decisions and notifications of changing flow will be provided when necessary.

.../3

Please be advised that a search of the Saskatchewan Conservation Data Centre database has revealed the historical presence of the following **Species-at-Risk** plants at your work location:

- Blue Vervain (*Verbena hastata*)
- White Milkwort (*Polygala alba*)
- Crowfoot Violet (*Viola pedatifida*)
- Narrow-leaved Purple Coneflower (*Echinacea angustifolia* var. *angustifolia*)
- Whorled Milkweed (*Asclepias verticillata*)
- Prairie Bird's-foot-trefoil (*Lotus unifoliolatus* var. *unifoliolatus*)
- Side-oats Grama (*Bouteloua curtipendula* var. *curtipendula*)
- Big Bluestem (*Andropogon gerardii*)

We recommend that you contact Environment Canada for information on how to proceed should you encounter one or more of these species at your work site.

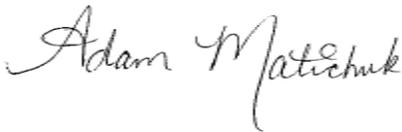
Permit holders are reminded that the discharge of any substance that may cause an adverse effect or is covered by *The Environmental Management and Protection (Saskatchewan Environmental Code Adoption) Regulations, 2010* shall be reported to the Ministry of Environment (MOE) at 1-800-667-7525. Should you require more information on discharges and spills, please check Saskspills (<https://www.saskatchewan.ca/business/environmental-protection-and-sustainability/hazardous-materials-and-safe-waste-management>) or the MOE website (<http://www.environment.gov.sk.ca>). You may also contact the MOE Client Service Office at 1-800-567-4224.

This Aquatic Habitat Protection Permit is valid only so far as the Water Security Agency is concerned and does not release you from the responsibility of obtaining any other approvals that may be required under federal, provincial or municipal legislation. The permit holder is responsible to obtain the necessary approvals from the local municipality for these improvements. Land control and access are also the responsibility of the permit holder.

If you have any questions, please contact me at (306) 787-1319 or at [Adam.Matichuk@wsask.ca](mailto:Adam.Matichuk@wsask.ca).

Sincerely,

WATER SECURITY AGENCY



Adam Matichuk  
Aquatic Habitat Protection Specialist  
Environmental and Municipal Management Services

cc: Chad Shapley, Conservation Officer, Ministry of Environment, Estevan  
Dwayne Siba, Annette Lohse, Regional Services, Water Security Agency, Weyburn  
Curtis Hallborg, Manager, Flow Forecasting and Operations Planning, Water Security Agency, Moose Jaw  
David Klassen, EGE Engineering Ltd., Winnipeg

Enclosure



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**AQUATIC HABITAT****PROTECTION PERMIT**

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Pursuant to Section 6 of *The Environmental Management and Protection (General) Regulations, 2010*, permission is hereby granted to Agriculture and Agri-Food Canada ("Permit Holder"), and any authorized agents acting on behalf of Agriculture and Agri-Food Canada, to proceed with the soil remediation and streambank restoration within the Coalfields Community Pasture at NW 11-02-05 W2 beside the Souris River, according to the application and additional plans submitted to the Water Security Agency on March 19, 2018.

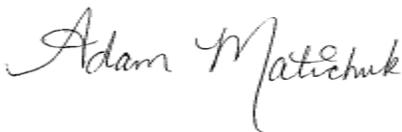
This permit is issued subject to and restricted to the following conditions:

1. A Conservation Officer shall be contacted at (306) 637-4600 prior to beginning this work so that the appropriate inspections may be conducted.
2. All contractors are to receive copies of all permits before they begin any work. A copy of the permit must be on site at all times and available for review by a Conservation Officer.
3. Access to the project site must be by existing roads, trails, stable areas devoid of riparian vegetation and during the winter access is permitted from the ice (i.e. frozen waterbody).
4. No in-water or shoreline work is permitted between April 1 and May 31 to protect fish during spawning and incubation periods.
5. No excavation of the bed of the Souris River is permitted.
6. Machinery and heavy equipment must arrive at the project site clean and free of fluid leaks, or accumulations of external contaminants that may include, but are not limited to: oil, fuel, grease, other lubricants, soils, mud or plant materials.
7. Machinery and heavy equipment must be cleaned, fuelled, serviced and stored in a manner that will not contaminate the bed, bank or boundary of any water body or watercourse. During winter, machinery and equipment must not be fuelled or serviced on ice to prevent hazardous substances from contaminating water bodies or watercourses later in the year. All machinery must be removed from the ice surface at the end of each work day.
8. No machinery or heavy equipment is to enter the water under any circumstances. The only exceptions are the use of necessary attached booms, buckets, other tools or implements.
9. Effective measures must be used to minimize any damage to the bed, bank or boundary of any water body or watercourse from the transport and operation of heavy equipment. Machinery and heavy equipment must be located and operated from a stable location above the natural bank. During frozen conditions working from the ice is permitted.

10. Prior to re-contouring the bank, the work site must be adequately isolated by installing a silt fence (or similar) to prevent sediment from migrating off the work site.
11. During construction and until a stable streambank is re-established, effective sediment and erosion control measures must be used on disturbed areas to prevent sediment-laden runoff from entering the watercourse.
12. Sediment control measures will be regularly inspected and maintained or repaired if any damage occurs.
13. No earthen fill, sand or any other material shall be pushed into the water or deposited below the bank.
14. Fill material is only permitted above the water level and must be effectively contained so that it cannot erode into the river.
15. When contouring, material shall only be excavated via a pull-back method from the shoreline and stabilized in a manner that prevents it from eroding into any water body or watercourse.
16. Stabilization materials and methods used shall follow the natural contours and slope of the bank of the water body or watercourse.
17. To maintain shoreline stability, no rock shall be removed from the bed, bank or boundary of any water body or watercourse.
18. Existing vegetation shall be retained as much as possible.
19. Any debris or terrestrial vegetation trimmed to facilitate shoreline stabilization shall be disposed of in a manner that prevents it from re-entering any water body or watercourse.
20. Rock rip rap, gravel and other excavated material shall be obtained from outside the bed, bank or boundary of any watercourse or water body, with the exception of materials that need to be relocated as part of the project. These materials must also be clean and free from fine sediment or other contaminants.
21. Rock rip rap shall be appropriately sized to withstand the forces of wave and ice action and follow the original contour of the shoreline and bank.
22. Adequate precautions must be taken to prevent debris and sediment from entering the water. Any project debris entering the water must be removed as soon as practical and must be disposed of in approved sites.
23. All project debris, including any structures removed or replaced, contaminated soil and temporary works must be removed and disposed of appropriately.
24. Excavated and stockpiled materials shall be located above the bank and stabilized so they will not erode into any water body or watercourse.
25. Areas used for stockpiling construction materials or other equipment storage must be back from the bank and if possible, in areas which have already been disturbed or are devoid of vegetation.

26. Hazardous substances such as fuel, oil, grease, paint and solvents must be stored where they will not contaminate any water body or watercourse and must be disposed of appropriately.
27. All disturbed project site areas shall be stabilized with short and long-term erosion sedimentation control measures that have been tailored to site conditions.
28. All stationary and portable fuel tanks, pumps and engines within 100 metres of a water body or watercourse must have secondary containment (e.g. a water pump and its fuel supply must be placed in a container that is capable of holding 110% of the total volume of fuel and oils).
29. Appropriately sized spill basins and/or spill kits for clean ups must be on site and accessible at all times. All spills of harmful substances (e.g. petroleum products) must be cleaned up and disposed of properly at approved sites.
30. All spills of any oil, fuel, hydraulic fluids or waste dangerous goods must be immediately contained and reported to a Conservation Officer at (306) 637-4600. All spills meeting or exceeding the quantities specified in the *Environmental Management and Protection (Saskatchewan Environmental Code Adoption) Regulations, 2010* must be reported and handled according to the regulations. The Provincial Spill Control Centre (Spill Line) is 1-800-667-7525.
31. The Permit Holder is solely responsible for all design, safety, and workmanship aspects of all works associated with this permit.
32. The Water Security Agency or Ministry of Environment may order the Permit Holder to cease any or all work regarding this project if, in the Agency's opinion, the work is or may cause harm to the environment.
33. The Water Security Agency or Ministry of Environment may order the Permit Holder to do any further work required to rectify any actual or potential problems deemed necessary to protect the environment.
34. The Permit Holder agrees to all conditions and/or orders regarding this permit.
35. This permit does not replace or supersede any approvals, licenses or authorizations, including building permits that may be required from municipal, provincial or federal legislation. The permit holder will maintain in force all such approvals, license or authorizations that may be required.
36. This permit is valid until **March 31, 2019**. Re-application is required if further work is planned.

WATER SECURITY AGENCY



Adam Matichuk  
Aquatic Habitat Protection Specialist,  
Environmental and Municipal Management Services

**OTHER**

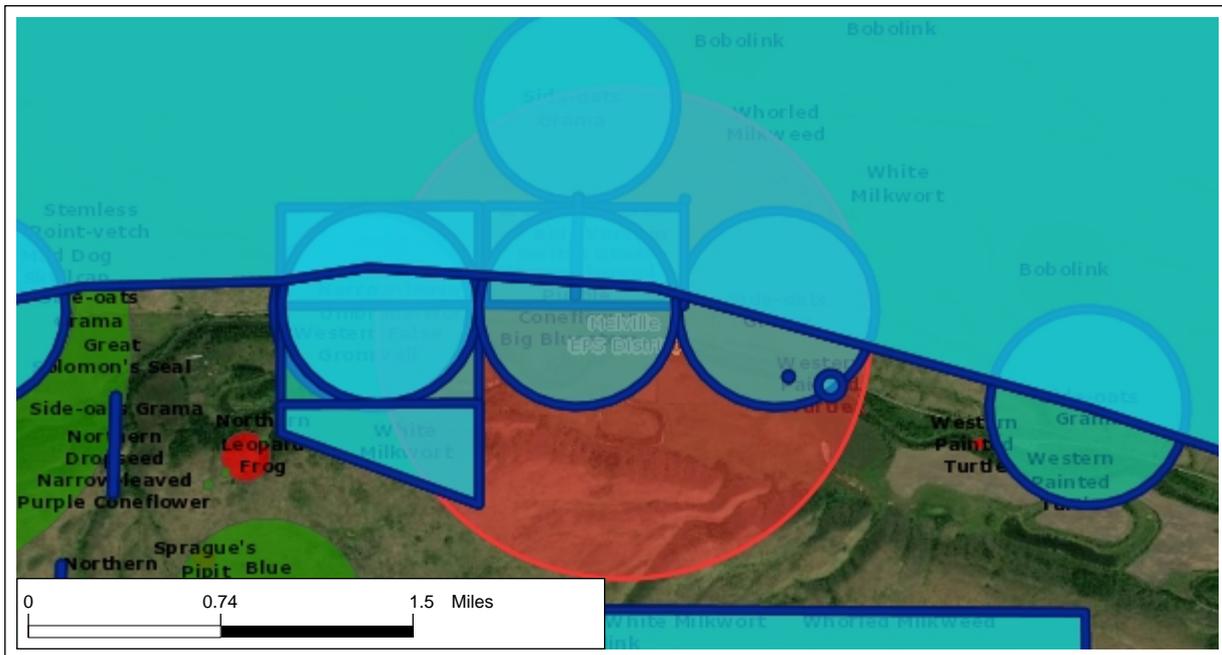
# Rare and Endangered Species Report

Report Generated: 7/10/2018 9:34:42 AM

The absence of information provided by the Saskatchewan Conservation Data Centre (SKCDC) does not categorically mean the absence of sensitive species or features. The quantity and quality for data collected by the SKCDC are dependent on the research and observations of many individuals and organizations. SKCDC reports summarize the existing natural heritage information, known to the SKCDC, at the time of the request.

SKCDC data should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The user therefore acknowledges that the absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources.

*Rare and Endangered Species Area of Interest*



# Rare and Endangered Species Report

---

**Scientific Name:** *Andropogon gerardii*

**Common Name:** Big Bluestem

**Provincial Rank:** S4

**Global Rank:** G5

**Observation: First:** 1962-08-15

**Last:** 2004-07

**Provincial Legal Status:**

**Species at Risk Act Status:**

**COSEWIC Status:**

**General Description:**

**Occurrence ID:** 15026

**Occurrence Class:** Vascular Plant

**Occurrence Type:**

**Occurrence Rank:** AB - Excellent or good estimated viability

**Occurrence Data:**

1962 - species observed in 9 sites. 2004: at least 55 plants reported. Big Bluestem (*Andropogon gerardii*) was relatively common, occurring on the moister sites of lower to mid-slope positions of valleys. In Saskatchewan, this species is restricted to the southeast corner of the province. Big Bluestem was found on 58% of the transects and 7% of the total transect length surveyed.

**Directions:**

-between Bienfait, Roche Percee, North Portal, and Frobisher

---

**Scientific Name:** *Verbena hastata*

**Common Name:** Blue Vervain

**Provincial Rank:** S2

**Global Rank:** G5

**Observation: First:**

**Last:** 1987 08 16

**Provincial Legal Status:**

**Species at Risk Act Status:**

**COSEWIC Status:**

**General Description:**

ALONG MOIST, STONY, GRASSY & SOMEWHAT LOW-SHRUBBY BOTTOM OF COULEE N OF SOURIS RIVER. LOCALLY CA 2 DOZEN PLANTS

**Occurrence ID:** 7169

**Occurrence Class:** Vascular Plant

**Occurrence Type:** SPECIMEN (COLLECTED)

**Occurrence Rank:** E - Verified extant (viability not assessed)

**Occurrence Data:**

**Directions:**

CA 11 KM N & 2 KM W OF NORTH PORTAL (CA 5 KM W OF PORTAL ROAD).

## Rare and Endangered Species Report

---

**Scientific Name:** *Viola pedatifida*  
**Common Name:** Crowfoot Violet  
**Provincial Rank:** S3                   **Global Rank:** G5  
**Observation: First:** 2004- July                   **Last:** 2004-07

**Occurrence ID:** 15032  
**Occurrence Class:** Vascular Plant  
**Occurrence Type:**  
**Occurrence Rank:** B - Good estimated viability

**Provincial Legal Status:**  
**Species at Risk Act Status:**  
**COSEWIC Status:**  
**General Description:**

**Occurrence Data:**  
2004: > 17 plants reported. It occurred on 32% of the transects and along 2% of the total transect length.

### Directions:

-between North Portal, Frobisher, Roche Percee, and Bienfait.

---

**Scientific Name:** *Scutellaria lateriflora*  
**Common Name:** Mad Dog Skullcap  
**Provincial Rank:** S3                   **Global Rank:** G5  
**Observation: First:** 1987 08 16                   **Last:** 1987 08 16

**Occurrence ID:** 7984  
**Occurrence Class:** Vascular Plant  
**Occurrence Type:**  
**Occurrence Rank:**

**Provincial Legal Status:**  
**Species at Risk Act Status:**  
**COSEWIC Status:**  
**General Description:**

**Occurrence Data:**

In narrow strip of Ash - Boxelder - Elm riverine woods, along Souris River shores, At shoreline bank base,

### Directions:

Souris River Valley, ca 11 km N & 2 km W of North Portal, ca 5 km W of Portal Road

# Rare and Endangered Species Report

---

**Scientific Name:** *Scutellaria lateriflora*

**Common Name:** Mad Dog Skullcap

**Provincial Rank:** S3

**Global Rank:** G5

**Observation: First:** 1986 08 16

**Last:** 1986 08 16

**Provincial Legal Status:**

**Species at Risk Act Status:**

**COSEWIC Status:**

**General Description:**

In narrow strip of semi-open Elm / Boxelder / Ash riverine, woods along Souris River channel, On vertical bank base edging marshy river shoreline,

**Occurrence ID:** 8029

**Occurrence Class:** Vascular Plant

**Occurrence Type:**

**Occurrence Rank:**

**Occurrence Data:**

**Directions:**

Souris River Valley; N of Souris River across from PFRA, Community Pasture HQ. Ca 5 km W of jct with Portal Road, (ca 11 km N & 2 km W of North Portal)

---

**Scientific Name:** *Echinacea angustifolia* var. *angustifolia*

**Common Name:** Narrow-leaved Purple Coneflower

**Provincial Rank:** S3

**Global Rank:** G4T4

**Observation: First:** 1962-08-15

**Last:** 2004-07

**Provincial Legal Status:**

**Species at Risk Act Status:**

**COSEWIC Status:**

**General Description:**

**Occurrence ID:** 15024

**Occurrence Class:** Vascular Plant

**Occurrence Type:**

**Occurrence Rank:** A - Excellent estimated viability

**Occurrence Data:**

Souris River Valley Coalfields area 1962 - species observed in 1 site. 1986 - 2 sites. fairly frequent 1987- 1 site. fairly frequent 2004 survey - > 200 plants reported in 16 sites.

**Directions:**

Coalfields Area - area between Bienfait, Roche Percee, North Portal, and Frobisher

## Rare and Endangered Species Report

---

**Scientific Name:** *Mirabilis linearis*  
**Common Name:** Narrow-leaved Umbrella-wort  
**Provincial Rank:** S3                   **Global Rank:** G5  
**Observation: First:** 1987-08-16                   **Last:** 1987-08-16

**Occurrence ID:** 999976395  
**Occurrence Class:** Vascular Plant  
**Occurrence Type:**  
**Occurrence Rank:**

**Provincial Legal Status:**  
**Species at Risk Act Status:**  
**COSEWIC Status:**  
**General Description:**  
specimen collected (1987)

**Occurrence Data:**

### Directions:

Souris River Valley, SE Saskatchewan. Ca. 11 km north and 2 km west of North Portal. (Ca. 5 km west of Portal Road).

---

**Scientific Name:** *Lotus unifoliolatus* var. *unifoliolatus*  
**Common Name:** Prairie Bird's-foot-trefoil  
**Provincial Rank:** S2                   **Global Rank:** G5T5  
**Observation: First:** 1987-08-16                   **Last:** 1987-08-16

**Occurrence ID:** 2057  
**Occurrence Class:** Vascular Plant  
**Occurrence Type:**  
**Occurrence Rank:** BC - Good or fair estimated viability

**Provincial Legal Status:**  
**Species at Risk Act Status:**  
**COSEWIC Status:**  
**General Description:**

**Occurrence Data:**  
1987: Locally fairly numerous.

In coulee bottom along edges of streamlet tributary paralleling Souris River ca 1/2 mi. to N. Locally fairly numerous.

### Directions:

Ca. 4 mi. S. of Hirsch (7 mi.N.and 2 mi.W of Portal)

# Rare and Endangered Species Report

---

**Scientific Name:** *Lotus unifoliolatus* var. *unifoliolatus*  
**Common Name:** Prairie Bird's-foot-trefoil  
**Provincial Rank:** S2                      **Global Rank:** G5T5  
**Observation: First:** 2004- July                      **Last:** 2004-07

**Occurrence ID:** 15030  
**Occurrence Class:** Vascular Plant  
**Occurrence Type:**  
**Occurrence Rank:** B - Good estimated viability

**Provincial Legal Status:**  
**Species at Risk Act Status:**  
**COSEWIC Status:**  
**General Description:**

**Occurrence Data:**  
2004: 17 areas with plants reported along 5 transects. It occurred on 26% of the transects surveyed and on 2% of the total transect length.

## Directions:

-between Bienfait, Roche Percee, North Portal, Frobisher.

---

**Scientific Name:** *Bouteloua curtipendula* var. *curtipendula*  
**Common Name:** Side-oats Grama  
**Provincial Rank:** S3                      **Global Rank:** G5T5  
**Observation: First:** 1962-08-15                      **Last:** 2004-07

**Occurrence ID:** 925  
**Occurrence Class:** Vascular Plant  
**Occurrence Type:**  
**Occurrence Rank:** A - Excellent estimated viability

**Provincial Legal Status:**  
**Species at Risk Act Status:**  
**COSEWIC Status:**  
**General Description:**

**Occurrence Data:**  
SRC survey: at least 57 plants reported. Site 3: Fairly numerous locally, Site 4: Locally fairly numerous, Site 5: Fairly frequent, Site 6: Locally frequent, Site 7: Locally quite numerous, Site 8: Locally several; not common, Site 9: Fairly frequent locally, Site 10: Fairly frequent, Site 11: Fairly frequent, Site 12: Locally frequent, Site 13: Occasional

Site 1: S-facing slope, N of Souris River Site 2: Coulee slope; rocky; E of Portal Road Site 3: S-facing slopes of prairie bluffs, N of Souris River At mid-slopes Site 4: Steepish, S-facing slopes of grassland bluffs Near boulders Site 5: Low, SE-facing, overgrazed prairie bluffs N of Souris River Site 6: S-facing slopes of bluffs N of Souris River Mesic grassland with sandstone outcrops Site 7: On S-facing prairie bluff slopes above tributary coulee Site 8: High

## Directions:

Site 1: Souris River Valley 7 mi N of North Portal; between headquarters of Coalfields Community Pasture and Portal Road Sec 12 T02 R05 W2. (49.12N 102.58W) Site 2: Approximately 5½ mi N of North Portal in Coalfields Community Pasture, A4 Study Site Sec 37 T01 R04 W2. (49.12N 102.58W) Site 3: Souris River Valley 1½ mi N & 2½ mi W of Elcott LSD 14-15 (NC) Sec 28 T01 R03 W2 (49.08N 102.37W) Site 4: Souris River Valley; N of Souris River Junction of Portal Road & Coalfields Community Pasture Road 7 mi N & 1 mi E of North Portal SE07 T02 R04 W2 (49.12N 102.55W)

## Rare and Endangered Species Report

---

**Scientific Name:** *Panicum virgatum var. virgatum*  
**Common Name:** Switch Grass  
**Provincial Rank:** S2                   **Global Rank:** G5T5  
**Observation: First:** 1987-09-16                   **Last:** 1987-09-16

**Occurrence ID:** 999973953  
**Occurrence Class:** Vascular Plant  
**Occurrence Type:**  
**Occurrence Rank:**

**Provincial Legal Status:**  
**Species at Risk Act Status:**  
**COSEWIC Status:**  
**General Description:**  
locally fairly numerous (1987)

**Occurrence Data:**

### Directions:

North Portal ca 5 km W of Portal Road. N part NW Sec 11 T02 R05 W2

---

**Scientific Name:** *Onosmodium molle var. occidentale*  
**Common Name:** Western False Gromwell  
**Provincial Rank:** S2                   **Global Rank:** G4G5T4?  
**Observation: First:** 1987-08-16                   **Last:** 1987-08-16

**Occurrence ID:** 2017  
**Occurrence Class:** Vascular Plant  
**Occurrence Type:**  
**Occurrence Rank:**

**Provincial Legal Status:**  
**Species at Risk Act Status:**  
**COSEWIC Status:**  
**General Description:**  
In tall buckbrush thicket bordering riverine woods along Souris River Sparse local colony

**Occurrence Data:**

### Directions:

Souris River Valley ca 11 km N & 2 km W of North Portal (ca 5 km W of Portal Road) (49 07'N 102 36'W) 49.12 102.6 NE1/4 Sec 10 T02 R05 W2

## Rare and Endangered Species Report

---

**Scientific Name:** *Polygala alba*  
**Common Name:** White Milkwort  
**Provincial Rank:** S3                   **Global Rank:** G5  
**Observation: First:** 1986-06-26                   **Last:** 2004-07

**Occurrence ID:** 6159  
**Occurrence Class:** Vascular Plant  
**Occurrence Type:**  
**Occurrence Rank:** C - Fair estimated viability

**Provincial Legal Status:**

**Species at Risk Act Status:**

**COSEWIC Status:**

**General Description:**

S-facing slopes of prairie bluffs just S of Souris River above riverine woods Tufted Fairly frequent & scattered

**Occurrence Data:**

1986: fairly frequent and scattered 2004: a small population reported.

**Directions:**

Souris River Valley; Pinto/Souris IBP proposed Natural Area ca 3/4 mi N & 0.8-1.0 mi E of former Pinto Station ca 5.5 mi E & 0.5 mi N of Roche Percee (49 05'N 102 41'W) 49.08 102.68 NE1/4 Sec 36 T01 R06 W2

---

**Scientific Name:** *Asclepias verticillata*  
**Common Name:** Whorled Milkweed  
**Provincial Rank:** S1                   **Global Rank:** G5  
**Observation: First:** 2004- July                   **Last:** 2004-07

**Occurrence ID:** 15041  
**Occurrence Class:** Vascular Plant  
**Occurrence Type:**  
**Occurrence Rank:** C? - Possibly fair estimated viability

**Provincial Legal Status:**

**Species at Risk Act Status:**

**COSEWIC Status:**

**General Description:**

**Occurrence Data:**

SRC 2004 - species observed in 1 site.

**Directions:**

## Rare and Endangered Species Report

---

**Scientific Name:** *Dolichonyx oryzivorus*

**Common Name:** Bobolink

**Provincial Rank:** S4B,S4M      **Global Rank:** G5

**Observation: First:** 2015-05-26      **Last:** 2015-05-26

**Provincial Legal Status:**

**Species at Risk Act Status:**

**COSEWIC Status:** Threatened

**General Description:**

Breeding Bird Status: Probable Breeding; (2015)

**Occurrence ID:** 999978533

**Occurrence Class:** Vertebrate Animal

**Occurrence Type:**

**Occurrence Rank:**

**Occurrence Data:**

**Directions:**

---

**Scientific Name:** *Chrysemys picta bellii*

**Common Name:** Western Painted Turtle

**Provincial Rank:** S3      **Global Rank:** G5T5

**Observation: First:** 2015-06-14      **Last:** 2015-06-14

**Provincial Legal Status:**

**Species at Risk Act Status:**

**COSEWIC Status:** Not at Risk

**General Description:**

1 individual(s), (2015)

**Occurrence ID:** 999954574

**Occurrence Class:** Vertebrate Animal

**Occurrence Type:**

**Occurrence Rank:**

**Occurrence Data:**

**Directions:**

Souris River

# Rare and Endangered Species Report

---

**Scientific Name:** *Chrysemys picta bellii*

**Common Name:** Western Painted Turtle

**Provincial Rank:** S3

**Global Rank:** G5T5

**Observation: First:** 2015-06-14

**Last:** 2015-06-14

**Occurrence ID:** 999954575

**Occurrence Class:** Vertebrate Animal

**Occurrence Type:**

**Occurrence Rank:**

**Provincial Legal Status:**

**Species at Risk Act Status:**

**COSEWIC Status:** Not at Risk

**General Description:**

1 individual(s), (2015)

**Occurrence Data:**

**Directions:**

Souris River

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