

January 23, 2017

Ms. Tracey Braun
Environmental Approvals Branch
MB Sustainable Development
Box 80, 160-123 Main Street
Winnipeg, MB R3C 1A5

Dear Ms. Braun:

RE: Response to Provincial Information Requests on Project 4 – Environmental Assessment Report

Please find attached our response to the questions received from MB Environmental Approvals Branch on July 28, 2016. As of November 28, 2016, as directed by the Manitoba Government, Manitoba Infrastructure has taken over responsibility for the Manitoba East Side Road Authority. Manitoba Infrastructure has created a division called Remote Road Operations to manage the all-season road projects on the east side of Lake Winnipeg.

If you have any questions please contact myself or Jaime Clarke.

Sincerely,



for/ Mike Knight, Acting Director
Remote Road Operations
MK/jc

Attachment

cc: Ryan Coulter, Manager of Environmental Services, Manitoba Infrastructure
Lance Vigfusson, Interim CEO and Deputy Minister, Manitoba Infrastructure
Tracey Braun, Manitoba Sustainable Development

Project 4: All Season Road Connecting Berens River to Poplar River First Nation
Manitoba Sustainable Development (MSD) Information Requests

- 1. Please provide additional information regarding fish and mussel sampling methods referenced in Appendix 8-1 and include which lakes were included in the survey. (Manitoba Métis Federation)***

Fish Sampling:

Fish and mussel sampling gear type and results are presented in Appendix 4 of the Aquatic Environment Report found in Appendix 8-1 of the Environment Impact Statement (EIS). Fish sampling was completed with the use of gillnets for larger watercourses and electrofishing for smaller creeks. As explained in Chapter 8 Section 4.1.1.6 of the EIS, sampling methods were chosen based on specific site conditions. A multi-mesh index net, and a small mesh gang net were set for a 24 hour period in areas in close proximity to the proposed water crossing in the class 1 watercourse. Sampled areas fell within close proximity of the proposed road design. Transects were identified at the water crossing sites and net set locations were determined and recorded by field staff.

Electrofishing is generally considered the most effective means of capturing small fish in wadeable streams with structure. Given that cyprinids would not be undertaking migrations or notable movements during the sampling period fyke nets would be ineffective. Seines are ineffective in streams with soft bottoms, undercut banks and debris. Small mesh gill nets are appropriate for sampling small-bodied species in areas of no or low water velocity and were used as part of a standard index gang in all medium to large streams.

The objective of fish and mussel sampling was to provide a representation of species present during the sampling period to supplement existing information. Fish and mussel sampling was not intended to provide a quantitative description of species diversity and abundance at the site or in the study area. Existing information on fish and mussel distribution and habitat use from the area is sufficient to infer site specific use based on the habitat present. This type of information is sufficient to predict potential impacts from the road and to develop suitable mitigation.

No lakes have been identified within the project footprint and therefore were not sampled. The project maintains a 100m setback from watercourses along the proposed P4 All-Season Road alignment with the exception of crossing sites. However, field conditions (soil conditions, newly identified sensitive site, etc.) encountered during construction may dictate that the setback cannot be maintained. While this is an unlikely occurrence, the mitigation to address this unique situation is as follows: where a 100m setback is not obtainable, a buffer of undisturbed vegetation equal to 10m plus 1.5m times the slope gradient, or 30m whichever is great will be left between the road and adjacent waterbodies as recommended in the Manitoba Stream Crossing Guidelines.

Mussel Sampling:

"*Quadrula quadrula* occurs in a variety of habitats ranging from medium to large rivers..." (COSEWIC 2006). Given the uncertainty regarding the location of Mapleleaf Mussels, all medium to large rivers that cross the P4 alignment were sampled for mussels. Smaller tributaries were not sampled because they are unsuitable Mapleleaf habitat for the following reasons:

- Shallow water depths that are prone to ice formation to the creek bottom which would result in mortality;
- Fine substrates overlain by organic material (not suitable for Mapleleaf);
- Presence of barriers to fish movements, inhibiting access by Channel Catfish (host species); and
- Unsuitable habitat for Channel Catfish.

Mapleleaf Mussels were found in the Berens River; however the pier of the Berens River Bridge will be located on exposed bedrock outcropping at the east edge of the channel at the crossing, not in-water. Surveys of the Etomami, North Etomami and Leaf rivers did not identify the presence of Mapleleaf or any other mussel species and fish sampling did not identify the presence of Channel Catfish, the host species of Mapleleaf. Of these three rivers, a crossing structure that requires an in stream structure (pier) is only required at the Etomami River.

Where in-water work is required in suitable Mapleleaf Mussel habitat (i.e. medium to large rivers) and presence of Mapleleaf Mussels has not been identified, their presence/absence relative to the in-water work footprint will be confirmed prior to construction. Where Mapleleaf mussels have been identified within a waterbody designated for in-water work standard practice is as follows:

1. A Species at Risk Act (SARA) permit will be obtained through the SARA application process with Department of Fisheries and Oceans (DFO).
2. A qualified Fisheries Biologist will conduct a Mussel Salvage (See Annex 1 – EPP24 Mussel Salvage), where identified and cataloged Mapleleaf mussels will be relocated a minimum of 150 m upstream from the proposed in-water works based on Protocols described by G.Mackie, T.J. Morris, and D. Ming in the Protocol for the Detection and Relocation of freshwater Mussel Species at Risk in Ontario-Great Lakes Area.
3. Submit report to DFO. Construction will proceed once SARA permit criteria are satisfied, and DFO Authorization or Letter of Advice (LOA) is received for the work.

To verify the presence/absence of Mapleleaf Mussels prior to the construction of the Etomami River bridge, DFO will be contact to discuss SARA permitting requirements as well as survey, relocation, monitoring and reporting details. A qualified Fish Biologist will conduct the mussel survey and if Mapleleaf Mussels are found, they will be relocated, monitored and reported on in compliance with conditions of the SARA Permit obtained from DFO.

The following sections in Chapter 8 Aquatic Environment show the summary of potential construction, operation, and maintenance-related environmental effects on aquatic species at risk and their proposed mitigation measures:

- Table 8.8 Summary of Potential Construction-Related Environmental Effects on Fish Habitat and Proposed Mitigation Measures;
- Section 8.2.4.1 Fish Habitat, Fish and Harvested Fish and Aquatic Species at Risk
- Section 8.2.4.1.2 Operations and Maintenance Effects and Mitigation
- Section 8.2.4.3 Aquatic Species at Risk
- Section 8.2.4.3.1 Construction Effects and Mitigation
- Section 8.2.4.3.2 Operations and Maintenance Effects and Mitigation

2. Please provide an explanation of how baseline aquatic environmental studies considered the variability of the aquatic environment. (Manitoba Métis Federation)

The study effort is consistent with the potential level of impact from the proposed development based on current understanding of the effects of all season road stream crossings on the aquatic environment; potential aquatic impacts from roads are well understood. Additional baseline studies would provide little additional information upon which to base impact predictions or to select appropriate mitigation.

Details on aquatic monitoring processes can be found in the EIS in Chapter 8 Section 6.0, assessments of non-fish bearing stream crossing sites can be found in Chapter 8 Appendix 5, and the *Stream Crossing Assessment Summaries* including morphology, site condition, and fish presence can be found in Chapter 8 Appendix 6. Prediction of potential adverse effects of construction within these watercourses can be seen in *Impacts to Fish and Fish Habitat*, within the *Stream Crossing Assessment Summaries*, Chapter 8 Appendix 6.

The aquatic baseline studies have considered many aspects of the potential changes in aquatic environments. The majority of the watercourse will have variability in water quality, vegetation, physical parameters, and fish presence associated with seasonal changes. This variability such as vegetation re-growth, water chemistry, flow rates, and fish presence can be predicted based on known life cycle patterns for the region. The valued environmental components (VEC) approach as indicated in Appendix 8-1 Section 4.2, describe the potential effects to the habitat based on spatial and temporal criteria.

3. Please provide additional information regarding the rationale for using gill nets and electrofishing methods for assessing fish communities. (Manitoba Métis Federation)

The objective of fish sampling was to provide a representation of species present during the sampling period to assist in describing potential fish use. Electrofishing and gillnetting were determined to be the most effective methods of sampling fish at the sites given the objectives of the surveys and the conditions at the time of the surveys. Electrofishing is generally considered the most effective means of capturing small fish in wadeable streams with structure. Given that cyprinids would not be undertaking migrations or notable movements during the sampling period fyke nets would be ineffective. Seines are ineffective in streams with soft bottoms, undercut banks and debris. Small mesh gill nets are appropriate for sampling small-bodied

species in areas of no or low water velocity and were used as part of a standard index gang in all medium to large streams.

4. Please provide details regarding the design of minimum setback for bridge abutments. (Manitoba Métis Federation)

Bridge abutments are constructed based on structural design drawings. The location of the abutments and their setback from the watercourse will be determined on a case-by-case basis depending on final structural design plans approved by an engineer. The final design phase will confirm the final bridge designs (clear span, two-span, three span) and proximity of abutments to the high water mark. Generally, the abutments are designed with a footing which does not fall below the Q2 (normal two (2) year high water mark). In some occasions design limitations may require the abutment footprint to be installed below Q2 (in-water), in which case the project would be discussed with DFO and special provisions can be taken (i.e. concrete is set prior to exposure to water).

5. Please provide additional information to address concerns regarding the absence of a multi-season vegetation survey. (Manitoba Métis Federation)

Traditional vegetation surveys were completed in the project assessment area in 2015 to identify and tabulate all observed vascular species including trees, shrubs, forbs and graminoids. The surveys that were conducted allowed for the identification of community types in the assessment area, both upland and wetland. Multi-season vegetation surveys are not required to delineate community types, as community types tend to be represented by dominant vegetation species. Detailed vegetation surveys were conducted at several sites with confidence along the entire route for the proposed all-season road.

Surveys for species of conservation concern were also conducted in 2015 (June) to record any early season rare plants. Searches concentrated on uncommon plant communities and unusual habitats and landscape features. Although species of conservation concern were observed during field studies for the project, no species listed by the Manitoba Endangered Species and Ecosystems Act (MESEA), the federal Species at Risk Act (SARA), or the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) were observed. Vascular species at risk were not expected to occur as the assessment area is beyond the range for these plants.

Multi-season surveys are more commonly conducted for rare plants and may be required in areas for reasons such as the following: longer growing seasons, climatic fluctuations, flowering time, plant identification, and known rare plant occurrences. Since no species of concern listed by MESEA, SARA, nor COSEWIC were expected to occur, multi-season surveys were not conducted. Confidence is expressed in the accuracy and timing of surveys for species of conservation concern in the project assessment area for the proposed all-season road.

6. Please provide additional information regarding the restoration of quarry and borrow sites, temporary staging areas, and work camps. (Manitoba Métis Federation and Eastern Region)

The decommissioning and reclamation of quarry and borrow sites, temporary staging areas and work camps will be completed in accordance with Manitoba Sustainable Development (previously Manitoba Conservation) Environment Act Licence and Work Permits received for the work. ESRA also has Environmental Protection Procedures (EPPs) for borrow pit decommissioning (EPP19), quarry site selection and requirements (including decommissioning phase) (EPP20), and temporary site (including work camps) decommissioning (EPP23) (Annexes 2, 3, and 4 respectively).

7. Please provide locations of all known quarry and borrow sites, temporary staging areas and work camps and provide a description of timing operations and set back distances to sensitive sites. (Manitoba Métis Federation, Wildlife and Fisheries Branch, and Eastern Region)

Possible locations for quarry sites can be found within Appendix 3-3 of EIS. Information on quarry selection, with regard to proximity to fish habitat, can be found in the EIS:

Chapter 4 - Aboriginal and Public Engagement:

- Section 4.4 Additional Engagement Information;
- Section 4.7 Future Engagement Activities;

Chapter 5 - Environmental Protection and Sustainable Development:

- Section 5.4.1 Contract Specifications;
- Appendix 5-3 Environmental Protection Procedures:
 - EPP14.0.12 Wildlife;
 - EPP6.4.1 Working Within or Near Fish Bearing Waters;
 - EPP20 5.2 Quarry Site Selection and Requirements;
- Appendix 5-4 GR130s Environmental Protection Specifications:
 - GR130.8.5 Designated Areas and Access;
 - GR130.9.2.5.9 Petroleum Handling and Storage;
 - GR130.15.1.1 Working Within or Near Water – General;
 - GR130.15.1.2 Working Within or Near Water – General;
 - GR130.15.1.3 Working Within or Near Water – General;
- GR130.15.1.5 Working Within or Near Water – General;
 - GR130.15.1.7 Working Within or Near Water – General;
 - GR130.15.1.9 Working Within or Near Water – General;
 - GR130.16.7 Erosion and Sediment Control;
 - GR130.16.11 Erosion and Sediment Control; and

Chapter 7 - Physical Environment:

- Section 7.2.4 Effects on Surface Water, Air Quality and Noise

The all-season road alignment and the selection of quarry sites, considered appropriate buffers from cabins, camps, residences, and First Nations reserve lands. The location of potential quarries was reviewed with the communities/trappers to minimize interference with important areas within individual traplines. Figure 10-11 in Chapter 10 of the EIS shows the registered

traplines in the local assessment area. Additional information on the protection of traplines can be found in Chapter 5 of the EIS, Appendix 5-3 Environmental Protection Procedures and Appendix 5-4 GR130s Environmental Protection Specifications:

- EPP1 4.0 Wildlife;
- EPP20 5.2 Quarry Site Selection and Requirements;
- EPP21 4.0 Site Selection – Temporary Works; and
- GR130.17.3.3 Clearing and Grubbing.

EPP20 5.2.1 Quarry Site Selection and Requirements found in Chapter 5, Appendix 5-4 of the EIS indicates that no quarry is to be established closer than 150 m from a residence (home or cabin). This requirement is also found in *Manitoba Mines and Minerals Act*, section 40(1). First Nation Reserve lands are shown in relation to quarries in Chapter 3, Figure 3-6 Potential Construction Quarry Sites of the EIS. The closest residence within Poplar First Nation reserve land to a potential quarry site is 2.3 km away. The closest residence within Berens First Nation reserve land to a potential quarry site is 6.6 km away. The nearest potential quarry location (Quarry 31) is 6.0 km from the closest cabin.

Quarry sites were selected so as to not interfere with areas of importance (heritage resources, cultural sites) and appropriate setbacks have been applied in consultation with communities and Manitoba Heritage Resources Branch. Additional information for quarry selection, with regard to proximity to heritage resources, can be found in Chapter 5 of the EIS:

- Appendix 5-3 Environmental Protection Procedures:
 - EPP13 4.1-4.3 Heritage Resources;
 - EPP20 5.2, 5.4.3 Quarry Site Selection and Requirements; and
- Appendix 5-4 GR130s Environmental Protection Specifications:
 - GR130.18.1-GR130.18-3 – Heritage Resources.

The quarries that are selected for development will be selected based on need, quality of material, and accessibility with consideration of criteria identified in EPP20 Quarry Site Selection and Requirements, Chapter 5 Appendix 5-3 Environmental Protection Procedures in the EIS. Once detailed design is complete and the amount of material available from within the road bed and ditches, (cut and fill balance estimate) the remaining material that will be required from quarries will be known. Materials for construction of the road that are required over and above this will be sourced from quarries.

Location of construction camps and staging areas will be defined based on operational requirements during construction, with consideration of the criteria identified in EPP21 Site Selection - Temporary Works, found in Chapter 5, Appendix 5-3 Environmental Protection Procedures of the EIS.

Avoidance mitigation measures (e.g., timing of activities) for bird species, aquatic species, and wildlife species are listed in the EIS in Chapter 9, Appendix 9-7 *Terrestrial Species at Risk in the Local Assessment Area* and Chapter 8, Table 8.7 *ESRA's Protection Procedures and Specifications*

for Fish Habitat, Fish and Harvested Fish and Aquatic Species at Risk. Mitigation measures are explained explicitly in Chapter 8, Section 8.2.3, and Chapter 9, Section 9.2.3 of the EIS.

8. Please provide additional information regarding how the winter road alignment will be regenerated and how monitoring will be implemented to ensure habitat gain is achieved as predicted in the EIS. (Eastern Region)

These questions were addressed during the meeting with Environment Canada on June 21, 2016. With regard to providing scientific evidence to support the assertion that decommissioned winter road will be suitable woodland caribou habitat, by 2020, portions of the winter road will no longer be operational. The predominant vegetation cover type intersected by the winter road consists of low-height fen and bog vegetation. Little regeneration of vegetation on the winter road (regrowth of forbs and sedges) is required for use of the winter road by caribou. Furthermore, because there is little differentiation between surrounding vegetation, and vegetation along the winter road itself, once no longer operational the disturbance buffer of 500m along the winter road is no longer applicable, and therefore, all of the area within 500m of the winter road becomes useable habitat.

Vascular plants, lichen and bryophytes are expected to return to decommissioned winter roads within 5 years, as noted in Section 6.1 Methods of the Wildlife Technical Report (Chapter 9, Appendix 9-1 of the EIS). Conifer species would be expected to re-establish within 5 years, but may take several years to reach mature canopy height. Where vegetation has been removed, plants will begin to re-establish as soon as the year after the winter road is no longer in use.

Map 07, the Land Cover Classification in the Local Project Study Area of the Wildlife Technical Report (Chapter 9, Appendix 9-1 of the EIS) shows the land cover classification in the area surrounding the Project RAA. As shown, the majority of the winter road traverses fen and bog (wetland - shrub and wetland – herb) cover types. These land cover classes closely coincide with current summer core use and calving areas for caribou shown in map S-04, submitted to Environment Canada on June 17, 2016. Further, Map 9 Caribou Predicted High Quality Calving Habitat for Project 4 Study Area of the Wildlife Technical Report shows that substantial tracts of predicted high quality calving habitat exist along the current winter road alignment. Again, this area correlates with bog and fen cover types.

This scientific evidence demonstrates that caribou in this region utilize open habitat complexes. As the road is decommissioned, habitat is expected to regenerate as discussed in Section 6.1 Methods of the Wildlife Technical Report (Chapter 9, Appendix 9-1 of the EIS) and Annex 5 - Bloodvein Vegetation Recovery Assessment Report. Re-establishment of vascular plants, grasses, forbs, and shrubs is anticipated within a few years. Slower regeneration times for conifer species are not anticipated to affect habitat use as natural canopy cover in these areas is very limited. The Bloodvein Vegetation Recovery Assessment determined within 5 years of winter road closure tree species regeneration was up to 25%, including black spruce, jack pine, tamarack as well as deciduous species. Herbaceous cover has regenerated quicker than tree species although tree species regeneration is expected to gradually increase annually at a rate that is considered normal. This has been further summarized in Annex 5 – Bloodvein Vegetation Recovery Assessment Report.

The decommissioning of the winter road will be done in accordance with our Environmental Protection Procedure 22 – Winter Road Closure and Reclamation Plan (Annex 6). A field assessment will be conducted in peak summer (July/August) on sections of decommissioned winter road, 5 years post decommissioning to document regrowth and tree sapling establishment.

9. Please provide additional information to address concerns regarding the impact of the project on Flooded Jellyskin. (Manitoba Métis Federation)

As stated within Chapter 9, Appendix 9-4, Section 4.2.2 (Species of Conservation Concern and Other Species of Note) Flooded Jellyskin (*Leptogium rivulare*) lichen is listed as threatened by the Species at Risk Act and as a species of special concern by the Committee on the Status of Endangered Wildlife in Canada but was not observed during field studies.

Flooded jellyskin grows on periodically inundated surfaces, and is usually found on the bark of deciduous trees (e.g., ash, red maple, silver maple, American elm), along the banks of ponds and waterways, and in swampy forests that flood annually in the spring (Government of Canada 2016). According to the Environment Canada Recovery Strategy for the flooded jellyskin lichen, rocky shorelines of permanent lakes were identified as critical habitat for the eight extant populations in Manitoba. While 15 critical habitat locations have been identified in northwestern Manitoba (Environment Canada 2013), all are outside of the regional assessment area for the P4 All-Season Road Project.

Detailed descriptions of mitigation measures, in the event that a species at risk discovery occurs are listed in Appendix 5-3 Environmental Protection Procedures and Appendix 5-4 GR130s Environmental Protection Specifications of the EIS:

- GR130.17.1.5 Clearing and Grubbing General: A vegetation buffer shall be maintained between the Right-of-Way and sensitive features including, but not limited to, sticknests, mineral licks, dens, and heritage sites as outlined in the Forest Management Guidelines for Terrestrial Buffers.
- GR130.17.2.2 Clearing: Any new sensitive areas found during clearing must be reported to the Contract Administrator and are not to be cleared.
- Environmental Protection Procedure (EPP) 1, 4.0.4: The Contract Administrator will take into account required buffers, and sensitive areas.

Chapter 5 also outlines the environmental protection and management plans that will be implemented for the Project. ESRA has developed a series of Environmental Protection Specifications (e.g., General Requirements 130 [GR130s]) that are distributed to contractors as part of the contract agreements for clearing and construction works. These plans and specifications will provide information on the appropriate terrestrial environment mitigation methods and environment protection measures to be used before, during and after the works. The environmental protection and management plans will incorporate applicable provincial and federal management plans for vegetation (including wetland areas and introduced species), wildlife and Species at Risk, as well as applicable provincial and federal regulations, acts and

guidance. The environmental protection and management plans will include the designation of areas important to local wildlife and Species at Risk (e.g., dens, mineral licks), as well as areas important to local communities for food, medicine, cultural and spiritual purposes, as Environmentally Sensitive Sites to be protected during the construction and operations and maintenance of the Project.

10. Please provide clarification regarding the rate of traffic during construction and during operation (Manitoba Métis Federation)

Since the winter road and all-season road are not co-located, traffic will be limited during construction to construction and employee vehicles only.

Due to a formatting error, the Geometric Design Criteria (GDC) outlined in Chapter 3, Table 3.1 in the EIS is missing a second row which should read: "Predicted Average Annual Daily Traffic" of <500. This text error was incorrectly carried through to Chapter 7, Section 7.2.4.2 Operations and Maintenance Effects and Mitigation (Air Quality) and Chapter 10, Section 10.2.4.5.2 Operations and Maintenance Effects and Mitigation (Human Health and Safety) in the EIS should be interpreted as an Average Annual Daily Traffic of <500. The evaluation of effects is based on the operational average annual daily traffic of <500.

11. Given the remote nature of the project, please provide a description of the emergency resources and measures available in the event of an accident involving personal injury during construction and operational phases of the Development. (Environmental Approvals Branch)

Traffic and access to worksites will be limited during construction to construction and employee vehicles only.

Safety requirements for construction can be found within the General Requirements 140 [GR140s]. According to GR140.4.4, during construction phases, the Contractor shall be solely responsible for workplace safety and health at the site and at any other locations where the Contractor's workers or Sub-Contractors undertaking the work. The Contractor is also responsible for compliance with all laws, rules, regulations, and practices required by the applicable construction and workplace safety legislation.

Under GR140.5 (found in Chapter 5 Appendix 5-5), the contractors will be required to submit a Safe Work Plan to the proponent for review and approval prior to initiating the work on the Project. The safe work plan must include emergency response plans prepared for personal injury, fires, explosions and spills (GR140.15.5) including information on project location of work, work activities and hazards, safe work procedures, emergency contacts, and on-site emergency responders and equipment. During construction, safety plans must include emergency evacuation procedures in the event of forest fires or any major weather event as per GR140.5 Safe Work Plan. Additional information on wildfire evacuations can be found within GR130.20.1 Wildfires. All-Season road maintenance contracts will have the same safety requirements as the construction contracts.

During the operational phase emergency resources and measures will be the responsibility of the traveler.

12. Please provide information regarding how the final route alignment was selected in consideration of input from Eastern Region and Wildlife and Fisheries Branch, and the rationale for not locating the northern portion of the route 5 km from the Poplar River, to mitigate impacts to moose while also avoiding negative effects to caribou. (Eastern Region and Wildlife and Fisheries Branch)

As stated in Section 2.2.2 *Road Route Alignment* in Chapter 2 of the EIS, routing options for Project 4 were first identified as part of the East Side Large Area Transportation Network Study. This study utilized the best available information at the time and considered several factors, including traditional knowledge, public and First Nations community input, and wildlife information.

As stated in comments provided by Manitoba Sustainable Development's (MSD) Eastern Region, ESRA (now RRO) met regularly with the regional IRMT to present updates on routing and addressed questions and concerns regarding the routing options. All exploratory clearing performed along the proposed alignment was conducted under permit issued by Manitoba Sustainable Development.

MSD is correct in its understanding that ESRA's geotechnical investigations were required to confirm the proposed alignment's capacity to support road construction, and that this certainty was required in order to properly assess effects of the Project. MSD Eastern Region is also correct in its statement that ESRA developed alternate routing options where possible in response to input received from First Nation communities, where modifications resulted in the current alignment. Many of these re-alignments were possible because they did not create further environmental or engineering issues.

As has been discussed with the Eastern Region IRMT and the Wildlife and Fisheries Branch on several occasions, moving the road further from the Poplar River presents many engineering and constructability issues and would likely increase the overall project footprint by requiring construction materials to be sourced and processed further from the road. This in turn would require additional access roads, further clearing and overall increased disturbance and Project effects. Further review of wildlife information which was also provided to MSD Wildlife and Fisheries Branch would suggest that relocating the road a minimum of 5km from the Poplar River may in fact not mitigate potential project effects to caribou and moose as much as may be thought.

While a relocated alignment 5 km from the Poplar River would not intersect caribou summering and wintering areas identified through ESRA's caribou collaring studies, it risks interfering with potential caribou calving habitat. As per Map 09 in Appendix 9-1 *Wildlife Technical Report* of the EIS, moving the alignment further south and away from the Poplar River would cause increased intersect of predicted caribou calving habitat and could further increase potential project effects

to caribou in the region. Similarly, as shown in Map S-06 (Confidential) provided as part of a supplemental mapping compendium to MSD Wildlife and Fisheries Branch Eastern Region on June 17, 2016, moving the road further from the Poplar River would not result in avoidance of known moose use areas (IE 70% kernel density of observed moose). Additional maps provided to MSD Wildlife and Fisheries Branch Eastern Region on January 23, 2017 under confidential cover show that an alignment located 5 km from the Poplar River remains in both caribou and moose core use areas and would intersect more potential caribou calving habitat than the current proposed alignment.

The proposed alignment represents the best available option when all environmental, social, traditional, and engineering factors are considered.

13. Please provide additional information to address comments regarding the effects assessment of wildlife? (Eastern Region)

As per Chapter 6 of the EIS, *Environmental Impact Assessment Scope and Approach*, the assessment of potential adverse effects of the project to the existing environment was conducted in a manner consistent with standard methods for environmental impact assessment. Since the Project 4 EIA would undergo federal review, the EIA was structured in accordance with methods prescribed by the Canadian Environmental Assessment Agency (CEAA). The effects assessment considered the residual adverse effect after mitigation and evaluated significance using key criteria provided by Canadian Environmental Assessment Agency to ESRA for this Project: duration, magnitude, extent, frequency, reversibility and ecological context. As per Section 6.4.5 *Determining Significance of Residual Effects* in Chapter 6 of the EIS, definitions for these criteria were developed based on the CEAA comprehensive study report for ESRA's Project 1 as well as from review of other recent environmental impact statements.

The assessment of effects presented in the EIS is based on information collected and obtained to date. As identified in Chapter 14 *Monitoring and Follow-Up*, ESRA (now RRO) may conduct post-construction monitoring for caribou, moose and furbearers, as necessary, to document whether predicted effects are occurring and whether mitigation measures are performing as intended. Post-construction monitoring methods will be developed with input from MSD and detailed in a Wildlife Monitoring Plan for the Project. Should an unexpected or unanticipated effect to caribou, moose or furbearers be detected during monitoring and follow-up studies, adaptive management strategies to further mitigate the effect will be developed in discussion with regulatory authorities and implemented as required.

14. Which caribou HSI model is being referenced in Section 2.2.2.1.? (Eastern Region)

The Woodland Caribou Habitat Suitability Index (HSI) Model referenced within Section 2.2.2.1 was developed by Palidwor and Schindler (1995) in cooperation with the Manitoba Forestry/Wildlife Management Project and Manitoba Natural Resources (now Manitoba Sustainable Development) Eastern Region.

15. Please provide additional bird and den survey information prior to road construction in consultation with Eastern Region and Wildlife and Fisheries Branch. The results of this information must be considered in the development of the mitigation and monitoring plans to be submitted for approval prior to construction. (Wildlife and Fisheries Branch)

ESRA (now RRO) has conducted adequate baseline wildlife surveys to document and describe the existing environment, including avian species and other environmentally sensitive sites, such as stick nests and mineral licks in the vicinity of Project 4. As per ESRA's GR130s, bird nests are not anticipated to be affected by clearing activities. Pre-clearing nest surveys (if required) would be conducted should clearing be required between April 1 and September 1, and clearing would only proceed if survey results find that the activity would remain compliant with the Migratory Birds Convention Act, 1994, the Species At Risk Act, the Manitoba Endangered Species and Ecosystems Act and the Manitoba Wildlife Act.

Supplemental technical papers for amphibians, birds and trail camera studies have been produced and provide additional information on ESRA's baseline biophysical studies. These address questions from Eastern Region and Wildlife and Fisheries Branch and were provided to MSD Wildlife and Fisheries Branch on January 18, 2017.

Additional surveys are required prior to construction. Manitoba Infrastructure has committed to pre-clearing surveys during sensitive periods, if required, and has identified monitoring and follow-up for wildlife in Chapter 14 *Monitoring and Follow-Up*. As stated in Appendix 5-3 *Environmental Protection Procedures* and Appendix 5-4 *GR130s Environmental Protection Specifications* of Chapter 5 in the EIS, should clearing be required between April 1 and September 1 of any given year it will be preceded by a survey to ensure compliance with the Migratory Birds Convention Act, 1994, the Species At Risk Act, the Manitoba Endangered Species and Ecosystems Act and the Manitoba Wildlife Act.

16. Please provide additional information to address MMF concerns related to the socio-economic effects of the project on the local Métis community, as it relates to hunting, fishing, gathering and trapping, and include a discussion of how any identified impacts will be mitigated. (Manitoba Métis Federation)

The project area is not within the recognized Métis harvesting area under the 2012 Harvesting Agreement between Manitoba and the MMF. While there may be a few individuals that identify as Métis in the project area Project TK studies, MMF land use and occupancy studies, and Indian and Northern Affairs Canada map *Métis Identity Population in Manitoba* (2006) all indicate that no resident Métis communities or active MMF locals exist in the project area. While the MMF asserts that the Métis hold Aboriginal rights in the east side area, including in the Berens River and Poplar River areas, the government considers the claims to rights in this area by the Métis to be weak, because of limited use prior to effective European control.

As stated in Chapter 10's mitigation section (10.2.3), the design and routing of the proposed All-Season Road was developed in conjunction with Elders, elected officials and community members of Berens River First Nation, Berens River NAC, Poplar River First Nation, and based on

input provided by the MMF. As a part of ESRA's Aboriginal and Public Engagement Program, during the Project 4 EIS process, ESRA met with MMF to obtain their input on environmental effects of the proposed project. The only specific comments raised were related to the protection and preservation of heritage resources; non-specific concerns were raised with respect to harvesting. More specific concerns were identified in MMF's review of Project 1 EIA and the MMF TLUK study report. For MMF comments relating to the P4 Project please see Appendix 4-9 *Project Comments from Manitoba Métis Federation and ESRA Responses* found in Chapter 4 in the EIS.

The concerns raised by MMF were similar to those identified by the local communities, and mitigation measures outlined in the EIS would apply to both Métis and First Nation groups. Several mitigation measures have been identified to protect the environment and avoid effects to resource users as discussed in Chapter 10 of the EIS. While these measures were developed with specific and direct discussions with local First Nations, they would also apply to any Métis resource user.

References

Palidwor, K.L., and D.W. Schindler 1995. Terrestrial and Aquatic Environmental Managers Inc., Version 2 Habitat suitability index models within the Manitoba Model Forest Region: Woodland Caribou (*Rangifer tarandus caribou*). A document prepared for the Manitoba Model Forest Inc., March 1995.

Annex List

ANNEX # (in order of appearance in IRs)	Document Title
1	EPP 24 – Mussel Salvage
2	EPP 19 – Borrow Pit Decommissioning
3	EPP 20 – Quarry Site Selection and Requirements
4	EPP 23 – Temporary Site Decommissioning
5	Bloodvein Vegetation Recovery Assessment (Memo)
6	EPP 22 – Winter Road Closure and Reclamation Plan

Annex 1

**ENVIRONMENTAL
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Mussel Salvage

Revision September 2016

1.0 Description

- .1 Mussel survey and if necessary salvage and relocation shall be undertaken as instructed by the East Side Road Authority (ESRA) in advance of various activities, including bridge construction, temporary water crossing structures, spawning shoals or spurs, and/or culvert installation in fish bearing waterways. The Contractor is responsible for ensuring compliance with contract specifications, environmental legislation, permits and authorizations.

2.0 Purpose

- .1 The purpose of this procedure is to ensure that mussel survey, salvage and relocation are conducted in accordance with applicable environmental legislation, regulations, guidelines, permits and contracts.

3.0 Legislation and Supporting Documents

- ESRA Contracts and Associated Documents
- Applicable Manitoba Conservation Work Permits
- Applicable Fisheries and Oceans Canada (DFO) Authorizations
- Potentially a Species at Risk (SAR) Permit
- Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat
(www.gov.mb.ca/waterstewardship/fisheries/habitat/sguide.pdf)
- Freshwater Intake End-of-Pipe Fish Screen Guidelines – Department of Fisheries and Oceans 1995 (www.dfo-mpo.gc.ca/Library/223669.pdf)
- Protocols for Detection and Relocation of Freshwater Mussel Species at Risk (Mackie et al. 2008) (<http://www.dfo-mpo.gc.ca/Library/332071.pdf>)
- Environmental Protection Guidelines – Appendix 7.1 of PR 304 to Berens River All-Season Road Environmental Impact Assessment – August 2009
- Best Management Practices – Appendix 7.2 of PR 304 to Berens River All-Season Road Environmental Impact Assessment – August 2009
- Species at Risk Act, S.C. 2002 c.29
- Fisheries Act R.S.C., 1985, c. F-14

4.0 Procedures

Prepared by: C. McDermid	Revision Number 1.0	Date Issued: September 2016
Approved by		Date of Revision
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1. Permits

1. Mussel Salvages shall be conducted to remove mussels from in-water footprints of project components.
2. Necessary permits shall be obtained prior to conducting any in-water mussel work.
 - i. Mussel salvage and relocation work shall be conducted under and in accordance with a live fish handling permit obtained from MB Sustainable Development.
 - ii. Where a species at risk (SAR), as listed under Schedule 1 of the Species at Risk Act is known to occur, resides in the waterbed, work shall also be conducted under and in accordance with a species at risk (SAR) permit obtained from Department of Fisheries and Oceans (DFO). SAR permit application can be found online at: http://www.dfo-mpo.gc.ca/species-especies/permits-permis/pdf/SARA_permit_application-eng.pdf .
3. Mussel survey and salvage operations shall be conducted by a qualified biologist:
 - i. Mussels captured during the survey will be identified and transported while submerged to a designated location with similar habitat an appropriate distance upstream from the construction work site. (minimum 250 m)
4. Fish and mussel handling best practices shall be followed to reduce serious harm to mussels or mussel habitat.
5. If a SAR is found in a new area:
 - i. Stop work, inform DFO and obtain SAR permit prior to continuing work
6. Riparian habitats shall be restored to original pre-work condition;
7. Applicable measure in *Protocols for detection and relocation of freshwater mussel Species at Risk (Mackie et al. 2008)* including:
 - i. Preserve SAR listed mussels which are killed or mortally injured in 95% ethanol and supply to DFO as per permit requirement.
8. Mussel survey's, salvage and relocation activities and results shall be documented in a report is to be generated by a fish biologist and submitted to ESRA for review and approval.
9. The report shall contain detailed; descriptions, photos, and drawings of site conditions including;

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- i. Location, habitat profile, description of methodology including names of collectors, contact information, organization, and schedule of activities.
 - ii. Results including photos, depths, locations, substrate each animal was found, numbers and types of species found.
10. For mussel surveys conducted under a SAR permit there is a requirement to report to a DFO –Species at Risk Biologist. The report has to be detailed, thorough and contain a Fish and Mussel data collection table.
11. Any death of a listed SAR Mussel during the Salvage operation or associated construction must be reported immediately to a Species at Risk Biologist.
12. Any circumstance during the Mussel salvage or associated construction which has lead to the serious harm to fish (including any mussel) or a part of a commercial, recreational, or aboriginal fishery or deposit of deleterious substance in waters with potential fish presence the fish biologist/contractor shall report information to ESRA for submission to DFO under section 38(4) and 38(5) *Duty to Notify*.
13. Where required ESRA will submit reports to DFO.

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Annex 2

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BORROW PIT DECOMMISSIONING

December 2015

1.0 Description

- .1 The excavation of a borrow pit shall be undertaken in areas outlined by the Contractor, Contract Administrator or by the East Side Road Authority (ESRA), and consist of the excavating of material, other than Solid Rock.
 - .2 The decommissioning of borrow pits shall include the removal or disposal of all site debris, appropriate sloping of borrow pit sides, removal of site access, and promoting of natural re-establishment of vegetation. The Contractor is responsible for ensuring compliance with all contract specifications, environmental legislation, permits and authorizations.
-

2.0 Purpose

- .1 The purpose of this procedure is to ensure that borrow pit decommissioning operations are conducted in accordance with applicable environmental legislation, regulations, guidelines, permits and contracts.
-

3.0 Legislation and Supporting Documents

- ESRA Contracts and Associated Documents
 - Applicable Manitoba Conservation Work Permits
 - The Manitoba Conservation Brush Disposal Guidebook – March 2005
 - The Manitoba Stream Crossing Guidelines for the Protection of Fish Habitat – May 1996
 - Environmental Protection Guidelines - Appendix 7.1 of PR 304 to Berens River All-Season Road Environmental Impact Assessment – August 2009
 - Fisheries Act (R.S., 1985, c. F-14)
 - The Manitoba Conservation Forest Management Guidelines for Terrestrial Buffers – 2010-2015
 - Manitoba Infrastructure and Transportation Standard Construction Specifications for Grading – January 2008
-

4.0 Procedures

4.1 Clearing and Grubbing

- .1 Where clearing and grubbing is required, it shall be completed prior to excavation of the borrow pit.

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- .2 Clearing and grubbing shall be limited to the site and associated access routes.
- .3 Clearing and grubbing shall only be undertaken between September, 1 of any year and April, 1 of the following year.
- .4 All clearing and grubbing operations shall occur in accordance with the Clearing and Grubbing Environmental Protection Procedure (EP1).

4.2 Brush Disposal

- .1 Disposal of cleared trees and brush must be done as directed or approved by the Contract Administrator. Disposal may involve burning, compacting, burying, windrowing and compacting, limbing and chipping.
- .2 All cleared vegetation and debris that is to be burned shall be piled and compacted in windrows. Windrows shall be compacted to lie as close to the ground as possible (maximum height of 0.6 of a meter) and shall be no closer than 1 meter to the bush line. Burn piles shall be located a minimum of 15 meters from other wood and brush piles and standing timber.
- .3 Merchantable wood that is identified by the Contract Administrator shall be stockpiled outside and immediately adjacent to the clearing limits. Stockpile sites shall be located within existing clearings or areas of non-merchantable timber. Stockpile sites shall not be located within 100 meters of a waterbody. Unless otherwise specified, all stockpiled material shall be removed from Crown land by April 30 following the date of issuance.
- .4 The burning of debris piles is not permitted in the spring or early summer to avoid disturbing small wildlife species which may have young in the piles or may have prepared nesting sites. The best and preferred option for wildlife is burning in the fall or winter.
- .5 No burning of debris piles shall occur on deep organic soils. Piles shall be a minimum of 15 meters away from standing timber and the high water mark of any waterbody.
- .6 Slash shall be piled in a manner that allows for clean, efficient burning of all material. Avoid mixing soil into the slash.
- .7 The Contractor shall obtain a burning permit for open fires between April 1 and November 15. Burning between November 16 and March 31 does not require a burning permit; however, the supervising officer shall be advised prior to any burning. All fires shall be completely extinguished by March 31
- .8 Ensure safety precautions are taken to keep the fire under control. Burn piles shall be monitored, to ensure that subsequent fire hazards

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are not present. Upon completion of the burn, burn piles shall be completely extinguished.

- .9 All occurrences of fire spreading beyond the debris piles shall be reported to the Contract Administrator and the Natural Resources District Supervisor.
- .10 All brush disposal operations shall occur in accordance with the Clearing and Grubbing Environmental Protection Procedure (EP1).

4.3 Borrow Pit Sloping

- .1 The borrow pit excavation shall be conducted as uniformly as possible to the depths and within the limits outlined by contract specifications, environmental legislation, permits and authorizations.
- .2 Upon excavation completion, stockpiled stripping shall be placed uniformly over the slopes and bottom of the borrow pit.
- .3 Side slopes shall maintain a slope of 4:1, unless otherwise permitted or directed.
- .4 Upon completion of the borrow pit excavation, the Contactor shall cap, level and trim the borrow pit prior to decommissioning the area. If burying woody debris, the area shall be capped with ½ metre of clay. Stockpiled topsoil shall be spread to promote natural re-establishment of vegetation.

4.4 Access Road Removal

- .1 The temporary access road to the borrow pit, and any equipment brought onto site, shall be removed or blocked as soon as possible following completion of the work or when it is no longer required.
- .2 Following the removal of the temporary access road, the site shall be restored as per section 4.3.4.

4.5 Re-Vegetation

- .1 Borrow pits will be left in a manner which promotes natural re-vegetation of the site.
 - .1 In cases where seeding is required, and when conditions permit, it shall commence immediately upon completion of capping and trimming operations. When conditions do not permit immediate seeding, ESRA will endeavor to ensure seeding is completed within the next growing season.
 - .2 Seeding operations shall not be carried out under adverse conditions of high winds, or ground covered with snow, ice, or standing water.

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Annex 3

**ENVIRONMENTAL
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**Quarry Site Selection and
Requirements**

January 2017 Revision

1.0 Description

1. This procedure specifies best management practices for the selection of quarry sites and quarry development.
-

2.0 Purpose

1. The purpose of this procedure is to outline criteria for site selection of quarries and their development.
-

3.0 Legislation and Supporting Documents

- Manitoba Infrastructure – Remote Road Operation (MI-RRO) Contracts and Associated Documents
 - Previous East Side Road Authority (ESRA) Contracts and Associated Documents
 - The Mines and Mineral Act C.C.S.M. c. M162
 - Quarry Minerals Regulations 1992 M162 — R.M. 65/92
 - The Fires Prevention and Emergency Response ACT CCSM. c. F80
 - The Forest Act CCSM. c. F150
 - The Wildfires Act CCSM c. W128
 - The Workplace Safety and Health Act – CCSM. c. W210
 - The Dangerous Goods Handling and Transportation Act CCSM. c. D12
 - Applicable Manitoba Sustainable Development Work Permits
 - Environmental Protection Guidelines – Appendix 7.1 of PR 304 to Berens River All-Season Road Environmental Impact Assessment – August 2009
 - Explosives Act R.S.C., 1985, c. E-17
-

4.0 General

.1 General

- .1 The Contractor is to comply with all legislation, licences, authorizations and permits respecting the Project.
 - .2 This quarry site selection and requirements procedure is to be read in conjunction with GR140.33 Quarry, GR140.34 Crushing, GR140.35 Drilling, GR140.36 Blasting, GR140.37 Magazine Licence and Explosive Storage, GR140.38 and .39 Explosive Transportation.
-

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5.0 Procedures – Site Selection Criteria

.1 Site Selection

All proposed quarries are subject to a site selection analysis by Manitoba Infrastructure – Remote Road Operations to confirm that the proposed quarry site will not interfere with sensitive features including heritage resources and known cultural sites; sensitive wildlife habitat including species at risk and migratory birds; surface water, fish or fish habitat; or other sensitive sites.

- .1 No operator of a quarry is to establish or mine a quarry closer than 400 metres from a residence, unless the operator has established a vegetated berm or tree screen sufficient to shield the quarry from view from the residence.
- .2 With the exception of quarries that are contiguous with the road right-of-way, all quarry operations shall maintain a 100 metres buffer from the proposed road right-of-way. If no vegetated buffer or screen exists this distance shall be at least 150 metres.
- .3 Habitat occupied by endangered species shall be avoided (GR130.19.2).
- .4 Quarry site selection shall consider the proximity of sensitive sites including waterbodies, wildlife, heritage resources and culturally important sites. Setbacks will vary depending on circumstances however selected areas are to be a minimum of:
 1. 100 m from a water course or water body (GR130.15.1.2)
 2. 100 m buffer from any large stick nest, eagle nest, heron rookery, or any other sensitive wildlife area (GR130.19.9)
 3. 30 m from heritage resources or identified cultural sites
 4. 400 m from any residence
 5. 15 m from the property line
 6. Other setbacks as required
- .5 Prior to development quarry sites shall be assessed for the potential of acid rock generation with the intent of not developing such sites.

6.0 Quarry Development

.1 General

- .3 The Contractor is to comply with all legislation, licences, authorizations and permits respecting the Project.
- .4 All operations are subject to the appropriate Acts and Regulations,
- .5 The Contractor is not to commence any mobilization or drilling activities until a Quarry Lease and Work Permit have been issued by the Province of Manitoba.
- .6 The Contractor's Site Supervisor is to attend a pre-construction meeting with the Contract Administrator, at a mutually agreed upon date, to discuss the

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development of the quarry and establishment of the crushing operation. The meeting is to be initiated by the Contractor and be held in advance of commencing the field quarry establishment operations. Topics to be discussed will include the type and quantity of equipment to be used, sequence of work, traffic control, environmental requirements and other pertinent topics.

.2 Scope of Work

- .1 The development of the Quarry shall be in accordance with the site plan submitted to Manitoba Infrastructure - Remote Road Operations prior to the beginning of construction and the immediate quarry area plan provided to Manitoba Sustainable Development as part of the work permit application.
- .2 The major components of the Work are as follows:
 - a) Access Road Construction,
 - b) Clearing and Grubbing,
 - c) Blasting, and
 - d) Gravel Crushing and Stockpiling of Aggregate.
- .3 A buffer zone shall be maintained between the excavation area and the registered quarry site boundary.

.3 Fuel Handling and Spill Response

- .1 All dangerous goods must be handled in accordance with The Dangerous Goods Handling and Transportation Act.
- .2 The Contractor shall ensure that due care and caution is taken to prevent spills, at all times.
- .3 Tank vehicles used to deliver fuel to the work site and/or used to move fuel around the work site must meet the requirements for highway tanks for the shipment of dangerous goods by road set out in CSA Preliminary Standard B620-98, *Highway Tanks and Portable Tanks for the Transportation of Dangerous Goods*
- .4 An updated list of key contacts and telephone numbers for reporting spills, problems, etc., is to be kept on-site at all times.
- .5 A Workplace Hazardous Materials Information System (WHMIS) file is to be maintained on-site for all hazardous materials at the work area. Prior to commencement of the Work, Material Safety Data Sheets (MSDS) are to be submitted to the Contract Administrator for all hazardous materials to be used on-site. No material shall be brought to the site without prior submission of a MSDS.
- .6 All spills shall be reported to the Contract Administrator within 24 hours. The spill report shall include the following:
 - Personnel responding to the spill,
 - Material spilled,
 - Cause of spill,

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- Estimated amount of material spilled,
 - Estimated area and volume of soil affected by the spill,
 - Cleanup action undertaken, and
 - Means used to contain, transport and dispose of the materials involved.
- .7 The Contractor shall designate a qualified supervisor(s) as the on-site emergency response coordinator(s). The emergency response coordinator(s) shall have the authority to redirect manpower and equipment in order to respond in the event of a spill.
- .8 Appropriate materials for containment and cleanup of any spill of dangerous goods or hazardous wastes shall be available on-site when such materials are present in the work area. Also designated personnel and first responders shall be familiar with the storage location and proper application of such containment and cleanup materials.
- .9 All spills shall be contained and cleaned up immediately by on-site personnel in accordance with the on-site emergency response and containment plan.

.4 Quarry Site Development and Mobilization

.1 Description

- .1 Site development and mobilization covers the mobilization and demobilization of equipment, tools, materials, facilities and all things necessary for the Work including but not limited to site access, site work roads, site drainage, snow removal, clearing and grubbing, general site cleanup and restoration.

.2 Equipment/Materials

- .1 Equipment, implements, tools, materials, and facilities are to be of a size and type as required to complete the Work in the required time. The equipment to be used for the Work is to include, but may not be limited to, bulldozers, front-end loaders, rock trucks, graders and backhoes.
- .2 All equipment, implements, tools, plants, materials, and facilities are to be kept in good working order. The Contractor is required to have sufficient standby equipment available at all times, as required.

.3 Submittals

- The Contractor shall submit to Manitoba Infrastructure – Remote Road Operations a site plan showing the location of the proposed crushing operation.
- The Contractor is to provide Manitoba Infrastructure – Remote Road Operations at least eleven working days advance notice of the location of the crushing operation. The notice to Manitoba Infrastructure – Remote Road Operations is to include a drawing of the working area including the location of the initial extraction area, the progression of the extraction area and the location of sheds, offices, toilets and other temporary structures, drainage and stockpile areas. The suitability of the working area is to be subject to approval of Manitoba Infrastructure – Remote Road Operations.

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- The Contractor is to provide the Contract Administrator with at least six working days advance notice of the intention to commence production of aggregates. The notice shall include a preliminary schedule for the clearing, establishment of access, relocation of equipment, establishment of water and wastewater services, blasting and commencement of crushing operation.
- Prior to preparatory work for each blast the Contractor is required to submit a blast plan to the Contract Administrator including such information as:
 - The location, depth and area of each blast;
 - Diameter, depth, pattern and inclination of blast holes;
 - The type, strength, amount, column load and distribution of explosives to be used per hole, per delay and per blast; and
 - The sequence and pattern of delays and the description and purposes of any special methods to be adopted.

.4 Construction Methods

- .1 Site work roads are to be confined to the Quarry Lease with the exception of the quarry access road.
- .2 The Contractor is responsible for maintaining the site and promoting surface water runoff to minimize ponding after rainfall events. In the event that ponding does occur, it shall be discharged or removed through erosion and sediment control devices, as accepted by the Contract Administrator.

.5 Clearing and Grubbing

.1 Description

- .1 Clearing and grubbing consists of the removal and disposal of all tree stumps, roots, logs, shrubs, grass, weeds, fallen timber and other surface litter wherever they occur within the crushing operation and stockpile sites.
- .2 Burning of debris piles will be required when large accumulations of limbs and tops are not desired as fuelwood or for use as alternate forest products. Piles left for long periods of time will become a fire hazard.
- .3 All persons involved in clearing and grubbing activities shall follow safe work practices and procedures regarding chain saw operation, fueling, personal protective equipment, safety features, and transportation and storage.
- .4 All persons involved in tree felling shall possess a training certificate for chainsaw and tree felling operations.

.2 Construction Methods

- .1 Prior to the production of aggregates, the source of supply is to be cleared, grubbed and stripped of overburden to only the extent and manner necessary as approved by Manitoba Infrastructure – Remote Road Operations.
- .2 Brush disposal must be in accordance with the *Manitoba Conservation Brush Disposal Guidebook – March 2005*.

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- .3 Within the limits as directed and staked out by Manitoba Infrastructure – Remote Road Operations, all brush and trees, except those designated by Manitoba Infrastructure – Remote Road Operations to be saved, is to be cut level with the ground, and all surface debris, excluding merchantable timber but including fallen timber, slash limbs, brush, grass and weeds, is to be disposed as directed or permitted by Manitoba Infrastructure – Remote Road Operations.
- .4 Within areas where excavation will be made and where the embankment grade is less than one metre above the original ground level, all stumps and roots are to be grubbed out.
- .5 Trees are to be felled towards the centre of the area to be cleared. Any brush falling outside the area to be cleared is to be moved back to the work area and disposed as directed by Manitoba Infrastructure – Remote Road Operations. The Contractor is to take all precautions against the damage to other trees, traffic structures, pole lines or property in the felling of trees. The Contractor is liable for any damages occurring in the performance of this work.
- .6 Timber from which forest products can be manufactured is to be cleared of limbs and piled on the quarry site as directed or permitted by Manitoba Infrastructure – Remote Road Operations. Usable timber is to be the property of the Contractor and is to be removed from the work area.
- .7 A buffer zone is to be maintained between the excavation area and the registered quarry site boundary
- .8 No operator of a quarry is to establish or mine a quarry closer than 150 metres from a Provincial Trunk Highway, or Provincial Road, unless the operator has established a vegetated berm or tree screen sufficient to shield the quarry from view from the road or residence. A quarry is not to be established within 400 metres of a residence
- .9 The burning of debris piles is not permitted in the spring or early summer to avoid disturbing small wildlife species which may have young in the piles or may have prepared nesting sites. The best and preferred option for wildlife is burning in the late summer or fall.
- .10 No burning of debris piles shall occur on deep organic soils. Piles shall be a minimum of 15 metres away from standing timber and the high water mark of any waterbody.
- .11 Slash shall be piled in a manner that allows for clean, efficient burning of all material. Avoid mixing soil into the slash.
- .12 A burning permit is required, for open fires, between April 1 and November 15. Burning between November 16 and March 31 does not require a burning permit; however, the supervising officer must be advised prior to any burning. All fires must be completely extinguished by March 31.
- .13 Ensure safety precautions are taken to keep the fire under control. Burn piles must be monitored, to ensure that subsequent fire hazards are not present. Upon completion of the burn, burn piles must be completely extinguished.

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- .14 All occurrences of fire spreading beyond the debris piles must be reported to the District Supervisor.

7.0 Quarrying and Crushing Operations

.1 Description

- .1 Quarrying and Crushing Operations consist of those activities associated with the day to day operation of the quarry site, including but not limited to blasting, crushing and stockpiling of materials.

.2 Materials

- .1 The produced aggregate and supplementary granular material shall consist of sound durable particles of crushed rock, gravel, stone, sand and fines free from sod, roots and organic material.
- .2 The aggregate shall be well-graded and shall not vary from the maximum to minimum of the specification ranges for consecutive tests.
- .3 Traffic gravel shall be subject to testing at the time the material is being produced in accordance with Manitoba Infrastructure – Remote Road Operations instruction. The Contractor shall place the processed aggregate in a separate stockpile until satisfactory production tests have been completed. Rejected material shall be immediately moved either to the vicinity of the feed end of the crusher for reprocessing or to an area completely removed from any approved material.
- .4 The addition of supplementary granular material to a quarried material shall not be permitted.
- .5 Crushers shall, unless otherwise approved by Manitoba Infrastructure – Remote Road Operations, be equipped with an approved mechanical sampling device for obtaining samples off the main delivery belt.

.3 Submittals

- .1 In accordance with Section 25 of the Manitoba Provincial *Quarry Minerals Regulation – M162* the holder of a quarry shall provide the Mining Recorder with:
- An annual statement of the total quantity of quarry mineral produced from the quarry lease;
 - A royalty payment;
 - A rehabilitation levy payment; and
 - The annual rent, no later than the 30th day following the anniversary date of the lease.
- .2 Only quarry minerals that are **produced and removed** from the quarry shall be included within the annual statement.
- .3 Quarry mineral removed by a contractor for a public purpose is **exempt** from payment of royalties where the public agency certifies in an **exemption**

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certificate prepared on a form furnished by the recorder that the quarry mineral has been used for a public purpose.

- .4 Pursuant to subsection 6.3.1, a rehabilitation levy of **10¢ per tonne** is required for production of aggregate quarry mineral (** Every operator of an aggregate quarry shall remit to the recorder a rehabilitation levy equal to the product of the number of tonnes of aggregate quarry mineral produced multiplied by .10). This only applies to quarry minerals that are **produced and removed** from the quarry lease (the lease holder does not pay this fee as long as the quarry mineral remains stockpiled on the quarry lease).

.4 Construction Methods

- .1 Quarry operations shall not be permitted within 150 metres of a Provincial Trunk Highway or Provincial Road or within 400 m of a residence.
- .2 The Contractor is required to ensure all fuel storage and equipment servicing areas are located a minimum of 100 metres from any waterbody.
- .3 If authorized to work in or near a waterbody the Contractor is required to ensure that any work is done in accordance with the *Manitoba Stream Crossing Guidelines for the Protection of Fish and Fish Habitat, May 1996*.
- .4 The Contractor may be subject to operational restrictions if in close proximity to sensitive wildlife receptors such as caribou calving areas as required by Manitoba Infrastructure – Remote Road Operations and/or as provided by permit.
- .5 The Natural Resource Officer in Lake Winnipeg East, must be notified no less than one week prior to completion of operations to allow for final inspection of the operation.
- .6 All operations must be completed to the approval of the local Natural Resource Officer.
- .7 Immediately following blasting, and at any time during the quarry operation, all excavated faces which, in the opinion of the Contract Administrator and/or the Contractor, are unsafe or appear to endanger persons, work, or property, shall be scaled and the loose rock shall be removed from the excavation.
- .8 The active excavation face is to be maintained at stable slopes, to the satisfaction of the Contract Administrator.
- .9 The Contractor is required to adhere to the maximum peak particle velocity and minimum set back distances as recommended in the *Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters, 1998*.
- .10 The Contractor is required to minimize disturbance to vegetation and install erosion and sediment control measures to as directed by the Contract Administrator.
- .11 The Contractor is to maintain the quarry site in a tidy condition and free from the accumulation of debris.
- .12 The suitability and location of stockpile sites, as well as access to the sites, including sites at the crushing operation or elsewhere shall be subject to the approval of Manitoba Infrastructure – Remote Road Operations.

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- .13 The Contractor is required to provide stockpile sites, which are level, well-drained and have adequate bearing capacity to support the weight of the material which is to be placed thereon.
- .14 Stockpiles are to be constructed at locations and by methods that will neither interfere with nor damage utility lines or other utility infrastructure.
- .15 Access to stockpiles shall be readily available at all times
- .16 The Contractor is to clear the stockpile sites of all debris, vegetation, rocks, snow and other objectionable material prior to placing any aggregate on the stockpile sites.
- .17 The pile of material at the end of the discharge belt shall not be allowed to build up to a height greater than 3 metres.
- .18 Stockpiling is to be performed using loaders, trucks or stacking conveyors.
- .19 When trucks or loaders are used, loads shall be spot dumped uniformly over the entire stockpile area. The aggregate shall be placed in layers not exceeding 1.25 metres in depth. Each layer shall be completed and levelled prior to placing the succeeding layer.
- .20 If more than one material is to be stockpiled at the same site, each stockpile shall be separated by a sufficient distance to allow equipment access to all sides of the stockpile.
- .21 Aggregates which become mixed with others of different kind, class, source or gradation or which become contaminated by foreign material will be rejected and shall be promptly removed from the site of work.
- .22 The completed stockpiles shall be neat, regular in form and constructed to occupy the smallest feasible area.

8.0 Decommissioning Phase

- .1 A Decommissioning Plan is to be developed in consultation with Manitoba Infrastructure – Remote Road Operations and in accordance with all applicable Legislation and Regulations.

Prepared by: G.Chamberlain and A.Penner	Revision Number 20.3	Date Issued: May 2016
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Removed Table of Contents, corrected formatting		

Annex 4

**ENVIRONMENTAL
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TEMPORARY SITE DECOMMISSIONING

July 2016

1.0 Description

- .1 Upon the completion of work, all temporary sites shall be decommissioned. The decommissioning shall include the removal or disposal of all site debris, appropriate sloping and regrading of the area, removal of site access, and the promotion of natural re-establishment of vegetation.
- .3 The Contractor is responsible for ensuring compliance with all contract specifications, environmental legislation, permits and authorizations.

2.0 Purpose

- .1 The purpose of this procedure is to ensure that temporary site decommissioning operations are conducted in accordance with applicable environmental legislation, regulations, guidelines, permits and contracts.

3.0 Legislation and Supporting Documents

- ESRA Contracts and Associated Documents
- Applicable Manitoba Conservation Work Permits
- The Manitoba Stream Crossing Guidelines for the Protection of Fish Habitat – May 1996
- Fisheries Act (R.S., 1985, c. F-14)
- The Manitoba Conservation Forest Management Guidelines for Terrestrial Buffers – 2010-2015
- The Manitoba Conservation Brush Disposal Guidebook – March 2005
- Manitoba Infrastructure and Transportation Standard Construction Specifications for Grading – January 2008

4.0 Procedures

4.1 Site Decommissioning

- .1 All temporary structures and equipment must be removed from the temporary site.
- .2 All granular material shall be stripped and removed from the temporary site.
- .3 The area will be leveled to natural or pre-existing grade and slope prior to decommissioning the area. Stockpiled topsoil and other organic matter that had been removed from the site shall be spread to promote natural re-establishment of vegetation.

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4.2 Access Road Removal

- .1 Access roads and any equipment brought onto site shall be removed or blocked as soon as possible following completion of the work, or when no longer required.
- .2 Access roads will be obstructed and blocked using, rocks, gates, timbers or other barriers to impede access.

4.3 Re-Vegetation

- .1 Temporary site locations will be left in a manner which promotes natural re-vegetation of the site.
 - .1 In cases where seeding is required, and when conditions permit, it shall commence immediately upon completion of grading, capping and trimming operations. When conditions do not permit immediate seeding, ESRA will endeavor to ensure seeding is completed within the next growing season.
 - .2 Seeding operations shall not be carried out under adverse conditions of high winds, or ground covered with snow, ice, or standing water.

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Annex 5

Memorandum

To: Leanne Shewchuk
Manitoba East Side Road Authority

Date: July 13, 2016

From: Kevin Szwaluk
Szwaluk Environmental Consulting Ltd.

Re: Bloodvein Vegetation Recovery Assessment (P1-R6-WR)

Background

The following information provides an assessment of vegetation recovery along a portion of decommissioned winter road (approximately 1.5 km), located east of the community of Bloodvein. The winter road was blocked off in September 2011 from the recently developed P1 all season road and allowed to recover naturally without seeding.

Methods

The decommissioned winter road was surveyed June 25, 2016 to record information on vegetation species composition, structure and cover, based on levels identified from the Canadian Vegetation Classification System. Initially, a reconnaissance of the winter road was conducted by helicopter and photographs were captured of vegetation regeneration.

The full distance of the winter road was also walked by two ecologists (Kevin Szwaluk and Karin Newman) and an environmental officer from East Side Road Authority (Erica Werhun). Coordinates were recorded at two locations along the winter road, where descriptions of vegetation occurred (15U 661612E 5739305N, 661811E 5739967N). Photographs were also captured along the ground.

Vegetation Adjacent to the Winter Road

The surrounding vegetation adjacent to the winter road consists mainly of sparse (10-25%) to open (>25-60%) tree cover, on poorly drained soils. The vegetation dominantly is black spruce (*Picea mariana*) in the tree canopy with an understory of ericaceous shrubs (e.g., *Rhododendron groenlandicum*) and a ground layer of peat mosses (*Sphagnum* spp.) and feather mosses. Also present are areas of tamarack (*Larix laricina*) with speckled alder (*Alnus incana*) and willows (*Salix* spp.). Trembling aspen (*Populus tremuloides*) trees were also observed growing adjacent to the decommissioned winter road.

Vegetation Regeneration on the Winter Road

Vegetation cover on the decommissioned winter road consists dominantly of mixed herbaceous (i.e., forb and graminoid) closed cover (>60%) with a structure of very low (≤ 0.2 m) to low (>0.2-1m) plant height. The winter road is high in species number, with greater than 50 vascular species recorded. Table 1 includes species recorded on the decommissioned winter road. Common species included speckled alder (*Alnus incana*), wild red raspberry (*Rubus idaeus*), smooth wild strawberry (*Fragaria virginiana*), common horsetail (*Equisetum arvense*), reed grass (*Calamagrostis* spp.), common spike-rush (*Eleocharis palustris*), tufted bulrush (*Scirpus caespitosus*), closed-sheathed cotton-grass (*Eriophorum brachyantherum*) and Bebb's sedge (*Carex bebbi*). Ground cover consists of a variety of mosses, leaf litter, minor exposed soil, and occasional exposed rock.

Invasive and non-native species were mainly recorded along the southern portion of the winter road, and colonized the centreline trail on exposed soil from past vehicle travel. Exposed soil and rutting was generally minor along the winter road. Invasive species on the winter road included common dandelion (*Taraxacum officinale*), alsike clover (*Trifolium hybridum*), Canada thistle (*Cirsium arvense*), field sow-thistle (*Sonchus arvensis*), reed canarygrass (*Phalaris arundinacea*) and black medic (*Medicago lupulina*).

Regeneration of tree species is sparse (2-25%) along the winter road, and at the very low end of this range. Both coniferous (e.g., black spruce, jack pine, tamarack) and deciduous (e.g., trembling aspen, balsam poplar, white birch) species were observed. Heights of these species ranged from very low ($\leq 0.2\text{m}$) to intermediate ($>1\text{-}3\text{m}$). Specifically, heights were recorded for the following species, black spruce (0.1m - 1.5m), tamarack (1.2 – 1.5m), trembling aspen (0.5m – 2.5m), balsam poplar (0.2m), and paper birch (1.5m). Tree regeneration is more prominent near the mid-way of the winter road. Forest tent caterpillar presence was also observed on the winter road.

One species of conservation concern was observed in a wet depression. Northern arrowhead (*Sagittaria rigida*) is ranked rare (S2?) by the Manitoba Conservation Data Centre.

Conclusion

After five years (i.e., 2011 to 2016) of decommissioning the winter road, the natural herbaceous (i.e., forb and graminoid) vegetation consists of closed cover and the recovery rate is considered normal. This rate of recovery is related to ground disturbance, soil moisture and lack of a dominant tall shrub and tree stratum. The winter road was nearly uniform in amount of herbaceous cover however species recovery was variable as a result of soil drainage.

The cover of low shrub and tree regeneration on the winter road after five years of decommissioning is sparse, but the recovery rate is considered normal for the site. Some areas of the winter road were absent of low shrub and tree cover while tree regeneration was clearly evident at other locations. Based on the field assessment of the winter road, natural low shrub and tree regeneration is expected to continue to gradually increase annually, as a result of natural plant succession. Primary sources for tree regeneration will include those present on site, seeds dormant in the soil, and adjacent vegetation. Although black spruce will take decades to reach pre-disturbance conditions as a result of slow growth and the site, deciduous shrubs and trees like trembling aspen will continue to regenerate much quicker.

Minor areas of exposed soil were observed on the winter road and these areas were mainly related to rutting and possibly compaction from vehicle travel. Invasive and non-native species presence was evident in these areas along the southern portion of the winter road, and likely a result of recent construction activities (i.e., P1 all season road). The risk of invasive and non-native species introduction and spread is related to areas where these species have already established, such as existing roads and construction areas, and these plants are able to proliferate where opportunities exist.

The risk of soil erosion on the winter road after five years of decommissioning is low as a result of the flat or very gently sloping surface expression and closed vegetation cover.

The assessment of this winter road does not require any artificial seeding activity. The recovery of vegetation composition and abundance is typical, considering the site and soil drainage of the winter road. It is recommended that a follow-up assessment be conducted within two to three years to re-assess tree regeneration and monitor invasive and non-native species composition and abundance.



Photograph 1: Decommissioned winter road adjacent to the all season road.



Photograph 2: Herb cover on decommissioned winter road.



Photograph 3: Graminoid cover on decommissioned winter road.



Photograph 4: Invasive species on decommissioned winter road.



Photograph 5: Alder regeneration on decommissioned winter road.



Photograph 6: Black spruce regeneration on decommissioned winter road.



Photograph 7: Rutting on decommissioned winter road.



Photograph 8: Trembling aspen regeneration on decommissioned winter road.

Table 1. Flora of the Bloodvein Decommissioned Winter Road.

Scientific Name	Common Name	Family
<i>Achillea millefolium</i>	Common Yarrow	ASTERACEAE
<i>Alnus incana</i> ssp. <i>rugosa</i>	Speckled Alder	BETULACEAE
<i>Anemone canadensis</i>	Canada Anemone	RANUNCULACEAE
<i>Aralia hispida</i>	Bristly Sarsaparilla	ARALIACEAE
<i>Betula papyrifera</i>	Paper Birch	BETULACEAE
<i>Calamagrostis</i> sp.	Reed Grass	POACEAE
<i>Carex aquatilis</i>	Water Sedge	CYPERACEAE
<i>Carex bebbii</i>	Bebb's Sedge	CYPERACEAE
<i>Carex brunnescens</i>	Brownish Sedge	CYPERACEAE
<i>Carex magellanica</i>	Bog Sedge	CYPERACEAE
<i>Carex rostrata</i>	Beaked Sedge	CYPERACEAE
<i>Chamaedaphne calyculata</i>	Leatherleaf	ERICACEAE
<i>Cirsium arvense</i>	Canada Thistle	ASTERACEAE
<i>Cornus canadensis</i>	Bunchberry	CORNACEAE
<i>Drosera rotundifolia</i>	Round-leaved Sundew	DROSERACEAE
<i>Eleocharis palustris</i>	Common Spike-rush	CYPERACEAE
<i>Equisetum arvense</i>	Common Horsetail	EQUISETACEAE
<i>Equisetum fluviatile</i>	Swamp Horsetail	EQUISETACEAE
<i>Equisetum pratense</i>	Meadow Horsetail	EQUISETACEAE
<i>Equisetum sylvaticum</i>	Wood Horsetail	EQUISETACEAE
<i>Eriophorum brachyantherum</i>	Closed-sheathed Cotton-grass	CYPERACEAE
<i>Fragaria virginiana</i>	Smooth Wild Strawberry	ROSACEAE
<i>Galium boreale</i>	Northern Bedstraw	RUBIACEAE
<i>Geum aleppicum</i>	Yellow Avens	ROSACEAE
<i>Glyceria grandis</i>	Tall Manna Grass	POACEAE
<i>Kalmia polifolia</i>	Pale Laurel	ERICACEAE
<i>Larix laricina</i>	Tamarack	PINACEAE
<i>Lotus corniculatus</i>	Bird's-foot Trefoil	FABACEAE
<i>Medicago lupulina</i>	Black Medic	FABACEAE
<i>Phalaris arundinacea</i>	Reed Canarygrass	POACEAE
<i>Phleum pratense</i>	Timothy	POACEAE
<i>Picea mariana</i>	Black Spruce	PINACEAE
<i>Pinus banksiana</i>	Jack Pine	PINACEAE
<i>Populus tremuloides</i>	Trembling Aspen	SALICACEAE
<i>Rhododendron groenlandicum</i>	Labrador Tea	ERICACEAE
<i>Rubus idaeus</i>	Wild Red Raspberry	ROSACEAE
<i>Sagittaria rigida</i>	Northern Arrowhead	ALISMATACEAE
<i>Salix bebbiana</i>	Bebb's Willow	SALICACEAE
<i>Salix pedicellaris</i>	Bog Willow	SALICACEAE
<i>Salix pyrifolia</i>	Balsam Willow	SALICACEAE
<i>Schoenoplectus tabernaemontani</i>	Soft-stem Bulrush	CYPERACEAE
<i>Scirpus cyperinus</i>	Wool-grass	CYPERACEAE
<i>Scirpus microcarpus</i>	Small Fruited-bulrush	CYPERACEAE
<i>Scutellaria galericulata</i>	Marsh Skullcap	LAMIACEAE

<i>Sium suave</i>	Water Parsnip	APIACEAE
<i>Sonchus arvensis</i>	Field Sow-thistle	ASTERACEAE
<i>Symphotrichum ciliolatum</i>	Lindley's Aster	ASTERACEAE
<i>Taraxacum officinale</i>	Common Dandelion	ASTERACEAE
<i>Trifolium hybridum</i>	Alsike Clover	FABACEAE
<i>Typha</i> sp.	Unknown Cat-tail	TYPHACEAE
<i>Vaccinium oxycoccus</i>	Small Cranberry	ERICACEAE
<i>Vicia americana</i>	American Vetch	FABACEAE
<i>Viola</i> sp.	Violet	VIOLACEAE

Annex 6

**ENVIRONMENTAL
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**WINTER ROAD CLOSURE AND
RECLAMATION PLAN**

August 2016

1.0 Description

- .1 With construction of all-season roads, existing winter roads will be closed, in segments or in whole, and left to regenerate naturally.
- .2 Decommissioning of the winter road shall include the removal of site access, removal of culverts, installation of erosion and sediment control (if required) and the promotion of natural re-establishment of vegetation. The Contractor is responsible for ensuring compliance with all contract specifications, environmental legislation, permits and authorizations.

2.0 Purpose

- .1 The purpose of this procedure is to ensure that the decommissioning and reclamation of the winter road is conducted in accordance with applicable environmental legislation, regulations, guidelines, permits and contracts.

3.0 Legislation and Supporting Documents

- ESRA Contracts and Associated Documents, specifically GR130.15 EP6 – Working In or Within Water, and EP11 – Culvert Maintenance and Replacement
- Applicable Manitoba Conservation Work Permits
- The Manitoba Stream Crossing Guidelines for the Protection of Fish Habitat – May 1996
- Fisheries Act (R.S., 1985, c. F-14)
- The Manitoba Conservation Forest Management Guidelines for Terrestrial Buffers – 2010-2015
- The Manitoba Conservation Brush Disposal Guidebook – March 2005
- Joro Consultants. (2015). Various Wildlife Photographs Provided by Joro Consultants from Research and Field Studies. Prepared for Manitoba Floodway and East Side Road Authority.

4.0 Procedures

4.1 Access Removal

- .1 As winter roads are decommissioned, access will be obstructed and blocked using, rocks, gates, timbers or other barriers to impede access.
- .2 Temporary access roads intersecting winter roads shall be decommissioned or blocked as soon as possible following completion of the work or when no longer required.

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- .3 Effective erosion and sediment control measures shall be installed where required.

4.2 Culvert Removal

- .1 Material and debris removal shall be timed to prevent disruption to sensitive fish life stages by adhering to DFO’s Regional Timing Windows to prevent disruption of fish and wildlife habitat. The contractor shall not undertake construction activities in fish bearing waters or potentially fish bearing waters between April 1 and June 30 of any year, or during periods of high stream flow.
- .2 Machinery shall arrive at site in a clean condition and shall be operated on land (from outside of the water) and in a manner that minimizes disturbance to the bed and banks of the watercourse.
- .3 Operate machinery, if required, from the top of bank.
- .4 Isolate your work area, if required, from all flowing water in a manner that does not cut off flow to downstream portions of the stream at the time during removal.
- .5 If dewatering of the site is required, a Fisheries Biologist holding all necessary permits required by fisheries agencies to collect and transport fish, should be on hand to make the final decision regarding the need for a water quality monitoring and fish salvage program. If fish salvage is necessary, recovered fish must be relocated to a safe area outside of the influence of the worksite and transport containers must not be overloaded with fish.
- .6 Remove any old structures to a suitable upland disposal site, away from the riparian area and floodplain to avoid waste material from re-entering the watercourse.
- .7 The bed and banks of the watercourse shall be restored to preexisting conditions following a disturbance.
- .8 A site visit shall be conducted prior to the commencement of in-water construction activities to determine the site-specific environmental protection measures that may be required (i.e., worksite isolation methods, site restoration considerations, erosion and sediment control materials required, etc.).
- .9 Cofferdams and other structures (diversions) shall be installed to separate the dewatered worksite from flowing water. Materials that are used to build these dams shall not be taken from below the high water mark (1 in 2 year high water level). Cofferdams shall be designed to accommodate any expected high flows during the construction period.
- .10 Downstream flows shall be maintained at all times. If isolated sites are required, flows shall be detoured around the sites, and original

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flows through the site shall be restored as soon as work is completed.

- .11 A fish salvage operation shall be conducted prior to dewatering of isolated sites.
- .12 Utilize culvert removal techniques that result in the least amount of impacts to the watercourse and riparian area.
- .13 The contractor shall avoid using frozen backfill.
- .14 Avoid culvert removal during wet and rainy periods
- .15 Slopes shall be contoured to an appropriate steepness to minimize erosion; erosion controls shall be installed as soon as possible, and maintained until complete re-vegetation of the disturbed area(s) is achieved.
- .16 Soils shall be graded in the direction away from the watercourse and never into the stream itself.
- .17 All brush disposal operations shall occur in accordance with the Clearing and Grubbing Environmental Protection Procedure (EP1).

4.3 Re-Vegetation

- .1 Winter roads will be left in a manner which promotes natural re-vegetation of the site.
- .2 Vegetation recovery for vascular plants is expected within 5 years, followed by longer periods of success for tree species.

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