



Star-Orion South Diamond Project ENVIRONMENTAL IMPACT STATEMENT SUMMARY

Summary of the Environmental Impact Statement of the
Star-Orion South Diamond Project proposed by Shore Gold Inc.

August 2013

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DISCLAIMER

This document was prepared by the Canadian Environmental Assessment Agency (the Agency) and based on the Environmental Impact Statement submitted by Shore Gold Inc. and the Fort à la Corne Joint Venture (the proponent) for the Star-Orion South Diamond Project (the Project). The environmental effects analysis and conclusions in this document are those of the proponent. The Agency's conclusions on the environmental effects of the Project will be presented in the Comprehensive Study Report which will be subject to a public comment period at a later date.

1 Purpose of the Document

The purpose of the Environmental Impact Statement (EIS) Summary is to enable public and Aboriginal participation during the conduct of the federal environmental assessment of the proposed Star-Orion South Diamond Project (the Project).

This document provides a summary of the Project, the environmental effects analysis as characterised by Shore Gold Inc. and the Fort à la Corne Joint Venture (the proponent), and public and Aboriginal participation in the environmental assessment to date. This Summary is based on the revised Environmental Impact Statement for the Star-Orion South Diamond Project (EIS) submitted by the proponent in August 2012 and supplemental information provided in April and July 2013 in response to federal information requests¹.

Specifically, this document describes the following:

- Scope of the Project for the purpose of the comprehensive study being conducted by the Agency;
- Components of the environment that may be affected by the Project²;
- Nature of the interaction between the Project and the identified environmental components (i.e. environmental effects) as described by the proponent;
- Mitigation measures proposed by the proponent that avoids or reduces the adverse environmental effects of the Project;
- Residual environmental effects and their significance as determined by the proponent after taking into consideration the proposed mitigation; and
- Results of public and Aboriginal consultation undertaken to date by the proponent and Agency.

The public and Aboriginal peoples are invited to review and provide comments on any aspect of this document. However the Canadian Environmental Assessment Agency (the Agency)'s primary interest in requesting comments is to solicit input on whether the environmental effects of the Project and appropriate measures to mitigate the environmental effects are adequately and accurately characterised by the proponent.

Comments received on this document will be considered by the Agency when preparing the federal comprehensive study report (CSR). The CSR will describe the Project, its potential adverse environmental effects, measures proposed to mitigate those identified adverse environmental effects, the significance of any residual adverse environmental effects after taking into account implementation of proposed mitigation, and the need for

¹ The August 2012 EIS, supplemental information and federal information requests can be accessed on the Canadian Environmental Assessment Registry Internet Site (CEARIS) at <http://www.ceaa-acee.gc.ca/050/documents-eng.cfm?evaluation=46277&type=1>.

² This document only summarises environmental effects of the Project on a select number of environmental factors. For more details, refer to section 6.2 of this document.

and requirements of a follow-up program. The significance of the residual environmental effects takes into account the proponent's EIS, comments received from the public, Aboriginal peoples, and expert federal reviewers during the conduct of the environmental assessment.

The CSR will be made available for public and Aboriginal review and comment once it is completed. The CSR, along with any comments received from the public and Aboriginal peoples, will be considered by the Minister of the Environment in reaching an environmental assessment decision.

2 Project Overview

The proponent proposes to construct, operate and eventually decommission the Star-Orion South Diamond Project, a diamond mining and processing facility to be developed within the Fort à la Corne (FaIC) Provincial Forest. The Project is located approximately 60 kilometres east of Prince Albert, Saskatchewan (Figure 1).

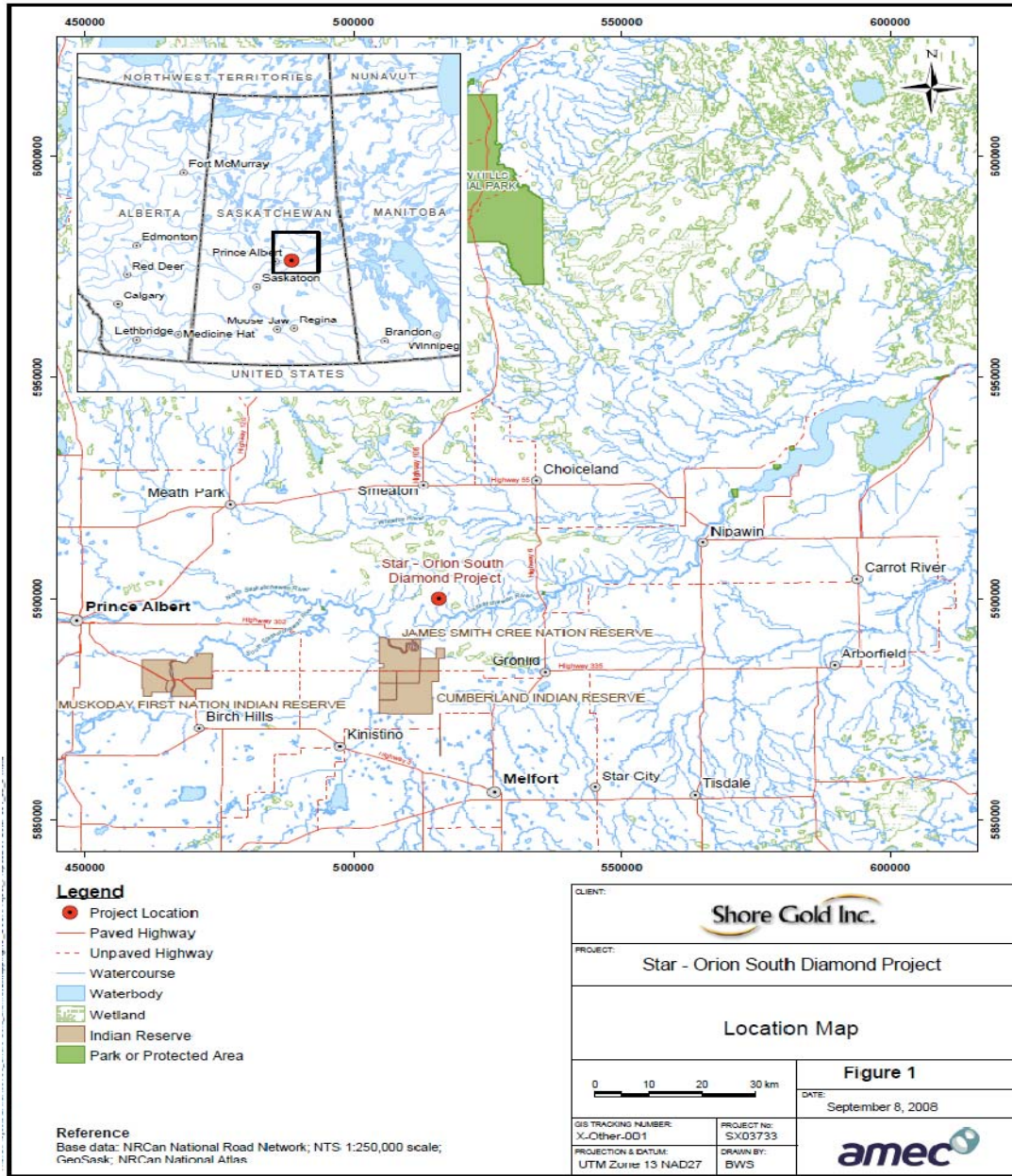


Figure 1: Project Site Location, Fort à la Corne (FALC) Provincial Forest, SK (source: Shore Gold Project Proposal – 2008).

The Project includes a four-year construction period followed by the excavation of two open-pit mines and processing of approximately 45,000 tonnes of kimberlite rock per day over a projected 20-year period. The proponent's plans for decommissioning include progressive reclamation activities beginning within five years from the start of construction and will continue beyond the operations phase of the Project.

2.1 Project Components

The Project includes the following components³:

- Two open-pit mines and supporting infrastructure;
- Overburden and waste rock management;
- Kimberlite mining and stockpiling;
- Kimberlite processing facilities;
- Effluent and processed kimberlite management;
- Mine-site infrastructure (e.g. conveyor system);
- Temporary construction camp;
- Water management infrastructure (e.g. pit-dewatering system, drainage impoundment, intake and outfall structures);
- Explosives manufacturing, handling, storage and use;
- Fuel and lubricant storage tanks and fueling stations;
- Domestic sewage treatment and disposal;
- Solid and industrial waste handling and treatment including management of hazardous materials;
- Access corridor (i.e. access road, widening of the White Fox Bridge, natural gas pipeline);
- Works to offset the loss of fish habitat caused by the Project; and
- Ancillary infrastructure (e.g. maintenance buildings).

The general layout of the project site is presented on Figure 2.

³ The power line and electrical supply system is not within the scope of the Project and subject to a provincial environmental assessment.

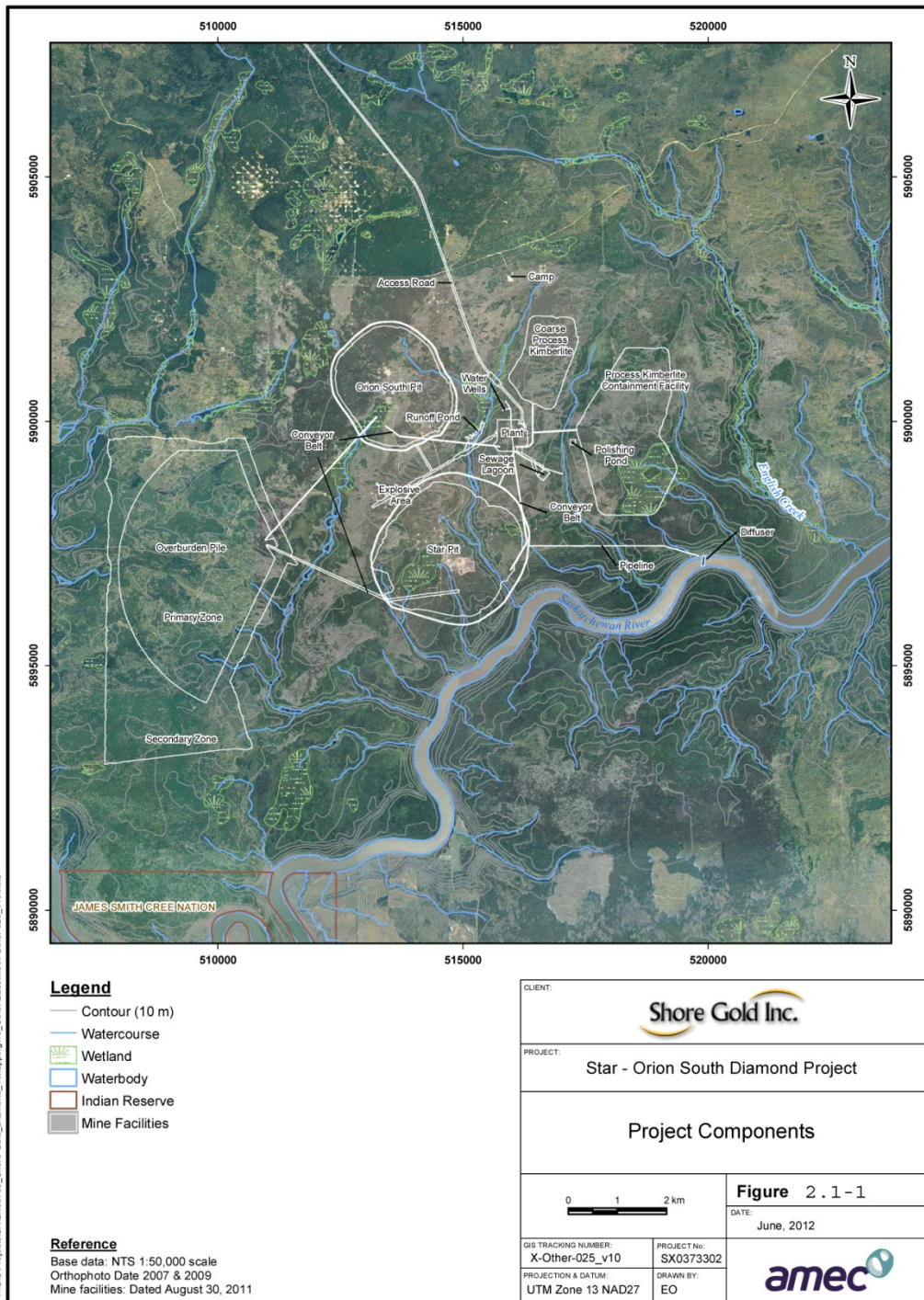


Figure 2: Project Site Layout, Fort à la Corne (FaLC) Provincial Forest, SK (source: Shore Gold Revised EIS - 2012).

2.2 Project Activities

Activities associated with construction, operation, and decommissioning of the Project are outlined in Table 1 below.

Table 1: Project Activities of the Star-Orion South Diamond Mine

Construction	Operation	Decommissioning
- decommissioning and removal of existing facilities	- kimberlite excavation, storage and processing	- site reclamation
- site clearing and preparation, including removal of portions of existing roads	- mining effluent and processed kimberlite management	- natural flooding of open pits
- surface and ground water management	- surface and ground water management	- stabilization / re-vegetation of pit slopes
- pit dewatering	- overburden and waste rock management	- disposal of non-hazardous demolition wastes
- overburden management	- fuel and materials management	- dismantling, cleaning, and disposal of buildings, machinery, equipment, and surface pipelines
- fish habitat restoration works	- explosives manufacturing, handling, storage and use	- capping processed kimberlite piles with overburden
- mining effluent infrastructure and construction of processed kimberlite management facilities	- domestic sewage treatment and disposal	- re-vegetation
- waste management and disposal	- solid waste management	- establish runoff management
- construction of ancillary facilities including: access corridor, processing plant, accommodations, administration complex, bulk-sample plant, maintenance buildings, warehouse and cold-storage buildings, fuel and lubricant storage, interpretive center	- progressive reclamation and direct placement of reclamation materials	- ongoing monitoring and site management
	- ongoing monitoring and site management	

3 Environmental Assessment Requirements

3.1 Federal Environmental Assessment Requirements

An environmental assessment is required under the *Canadian Environmental Assessment Act*, 1992 (the Act)⁴ before federal authorities can make certain decisions that would enable a project to proceed in whole or in part. A federal environmental assessment is required for the Project because Fisheries and Oceans Canada (DFO), Transport Canada (TC) and Natural Resources Canada (NRCan) may have regulatory decisions to take in relation to the Project.

The Project requires a comprehensive study type environmental assessment as it meets the requirements of the *Comprehensive Study List Regulations* related to the construction, decommissioning, or abandonment of a facility for the extraction of 200,000 cubic meters per year or more of groundwater.

Federal Environmental Assessment Responsibilities

The Minister of the Environment is required to issue an environmental assessment Decision Statement which considers the CSR, and public and Aboriginal comments received.

The environmental assessment Decision Statement includes:

- The Minister's opinion as to whether, after taking into account the implementation of any mitigation measures the Minister considers appropriate, the Project is, or is not, likely to cause significant adverse environmental effects; and
- Any mitigation measures or follow-up program that the Minister considers appropriate.

Pursuant to the Act, the Agency is responsible for conducting the comprehensive study for the Project and submitting the CSR to the Minister of the Environment.

In addition to providing input relevant to their respective regulatory approvals, DFO, TC and NRCan are providing expert advice to the Agency during the comprehensive study. Environment Canada, Health Canada, and Aboriginal Affairs and Northern Development Canada (AANDC) are also providing expert advice to the Agency.

3.2 Provincial Environmental Assessment Requirements

The Project is subject to ministerial approval under the *Environmental Assessment Act* for the Province of Saskatchewan (Saskatchewan) as well as several provincial

⁴ On 6 July 2012, the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) came into force, replacing the former Act. Comprehensive studies begun under the former Act continue to be conducted under the comprehensive study process outlined in the former Act, in accordance with specified timelines.

regulatory requirements. Consistent with the provisions of the *Canada-Saskatchewan Agreement on Environmental Assessment Cooperation (2007)*, the comprehensive study will consider the information generated through the cooperative environmental assessment process.

3.3 Scope of Project

On 16 November 2010, the Agency issued a comprehensive study scoping document that described the proposed scope of Project, environmental assessment and consultation requirements to be considered for the purpose of the comprehensive study. The document can be accessed on the Canadian Environmental Assessment Registry Internet Site (CEARIS) at:

<http://www.ceaa-acee.gc.ca/050/document-eng.cfm?document=46680>.

The scope of Project for the comprehensive study includes all physical works and activities associated with construction, operation, modification, decommissioning, site reclamation, and abandonment associated with the Star-Orion South Diamond Project as outlined in section 2.1 and 2.2 of this document.

4 Stakeholder Engagement

The proponent has engaged the public and Aboriginal groups in discussions about its mining interests in the region⁵. Engagement has been primarily achieved through its public and stakeholder representative group, the Diamond Development Advisory Committee (DDAC). The proponent has also undertaken numerous consultation activities to inform the public, stakeholders, Aboriginal groups, and government regulatory agencies about the Project, and to seek input during project planning. Activities have included open houses, newsletters, media press releases, site tours, an environmental interest workshop, public speaking engagements and in-person meetings.

The proponent reported that participants in its engagement activities have been generally positive toward the Project. While some attendees have shown some caution in regards to environmental protection measures, others have expressed a general trust that government authorities would ensure appropriate controls through their regulation of the Project.

Some of the areas of interest identified by stakeholders during the proponent's engagement activities include:

- Project description and alternatives;
- Decommissioning and closure plans;
- Environmental assessment, including environmental monitoring/management;

⁵ Refer to section 4.0 of the August 2012 EIS. A list of issues and interests resulting from all the proponent's engagement activities are provided in Appendix 4-F of the August 2012 EIS.

- Air quality;
- Vegetation;
- Water resources;
- Wildlife;
- Soils;
- Fisheries and aquatic resources;
- Historical resources;
- Public and Aboriginal engagement;
- Traditional and non-traditional land uses;
- Roads, traffic and access;
- Occupational health and safety;
- Economic development and tourism;
- Employment, training, contracting and procurement; and
- Housing and temporary accommodation.

5 Aboriginal Consultation⁶

5.1 Aboriginal Consultation Conducted by the Proponent

The proponent has undertaken a number of consultation activities to inform First Nations and Métis groups about the Project and seek input during project planning. The proponent has reported maintaining regular contact with the following Aboriginal groups:

- The three bands of the James Smith Cree Nation⁷;
- Muskoday First Nation;
- Métis Nation – Saskatchewan, Eastern Region II;
- Métis Nation – Saskatchewan, Western Region II;
- Sturgeon Lake First Nation;
- Red Earth Cree Nation; and
- Wahpeton Dakota Nation.

Potential environmental impacts and benefits of the Project were evaluated by the proponent through Aboriginal community meetings and workshops, and the conduct of traditional knowledge (TK), traditional land use (TLU) and archaeological studies. Several formal information-gathering agreements were reached between the proponent and Aboriginal groups in order to facilitate Aboriginal TLU and TK studies. TLU baseline studies and effects assessments for the Métis regional organizations, Sturgeon Lake First Nation, Red Earth Cree Nation, the three bands of James Smith Cree Nation,

⁶ Refer to section 4.0 of the August 2012 EIS. A list of issues and interests resulting from all the proponent's engagement activities are provided in Appendix 4-F of the August 2012 EIS.

⁷ James Smith Cree Nation operates as 3 entities that compose the First Nation, including the Chakastaypasin Cree Nation, Peter Chapman First Nation, and the original James Smith Cree Nation.

Muskoday First Nation and Wahpeton Dakota Nation have been completed and are summarized in section 5.4 and 6.4 of the EIS Report.

On 29 August 2008, an Aboriginal employment/development workplace partnership agreement was signed in Melfort by Saskatchewan's Ministry of First Nations and Métis Relations, industry representatives (including the proponent), several First Nations, Métis organizations and Saskatchewan training institutions. The Saskatchewan Government has since withdrawn its participation in all its Aboriginal employment partnerships throughout the province but the proponent and other signatories still their relationship outlined in the agreement. The proponent will continue its engagement with Aboriginal groups throughout the environmental assessment process and has expressed its commitment to engagement during the construction, operations and closure activities.

In addition to the information-gathering agreements, the proponent has signed other agreements with Aboriginal groups including:

- Memorandum of Understanding – Métis Nation – Saskatchewan Western Region II – June 17, 2010;
- Memorandum of Understanding – Métis Nation – Saskatchewan Eastern Region II – June 16, 2010;
- Memorandum of Understanding – Sturgeon Lake First Nation – May 14, 2010;
- Memorandum of Understanding – Wahpeton Dakota Nation – January 19, 2011; and
- Mutual Cooperation Agreement – Wahpeton Dakota Nation – June 9, 2011.

5.2 Aboriginal Consultation Conducted by the Agency

In May 2010, the Agency consulted with the public and Aboriginal peoples about the requirements for the comprehensive study of the Project. A scoping document for the comprehensive study was provided as a basis for the consultation. As well, public and Aboriginal consultation on draft Project-Specific Guidelines for the Preparation of an Environmental Impact Statement (EIS Guidelines) was jointly conducted with Saskatchewan during July and August of 2009.

In December 2010, the proponent submitted its draft EIS report to Saskatchewan and the Agency. It was distributed to the federal and provincial technical reviewers and interested Aboriginal groups participating in the environmental assessment.

The Agency provided funding to the following Aboriginal groups to participate in consultation meetings with the federal government and provide comments on the EIS guidelines, EIS and CSR: Muskoday First Nation, James Smith Cree Nation, Archerwill Métis Local #58 Inc. (on behalf of the Métis Nation – Saskatchewan Eastern Region II and Métis Nation – Saskatchewan Western Region II), Cumberland House Cree Nation and Red Earth Cree Nation.

Additional consultation with Aboriginal groups will be coordinated by the Agency during the completion of the comprehensive study and upon the release of the CSR.

5.3 Summary of Aboriginal Concerns

The following list summarizes the main concerns raised by Aboriginal groups during their review of the scoping document, EIS Guidelines and EIS:

- Adverse effects on hunting, fishing, trapping, logging and harvesting of traditional plants;
- Adverse effects from brackish water discharge into the Saskatchewan River that could adversely affect fish such as lake sturgeon;
- Restricted access to traditional lands, including important hunting and berry gathering areas and cultural sites located in the Project area;
- Noise and vibration from the project site that might be felt on reserve lands in the area, and affect people and animals;
- Increased traffic and changes to existing roads/current access routes to traditional lands;
- New or increased access to their traditional lands by non-Aboriginal hunters and fishermen;
- Impacts to air quality including increased fugitive dust;
- Impacts to soils including potential contamination from metal leaching that could adversely affect traditional lands;
- Adverse effects on rare plants;
- Potential contamination of country foods;
- Adverse effects on well-water quality and quantity;
- Physical impacts on sacred and cultural sites;
- Concern that site reclamation would not be adequate or appropriate mitigation; and
- Adverse effects on Aboriginal and treaty rights.

6 Potential Environmental Effects

6.1 Valued Components Considered by the Proponent

All project-environment interactions were considered by the proponent before focusing the environmental assessment on valued components (VCs). VCs were selected by the proponent for inclusion in its effects analysis on the basis of issues and interests identified by key stakeholder groups, professional judgement, its value or sensitivity to the environment.

The following VCs were selected by the proponent:

- Traditional knowledge and traditional land use including hunting, gathering, fishing, cultural sites and conditions of use VCs;

- Terrain, soils and geology;
- Climate and air quality, including noise;
- Water resources, including groundwater and surface water quality and quantity;
- Vegetation and plant communities, including rare plants;
- Wildlife and habitat;
- Fisheries and aquatic resources;
- Biodiversity;
- Archaeological and heritage resources;
- Family and community well-being, including human health;
- Family and community services, including housing, infrastructure and transportation;
- Economics including regional employment, provincial economic activity and government revenues;
- Visual aesthetics; and
- Navigable waters.

The environmental effects analysis conducted by the proponent was based on standard environmental assessment methodology, professional judgment, literature searches, scientific data, traditional knowledge field studies conducted between 1996 and 2010, computer modeling and consideration of comments received during public and Aboriginal consultations. Environmental effects were characterised based on direction, magnitude, geographic extent, duration, and frequency. Additional information on the proponent’s environmental assessment methods, including the determination of significance, is found in section 6.1 of the EIS.

The proponent also considered the potential effects of accidents and malfunctions, and effects of the environment that may occur during construction or operation of the Project.

6.2 Environmental Effects on Select Valued Components

Due to the sheer volume of information provided in the EIS, a sub-set of Valued Components are highlighted in this document:

Biophysical Environment

- Water quality and quantity, including surface water and groundwater
- Species at risk
- Fish and fish habitat
- Terrestrial habitat
- Wildlife, including migratory birds, and wildlife habitat

Socio-Economic and Cultural Environment

- Traditional use
- Navigable waters

The following sections provide a summary of the proponent's description of the potential environmental effects of the Valued Components listed above and their associated mitigation measures. A summary table of the potential environmental effects and proposed mitigation measures can be found in Appendix A.

6.2.1 Environmental Effects on Water Quality and Quantity⁸

The EIS includes an assessment of the aquatic environment including: portions of nine streams that drain into the Saskatchewan River; a reach of the Saskatchewan River located between the outlets of Caution Creek and English Creek; and a portion of the White Fox River adjacent to an existing bridge, where the access corridor for communication lines and a natural-gas pipeline is proposed.

Surface Water Quality

Sediment Transport - During construction and operations, water quality in tributaries, and subsequently the Saskatchewan River, would be affected by sediment transported by runoff. To minimize the transport of sediment into surface water bodies, erosion of the overburden and rock storage pile will be minimised by progressive reclamation of lower side slopes; as well, runoff would be diverted around the pits to retention and drainage structures and managed in the Processed Kimberlite Containment Facility (PKCF) or directed to sedimentation ponds prior to release in the tributaries. The proponent will employ erosion and sediment control measures and best management practices such as silt fences, retention and drainage structures, and temporary sedimentation ponds. As changes in sediment quality from changes in water quality are complex and not easily predicted, the proponent will monitor sediment quality in the receiving environment during construction and operations.

Water Quality Discharge into the Saskatchewan River - During construction and operations, water quality of the Saskatchewan River would be affected by receiving discharge from the tributaries and outfall/diffuser. Tributary runoff includes water from the sewage lagoon, site runoff and diverted runoff around the site. Management of runoff off into the tributaries are similar to the mitigation measures for sediment transport described above. Effluent from the sewage lagoon will meet regulatory guidelines prior to being released into the Duke Ravine.

The discharge from the outfall/diffuser into the Saskatchewan River would consist of water from the PKCF (contact water, atmospheric precipitation and process water from the processing and bulk sample plants) and groundwater from pit dewatering.

⁸ Refer to 6.2.7 Surface Water Quality of the August 2012 EIS, and supplemental information on the proponent's updated water management strategy: http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Updated_Water_Management_Strategy-march_27.pdf and water balance and water chemistry results: http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Water_Balance_and_Water_Chemistry_Results.pdf.

The PKCF would manage contact water, process water from the plants, and seepage from the site facilities. Contact water would be captured by drainage ditches or interception wells and discharged to adjacent wetlands or sedimentation ponds for treatment before returning to the creeks, or pumped back into the PKCF depending on water quality. Water from the PKCF would be recycled to the processing plant as required. The majority of water for plant processing will be drawn from the Saskatchewan River.

Final effluent discharge into the Saskatchewan River via an outfall/diffuser would consist of a blend of PKCF decant water and groundwater from pit dewatering. Water quality of the discharge is expected to meet both provincial and federal discharge requirements. The proponent will monitor discharge in the vicinity of the diffuser to ensure concentrations are not exceeded.

For water used to supplement tributaries during low flow periods (refer to section Surface Water Quantity below), water quality will be monitored to ensure the water meets the relevant regulatory requirements.

At closure, the Star and Orion South pits will naturally fill with mostly groundwater to create lakes. The Saskatchewan River would receive overflow from the Star Pit via the East Ravine 320 years after the end of mining. The reclaimed PKCF will drain to the Duke Ravine and become part of the watershed. The water quality of Star pit overflow at post-closure and discharge from the PKCF are predicted to meet regulatory requirements and thus have low potential to affect water quality.

After taking into account the implementation of the proposed mitigation measures, the proponent concludes that the overall Project effect on water quality of the tributaries and Saskatchewan River falls within the natural range of variability and therefore would not be significant. Water quality parameters that naturally exceed provincial and federal guidelines in the baseline conditions (e.g. iron, aluminium and several dissolved metals) remain above applicable guidelines.

Surface Water Quantity⁹

Tributary Flows - Particular tributary streams of the Saskatchewan River would experience substantial changes to historical flow patterns due to physical changes to the drainage basins and the effects of pit dewatering. Namely, the East Ravine and approximately half of the West Ravine drainage areas would be lost as a result of development of the Star and Orion South pits. The PKCF would capture and store runoff

⁹ Refer to the supplemental information on the updated Hydrology Assessment http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Hydrology_assessment_revised.pdf and the Project's updated water management strategy http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Updated_Water_Management_Strategy-march_27.pdf.

from portions of some tributaries, resulting in a reduction in flows. Other tributaries would experience an increased discharge as a result of increased runoff and reduced evapotranspiration following the development of the Overburden and Rock Storage pile and site water management.

In addition, flow reductions in local streams are predicted to occur as a result of reduced contribution from groundwater sources. Flows would change considerably in proximity to the mine pit excavations due to mining and pit-dewatering operations (effects of pit dewatering are described in the Groundwater section below). For streams that have little or no physical disturbance occurring in their watersheds, Project effects would be greatest 45 to 60 years after the start of Project construction due to lowering of groundwater levels. The groundwater discharge would start to increase towards pre-development levels after this point in time.

The proponent will supplement low flows in 101 Ravine, Duke Ravine and English Creek if needed from water diverted from the East Ravine runoff pond. Flows to undisturbed sections of the East Ravine would be re-established following project closure.

Saskatchewan River Flows – The majority of water for the processing plant would be sourced from the Saskatchewan River and piped directly from the River using an intake structure. The volume of water withdrawn from the River ranges from 23 to 24 Mm³ per year; the water however will be discharged back into the River (with the addition of water from the PKCF and site operations) through the outfall/diffuser.

The maximum reduction of groundwater discharge to the Saskatchewan River would be 0.006% of the baseline annual mean discharge. The proponent concludes the Project would have a negligible effect on the Saskatchewan River groundwater discharge.

Overall, the proponent concludes that the environmental effect on the river's net flows would be minimal (i.e., maximum increase of 0.5% of the mean annual flow) and therefore not significant.

Groundwater¹⁰

Groundwater Flows - Excavation of the Star and Orion South open pits would require dewatering of the shallow and deep groundwater in order to keep the excavations dry. Dewatering activities would cause drawdown of surface aquifers in the immediate Project area as well as in the deep aquifer that extends beyond the FaIC Provincial Forest. The surficial aquifer provides baseflow to local creeks and the Saskatchewan River, and is a source for private water wells. Mitigation strategies on supplementing flow to some tributaries affected by drawdown are discussed in the Surface Water

¹⁰ Refer to section 6.2.6 Regional Geology and Hydrogeology of the August 2012 EIS and supplemental information on groundwater flow and contaminant transport: http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Draft_Shallow_Groundwater_Flow_IRs.pdf ; http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/NRCAN_response_IR5_combined.pdf

Quantity section above. The reduction of groundwater discharge to the Saskatchewan River is negligible (0.006%) compared to the total flow of the River.

Shallow domestic water wells are found as close as in the James Smith Cree Nation community located eight kilometres south of the Project site. The groundwater drawdown effects would decrease the utility of some private wells in sand layers within the deeper surficial aquifers. Approximately 150 wells completed at depths of greater than 25 m within 30 km of the site could be affected. The effect on these wells will be mitigated through a program of monitoring and provision for alternate water supplies where necessary (e.g. new wells, well improvements). Local wells completed in the shallow aquifers, including those of the James Smith Cree Nation, are not expected to be affected by the dewatering of the pits because of the confining layer between the shallow and deep aquifers and recharge from precipitation.

During closure, the proponent predicts that there will be a limited reduction in the water level in the surficial aquifers in the immediate vicinity of the open pit lakes as both pits would fill with passive inflow from groundwater and precipitation. Most of the water that fills the open pits will originate from the deep (Mannville) aquifer. There is limited potential that the water from the Star Pit Lake would be discharged as springs or to the Saskatchewan River.

Groundwater Quality – During operations, groundwater quality may be affected in the area of the mine facilities through unintended or incidental releases of contaminants or the leakage of water that is stored onsite in holding facilities or used in the mine process. This affected water would flow primarily towards the Duke Ravine. To prevent seepage directly entering into the aquatic ecosystem, the proponent will install interception drainage or shallow interception. The seepage will be discharged to adjacent wetlands or sedimentation ponds for treatment¹¹ before returning to the creeks, or pumped back into the PKCF depending on water quality. At closure, excavation of the Star and Orion South pits may create a hydraulic connection between the deep (Mannville) aquifer and the surficial aquifers, thus potentially affecting groundwater quality in the immediate area around the pits.

The proponent concludes that the Project effects on groundwater would be minimal, and therefore not significant.

6.2.2 Species at Risk¹²

Canada's *Species at Risk Act* (SARA) is a federally-legislated commitment to prevent wildlife species from becoming extinct. SARA is intended to secure the necessary

¹¹ Refer to the supplemental information on wetland treatment evaluation: http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Wetland_Treatment.pdf .

¹² Refer to section 6.3.1 Fish and Aquatic Resources and section 6.3.3 Wildlife of the August 2012 EIS, and supplemental information on the fisheries assessment: http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Fisheries_Assessment.pdf.

actions for recovery of listed species and to encourage the management of other species in order to prevent them from becoming “at risk”. It provides for the legal protection of certain wildlife species and the conservation of their biological diversity.

Lake Sturgeon

The proponent identified lake sturgeon as the only likely “at risk” aquatic species present in the Project area. In 2006, the Saskatchewan River population of lake sturgeon was ranked as “endangered” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). This species however is not a listed species under SARA and a recovery plan for the Saskatchewan River sturgeon population has not yet been developed.

Initial surveys of aquatic species identified the presence of lake sturgeon in the eastern extremities of the reach of the Saskatchewan River studied. Evaluation of the habitat within the Project area revealed that lake sturgeon would unlikely reside permanently within the streams affected by the Project, although it is reported that rearing and feeding habitat is abundant in this reach of the Saskatchewan River. As this type of habitat is considered to be predominant throughout the Saskatchewan River and the Project’s effects to the river’s flow and water quality would be negligible, the proponent determined that the Project’s effects on lake sturgeon would be minor and therefore not significant. Precaution will be taken whereby all construction activities would be completed within construction timing windows specified by the DFO.

Birds

The ranges of nine avian species identified as “at risk” overlap the regional study area (RSA) defined by the proponent. The nine species are: Common Nighthawk, Olive-sided Flycatcher, Canada Warbler, Whip-poor-will, Chimney Swift, Horned Grebe, Short-eared Owl, Rusty Blackbird, and Yellow Rail.

The proponent predicted Project effects to be beneficial (through increased potential habitat created in the LSA for the Common Nighthawk and Olive-sided Flycatcher) to neutral. Neutrality of project effects on Canada Warbler, Whip-poor-will, Chimney Swift, Horned Grebe, Short-eared Owl, Rusty Blackbird, and Yellow Rail, were due to one or a combination of the following reasons:

- Species would tolerate local Project disturbances as the species is common and habitat within the RSA is not in short supply.
- Species range is at the extreme periphery of its continental range.
- Potential habitat is readily available in the RSA and LSA.
- The Project is unlikely to affect habitat availability or use by the species within the LSA or RSA.
- Potential habitat may be created during the decommissioning phase.

In mitigating potential effects on migratory birds, the proponent is committed to:

- Minimizing the clearing of vegetation;
- Conducting clearing and grading activities outside sensitive wildlife periods, and during breeding season where appropriate; and
- Minimum setback distances from active nests prescribed by EC.

After taking into account the mitigation measures discussed above, the proponent concludes that the Project's effects on the nine "at risk" avian species would be negligible and therefore not significant.

Amphibians

The Northern Leopard Frog is listed as a species of special concern by COSEWIC. It is the only amphibian species at risk that has the potential to be found in the Project area. Proposed mitigation measures include minimizing the clearing of vegetation and maintaining vegetation buffers adjacent to waterbodies where possible. The proponent may consider the possible creation of additional habitat during operation and decommissioning phases.

The proponent reports that the Project is unlikely to affect habitat availability or use by this species due to placement of project facilities away from riparian habitats and therefore concludes that the Project's effects on the Northern Leopard Frog would be negligible and therefore not significant.

Plants

Approximately 2,270 ha of habitat with high rare plant potential will be affected by the Project, where the vast majority of this area being attributed to the Jack Pine: Dry to Fresh vegetation type. Fifty occurrences of 15 rare species (i.e. species ranked extremely rare (S1 rank) by the Saskatchewan Conservation Data Centre) were documented during field inspections. There is potential for additional rare species to occur within the study area even though they were not recorded during the inspections. The Project would have an adverse direct impact to rare plants as a result of vegetation clearing. Where possible, soil salvage may help to restore the rare plant populations during progressive reclamation or at Project closure. The proponent concludes that the Project's effects would not be significant after taking into account the implementation of mitigation measures described above.

6.2.3 Fish and Fish Habitat¹³

White sucker, walleye and lake sturgeon were selected as species of importance for the environmental assessment. White sucker represents an abundant large-bodied fish that is resident in the Saskatchewan River and, to a small extent, in some tributaries within the Project area. Walleye represents a predatory fish species that is important locally to the sport fishery and Aboriginal groups. Lake sturgeon was discussed in section 6.2.2 of this document.

Construction and operation of the Project would likely result in harmful alterations, disruption, or destruction (HADD) of fish habitat. These Project activities include residual effects of drawdown from dewatering, impoundment of tributaries, and installation and removal of infrastructure such as culverts, intake and outfall/diffuser, and the widening of the White Fox Bridge. The Project would therefore be subject to Fisheries and Oceans Canada's habitat policy ensuring "no net loss".

Under Fisheries and Oceans Canada's policy, compensation often in the form of replacing lost fish habitat must be agreed to prior to the issuance of a Fisheries Act authorization which would enable a project to proceed. Conceptual information on the fish habitat compensation plan is provided in the document titled "*Shore Gold Star-Orion South Diamond Project- Fish Habitat Compensation Plan, January 13 2013*".

Further to the fish habitat compensation plan, the proponent also proposes the following measures to mitigate effects on fish and fish habitat:

- Selecting locations of project facilities that minimize direct impact on tributary streams;
- Ensuring construction activities avoid time windows for fish spawning;
- Ensuring culverts in East Ravine, Duke Ravine and 101 Ravine are sized to allow for fish passage;
- Adopting erosion control measures for erosion-prone areas of the Duke Ravine;
- Implementing mitigation measures listed in Section 6.3.1 for water quality in addressing sediment/contaminant transport; and
- Implementing mitigation measures listed in Section 6.3.1 for water quantity in addressing flow supplementation.

With implementation of habitat compensation and mitigation measures described above, the proponent concludes that the effects of the Project on fish and fish habitat would be considered low and therefore not significant.

¹³ Refer to section 6.3.1 Fish and Aquatic Resources of the August 2012 EIS, and supplemental information on the fisheries assessment: http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Fisheries_Assessment.pdf and Fish Habitat Compensation Plan: http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Fish_Habitat_Compensation_Plan.pdf.

6.2.4 Terrestrial Habitat¹⁴

The proponent conducted a vegetation impact assessment to determine Project effects on natural vegetation and terrestrial habitat. The assessment focused on old growth forest, riparian habitat, and plant species historically used by people.

The loss of natural vegetation communities during clearing activities in the FaIC Provincial Forest would be the primary direct impact of the Project on vegetation. The proponent reports that the Project would require clearing of 14% of the upland vegetation types in the local study area (LSA) prior to completion of any reclamation works and 3% of wetland vegetation types. When considered at a regional level, a total of 1% of upland vegetation and 1% of wetland vegetation would be affected.

The proponent reports that the FaIC Provincial Forest includes 4,014 hectares (ha) of old-growth forest. Project implementation would require clearing of seven hectares of this type of vegetation, which is less than 0.2% of the total of old-growth forest in the region.

The proponent proposes to minimize vegetation clearing where possible and site project facilities that avoid or minimize effects on wetlands. However progressive reclamation will be the primary means to mitigate effects of the Project on vegetation and terrestrial habitat. The proponent reports that progressive reclamation and development of the proposed pit lakes would increase upland vegetation by 100% due to revegetation of previously burned areas and wetland vegetation by 61%.

Other potential adverse effects of the Project on vegetation and wildlife habitat would include:

- Effects of dust settling out over the landscape;
- Effects of lowered groundwater levels; and
- Effects of the spread of weed species.

The proponent reports that approximately 350 hectares of sensitive vegetation would be affected by dust generated by project activities such as road traffic, pit excavation, ore handling and overburden disposal. Dust deposition on plant leaves could impact plant growth through a decrease in photosynthesis. The proponent reports that implementation of mitigation, such as dust control on roadways, would reduce the impacts substantially.

The proponent reports that lowered groundwater levels after closure of the mine could impact areas of vegetation and habitat in 1% of the wetlands in the region. The proponent expects that following the implementation of reclamation activities, groundwater levels would be restored, however affected wetland areas (bogs and fens) would recover very slowly.

¹⁴ Refer to section 6.3.2 Vegetation and Plant Communities of the August 2012 EIS.

Vegetation field studies identified 29 weed species currently existing within the project area that would be considered invasive, with nine of these species identified as “noxious”. The potential exists for certain of these weed species to proliferate through the extensive clearing and disturbance of natural vegetation during implementation of the Project. An appropriate weed management plan would be implemented by the proponent to ensure that the impact of the spread of these weed species would not become a threat to biodiversity.

With implementation of the mitigation measures described above, the proponent concludes that the effects of the Project on terrestrial habitat would be considered low to moderate but localised and reversible, and therefore not significant.

6.2.5 Wildlife and Wildlife Habitat¹⁵

Wildlife and Wildlife Habitat

The proponent’s EIS report evaluated the potential effects on wildlife and wildlife habitat of the Project’s construction, operations, closure and reclamation activities. Project effects that were considered included:

- Habitat loss or alteration;
- Sensory disturbance;
- Disruption of wildlife movement; and
- Risk of increased mortality.

Specific species of wildlife were chosen to demonstrate the Project’s effects on an array of wildlife types present within the study areas. The terrestrial indicator species included:

- Moose, as a surrogate for ungulates;
- Black bear, as a surrogate for terrestrial fur-bearers and large carnivores;
- Beaver, as a surrogate for aquatic and semi-aquatic fur-bearers; and
- Red squirrel, as a surrogate for terrestrial fur-bearers.

Birds were also considered in the evaluation of potential effects to wildlife and wildlife habitat. For the analysis, waterfowl, raptors and songbirds were considered as separate categories.

Ungulates

Effects to the ungulate populations in the FaC Provincial Forest were estimated by considering direct habitat loss (as described in Section 6.3.4 Terrestrial Habitat) and functional habitat loss at three threshold distances (250 m, 500 m and 1,000 m) from the Project footprint. Functional habitat loss is described as potential ungulate displacement

¹⁵ Refer to section 6.3.3 Wildlife of the August 2012 EIS.

resulting from the animals' tendencies to avoid project activities based on noise, vibration and perceived physical threat.

The proponent reports that moose, elk and white-tailed deer populations in the RSA are likely to experience a minor degree of effect at the local scale due to construction and operation activities and associated access. When the maximum level of disturbance was considered (100%), all ungulate populations remained within 88% of the baseline population estimate. However, ungulate response to disturbance is seldom 100% avoidance. It is more likely that ungulates would be displaced into other suitable habitat within the respective ungulate population management units, and acclimate to the disturbances.

About 32% (3,961 ha) of the LSA would experience vegetation clearing during the course of the Project. Progressive reclamation of the Project footprint during the operations phase and decommissioning phase would offset some of the direct habitat loss and potential effects of functional habitat loss. The Project effects on ungulate populations within the RSA can be mitigated through:

- Initiating construction activities outside of sensitive periods for ungulates (fall rut, late winter, and spring calving) in areas of high quality habitat when possible;
- Requesting that Saskatchewan Ministry of Environment make minor adjustments in hunting season draw quotas, season timing and bag limits within the regional ungulate population management units;
- Requesting that Saskatchewan Ministry of Environment initiate an RSA-scale access management plan to improve general habitat conditions by actively closing unnecessary trails to all forest users to reduce overall road/trail density on the landscape;
- Progressive reclamation would offset some of the direct and functional habitat loss during operations; and
- Final reclamation would replace functional habitat at closure.

With implementation of the mitigation measures described above, the proponent concludes that the effects of the Project on ungulates would be low and localised, and therefore not significant.

Black Bear

Bear habitat would be reduced by approximately 3% during the construction and operation phases and 2.6% post closure. The clearing of vegetation would be minimized where possible and progressive reclamation would offset some of the direct and functional habitat loss during operations to reduce Project effects on the bear population. The majority of the population is expected to be restored following decommissioning and reclamation. The proponent notes that the populations of black bears are currently affected by the current road/trail network within the RSA and LSA.

With implementation of the mitigation measures described above, the proponent concludes that the effects of the Project on black bears would be low and localised, and therefore not significant.

Beaver

Potential beaver habitat would be reduced by about 2.9% due to project construction and operations. The Project may have a limited local effect in the LSA on aquatic furbearer (beaver) habitat since it is at the upstream ends of seasonally flowing creeks. Some of this habitat would be regained during the closure phase of the Project (decommissioning and reclamation) resulting in a net loss of about 2.3%. Facilities would be sited to avoid direct impacts on riparian areas to the extent possible.

With implementation of the mitigation measures described above, the proponent concludes that the effects of the Project on beavers would be low/negligible and localised, and therefore not significant.

Red Squirrel

Population modeling was used to gauge the potential effect of the project on the RSA red squirrel population. Model simulations estimated a maximum reduction in the red squirrel population of between 3.3 and 3.9%. The clearing of vegetation would be minimized where possible to reduce Project effects on the red squirrel population. The majority of the population is expected to be restored following decommissioning and reclamation.

With implementation of the mitigation measures described above, the proponent concludes that the effects of the Project on red squirrel would be low/negligible and localised, and therefore not significant.

Migratory Birds

Waterfowl

Waterfowl observed in the project area include Canada goose, dabbling ducks (mallard, northern pintail, blue-winged teal, green-winged teal, bufflehead, ruddy duck) and diving ducks (ring-necked duck, lesser scaup, and common goldeneye).

About 47 ha of potential waterfowl nesting and feeding habitat occur in the LSA, as well as 375 ha along the Saskatchewan River (which may also provide staging habitat). The extent of potential waterfowl habitat in the RSA is predicted to decrease by 0.2 % (9 ha) during the operations phase of the Project. Facilities would be sited to avoid direct impacts on wetlands to the extent possible and vegetation buffers would be maintained adjacent to waterbodies where possible.

No affected wetlands are expected to be directly replaced in the same location, but up to 780.9 ha of new aquatic habitat is expected to result from lakes created at the north end

of the Star pit (353.3 ha) and Orion South pit (427.6 ha). Marsh habitat may be replaced from decommissioning of the polishing pond (1.2 ha), runoff pond (6.2 ha), and sewage lagoon (2.9 ha).

It is unlikely that the new wetlands would provide substantial waterfowl habitat value during the operations phase of the Project, but they would provide habitat value upon decommissioning. The proponent anticipates waterfowl habitat to increase by 14.2% during the decommissioning phase.

With implementation of the mitigation measures described above, the proponent concludes that the effects of the Project on waterfowl would be low/negligible and localised, and therefore not significant.

Raptors

There are historical records for 23 raptor species in the RSA. Fourteen of these species were observed during baseline surveys or through incidental observations made for the Project.

The baseline raptor surveys reported one active bald eagle nest overlooking the Saskatchewan River near the east boundary of the LSA and two horned owls observed in the LSA. No nesting raptors were detected within the LSA.

Accipiter species (golden eagle and bald eagle) are the raptors most sensitive to disturbance in the RSA. A disturbance activity buffer of 750 m from active accipiter nests should be sufficient to protect against project effects. The distance between potentially-disturbing project activities and active raptor nests exceeds this recommended buffer distance.

With implementation of the mitigation measures described above, the proponent concludes that the effects of the Project on raptors would be low/negligible and localised, and therefore not significant.

Songbirds

The Project would affect songbird communities as a result of habitat fragmentation, reduced habitat connectivity, edge effects, changes in vegetation species composition and loss of interior forest habitat. All project effects on songbirds would be local in nature.

Some bird species would respond positively to these changes and others negatively. Passerine species that favour edge habitats (e.g. olive-sided flycatcher) would likely benefit from increased access to multiple habitat types. Interior forest species (e.g. many warblers) would likely be adversely affected by the creation of edge habitats.

Adverse effects on songbirds would be minimized by avoiding forest clearing activities during the nesting season. In addition, new upland habitat would be created following decommissioning and reclamation.

With implementation of the mitigation measures described above, the proponent concludes that the effects of the Project on songbirds would be low/negligible and localised, and therefore not significant.

6.2.6 Traditional Use¹⁶

The Project is within the asserted traditional territory of James Smith Cree Nation, Muskoday First Nation, Sturgeon Lake First Nation, Red Earth First Nation and the Wahpeton Dakota Nation. Métis Nation - Saskatchewan, Eastern Region II and Métis Nation - Saskatchewan, Western Region II members also assert that they exercise their Aboriginal rights in the region.

As part of its effects assessment, the proponent reached agreements for gathering traditional knowledge information with Sturgeon Lake First Nation, Métis Nation – Saskatchewan, Eastern Region II, Métis Nation – Saskatchewan, Western Region II, Red Earth First Nation, the three bands of James Smith Cree Nation (James Smith Cree Nation, Chakastaypasin Band of the Cree, Peter Chapman First Nation), Muskoday First Nation and Wahpeton Dakota Nation.

Consistent with the agreements, six studies were completed including a joint study for the two Métis regions. The traditional knowledge studies were supported financially by the proponent to provide information for the assessment of the Project's effects on traditional land use in the FalC Provincial Forest area. A summary of the Traditional Land Use (TLU) studies conducted with the First Nations and Métis regions is presented in section 5 of the proponent's EIS.

The proponent assessed the cultural setting and heritage sensitivity of the Project area through a review of literature, databases, as well as the data collected during Heritage Resources Impact Assessments. According to the collected information, the FalC Provincial Forest area has been traditionally used for the following activities:

- Hunting (moose, elk, white tailed deer, bear, duck, geese, grouse, partridge, prairie chicken, eagle);
- Trapping (black bear, beaver, weasel, coyote, red fox, wolf, muskrat, mink, marten, otter, skunk, rabbit, squirrel, lynx);
- fishing (walleye, northern pike, perch, sucker, goldeye, burbot, whitefish, sturgeon);
- Gathering plants for medicinal, food and spiritual purposes (sage, sweet grass, seneca root, birch bark, red willow, muskeg tea, Labrador tea, mushrooms,

¹⁶ Refer to section 6.4.2 Traditional Land Use of the August 2012 EIS, and supplemental information on the Traditional Land Use of Bingo Hill: http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Traditional_Use_and_Mitigation_of_Cultural_sites_of_James_Smith_Cree.pdf and updated Traditional Land Use Assessment for the James Smith Cree Nation (Hunting): http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Updated_JSCN_Effects_Assessment_Hunting.pdf.

- blueberry, chokecherry, Saskatoon berry, highbush cranberry, cranberry, pin cherry, strawberry, raspberry, wild rice);
- Use of sites for traditional cultural activities (recreational areas, ceremonial and sacred areas, traditional gathering, hunting camps, cultural camps, grave sites); and
- Conditions for use.

Hunting

The Project has the potential to have several effects on hunting by Aboriginal people in the FaIC. There would be designated exclusion zones within the project area. As such, hunting would not be permitted within exclusion zones during the project construction and operations period. Hunting would be displaced for the life of the Project to other areas of the FaIC Provincial Forest and would resume when preferred game returns to the project area after site closure and reclamation. The proponent indicates that most hunting would be able to continue with minimal effect from displacement to nearby hunting areas.

The wildlife effects assessment indicates that the project effects on ungulates and furbearer populations within the RSA would be small, reversible and can be mitigated. Mitigation measures for ungulates would ensure populations of game are maintained at adequate levels to support hunting by Aboriginal people.

The Project would result in the long-term changes to the hunting area due to the excavation of the Star and Orion South pits. The Project area would be reclaimed for traditional use after site closure and game is expected to return to the area. Part of the area would be reclaimed as wetland, which would increase the available habitat for waterfowl. Increased employment for Aboriginal people in the surrounding communities may have a positive or negative effect on hunting by Aboriginal people. There would be increased financial resources to support hunting activities but hours dedicated to work could reduce the time available to participate in hunting activities. Overall, the proponent concludes that the Project effects on hunting would not be significant.

Trapping

Trapping was not reported to be a major activity of Aboriginal people using the FaIC Provincial Forest area, and impacts of the Project on wildlife and furbearers would be mitigated (refer to section 6.3.5 Wildlife and Wildlife Habitat). As such, the proponent concludes that the Project effects on trapping would not be significant.

Fishing

The Project may affect fishing through reduced access to fishing locations and changes to water quality and the aquatic ecosystem. Areas used for fishing by Aboriginal groups are reported in the proponent's EIS. Access to fishing locations outside of the LSA would not be affected by the Project. A possible exception is access to the Saskatchewan

River via Lars Road as this road would be re-routed. The proponent will engage Aboriginal groups to ensure access disruptions from the re-routing of Lars Road would not unnecessarily affect fishing by Aboriginal people.

A Fish Habitat Compensation Plan was developed for the areas of fish habitat affected by the Project with consideration of input received from Aboriginal groups. The proponent predicts that all project-related impacts to fish species in the Saskatchewan River would be minimal, and therefore effects to fishing would be not significant.

Gathering

Aboriginal groups have identified many areas in the FaIC that are utilized for traditional plant gathering, medicinal and spiritual plant gathering and berry picking. Plant gathering locations were identified both inside and outside of the LSA and RSA of the Project. Berry and medicinal plant harvest would be displaced from the exclusion zones for the life of the Project to other existing berry/medicinal plant areas throughout the RSA or new areas. Other berry harvest areas would remain in production, although it is likely that about 6% of James Smith Cree Nation berry harvest areas would not be accessible.

People participating in plant and berry gathering activities within 2 to 3 km of the exclusion zone may be able to hear the mine on a quiet day. The Project would remove an area used for gathering from future use. The Proponent will work with Aboriginal groups to ensure traditional production of plants and berries is a consideration in reclamation and closure planning as appropriate. Based on the analysis of project impacts and the proposed mitigation, the proponent predicts that effects on plant gathering would not be significant.

The Project's effects on country foods were assessed in the EIS. The EIS indicates that there would be negligible exposure to chemicals of potential concern through the consumption of fish, plants and berries and game.

Cultural Sites

Cultural sites include spiritual sites, camping sites or other important cultural locations on the landscape. It does not include archaeological sites. Several sites in the LSA and RSA were identified by Aboriginal people as being valued. The Project would impact these sites in several different ways: reduced access, potential removal of sites, and visual and noise effects.

Camping and other cultural sites of James Smith Cree Nation, located between the overburden and Star Pit, would be partly inaccessible or removed during project operations due to the brush barrier and other project activities. A small portion of a camping area along the Saskatchewan River would be removed from potential use by project facilities. Camping and other cultural sites near the mine may be impacted by visual and noise effects.

The proponent will work with James Smith Cree Nation to ensure that re-alignment of Lars Road does not impede access to a cabin in the area used by its members.

A large burial area was noted north of the Saskatchewan River at the end of the Melfort Ferry Road. The current pipeline route to the outfall structure would interact with the burial area. The proponent will have the pipeline area surveyed by an archaeologist pre-construction. If any burial sites are identified along the pipeline route, the proponent will re-route the pipeline to completely avoid direct impacts to the site.

The proponent concludes that socio-cultural benefits, avoidance of impacts and access management would mitigate the Project effects on these cultural sites, and as such predicts that the effects would not be significant.

Conditions for Use

Increased or decreased access to traditional lands may affect traditional land use. Transportation routes through the FaIC Provincial Forest area were identified by Aboriginal groups as important aspects of traditional land use. The exclusion zone created by the brush barrier and other project facilities would prevent access to some areas previously used for traditional production. Lars Road would be re-routed to maintain previously existing access to areas outside of the project footprint. Access along the Shipman Trail would be improved due to upgrades to the road. The proponent predicts that changes to access within the RSA would be not significant.

The Proponent will work with First Nations and Métis people and stakeholders to develop suitable access management strategies and participate in regional awareness or educational initiatives that are intended to encourage appropriate use of the FaIC Provincial Forest.

The proponent reports that it is involved in discussions with some of the individual Aboriginal groups regarding mitigation for the potential effects on traditional uses of land and resources and continues to make efforts to engage with other groups. Overall, the proponent concludes that the Project effects on conditions for use would not be significant.

6.2.7 Navigation¹⁷

The navigable waters assessment considered the Project's ability to comply with the *Navigable Waters Protection Act* (NWPA). The NWPA protects the public's right to navigate and regulates construction of works that may infringe on that right. Many of the waterways that would be impacted by the Project would be considered "minor" waters,

¹⁷ Refer to section 6.2.5 Navigation and supplemental information on the design of White Fox Bridge crossing: http://www.ceaa-acee.gc.ca/050/documents_staticpost/46277/89420/Conceptual_bridge_expansion.pdf.

which are designated as a class of waters on which a work can be undertaken without approval under the NWPA.

The Saskatchewan River is an important navigable waterway that is utilized for limited recreational purposes (e.g., canoeing and fishing). Project facilities would be located north of the river and would not alter its navigability. Since water from the river is required for the processing plant, a water intake structure would be located in the river. The design of the water intake will consider navigation impacts, and follow design and mitigation measures outlined by Transport Canada.

The outfall/intake structure will be designed to avoid disturbance of near-shore fish habitat and, in so doing, also aim to avoid interference to navigation on the Saskatchewan River. The river width (260 m) and depth (3.5 m) at the proposed outfall location would allow ample room for vessel navigation.

During installation and decommissioning of the outfall/intake structure, proper control measures would be taken to ensure that debris or other materials do not accumulate in the river and alter navigability at the site. In addition, no tools, equipment, vehicles, materials, or temporary structures used during construction, operation, or removal of the outfall structure would remain at the site after closure and decommissioning of the Project.

The proponent predicts that the effects on the navigability of the river caused by installation, operation, and decommissioning of the intake and outfall structure would not be significant.

Access Corridor

The access corridor would cross the White Fox River at the site of the current bridge on the Shipman Trail which would be widened as part of the Project. Modifications to the bridge would not alter the height of the bridge. Clearance is the most important factor to consider in protecting navigation of the waterway. Considering the current structure was designed to be of sufficient height to allow safe passage of vessels, and approval of the design was obtained from Transport Canada, the proposed crossing structure is not expected to affect navigability of the waterway.

During construction of the bridge, mitigation measures would include preventing material from entering the waterway that could interfere with the navigability of the river. This would include the use of proper erosion control measures, if needed, to ensure that sedimentation or the deposit of other materials does not occur. In addition, no tools, equipment, vehicles, materials, or temporary structures would remain at the site after construction activities at the bridge are completed. There are no plans to remove the bridge following closure and decommissioning of the Project.

The proponent predicts that the effects on the navigability of the White Fox River caused by alterations to the existing would not be significant.

7 Predicted Cumulative Environmental Effects¹⁸

The proponent considered how the effects of the Project could combine with past, present or future (reasonably foreseeable) projects. The effects remaining from earlier mining activities were accounted for in the description of the existing environment and considered during the planning and assessment of the future mine operations.

Following a review of the available information and the scope of the cumulative effects assessment, the major “foreseeable” projects/human activities that appear to overlap spatially and/or temporally with the Project include:

- Exploration drilling by the proponent;
- Expansion of the Star pit to include other kimberlite deposits;
- Extension of the Orion South pit to include inferred resources and the Orion Centre Deposit;
- SaskPower transmission line to service the Project;
- Logging/management of the provincial forest; and
- Other uses of the rerouted and upgraded access road to the site.

Cumulative incremental effects associated with human activities and projects that overlap spatially and temporally with the Project are predicted to be primarily limited to the following:

- Land disturbance associated with planned forestry activities, exploration activities and potential expansion of mining activities;
- Extension of the limited water quality effects on the Saskatchewan River from mining of additional kimberlites and continued discharge of treated water from the site; and
- Potential increase in traffic injuries from increased use of the public portion of the access road (Shipman Trail).

Mitigation measures associated with increased accessibility of the upgraded/paved Shipman Road include educating the public to exercise caution when using the road for recreational purposes because the route is frequently used by logging and traffic. Signage would be posted regarding measures to avoid conflicts (i.e., turn around locations and speed limits).

Discharge of water and the Saskatchewan River receiving environment would be closely monitored using both water chemistry sampling and aquatic effects sampling. The proponent indicates that appropriate action would be taken if concentrations of discharged substances are considerably greater than predicted by modelling, exceeds provincial and/or federal discharge requirements or if aquatic effects monitoring detects effects attributed to the Project-managed water discharge.

¹⁸ Refer to section 9.0 Cumulative Effects Assessment of the August 2012 EIS.

Land disturbance would be minimized to the extent possible during all mining, logging and exploration activities as required by the permitting agencies. Detailed closure, reclamation and revegetation/reforestation plans would be implemented where necessary taking into consideration local land use plans.

The Project may continue to provide government revenues and employment and contract benefits beyond the timeframe originally proposed if all future developments are completed.

8 Follow-up Program and Monitoring

In accordance with the Act, the follow-up program is designed to verify the accuracy of environmental assessment predictions and determine the effectiveness of mitigation measures. It can also support the implementation of adaptive management strategies designed to respond to unanticipated environmental effects. Responsible authorities ensure that all appropriate mitigation measures are implemented and ensure the implementation of any follow-up program requirements identified in the CSR. To fulfill this obligation, responsible authorities may rely on commitments made through provincial actions, commitments made by the proponent or its own regulatory actions.

For this comprehensive study, follow-up program components in relation to air quality; noise; terrain and soils disturbance; vegetation, wildlife and wildlife habitat; hydrology, surface water quality; groundwater quality and quantity; aquatic effects, sediment, reclamation and re-vegetation, geochemical stability; and geotechnical stability are being considered.

Where monitoring commitments made through the environmental assessment process are not covered by specific federal or provincial regulatory instruments, an environmental management agreement may be developed between the federal and provincial authorities, the proponent and potentially other parties.

9 Conclusion

The environmental effects of the Project, as summarized in this document, have been determined using generally-accepted environmental assessment methodology. The proponent has concluded in its EIS report that, providing the identified mitigation measures are implemented, the Project can be constructed, operated and decommissioned without causing significant adverse effects, including cumulative effects and the effects of accidents and malfunctions.

10 Next Steps

The Agency will prepare a CSR based on the information contained in the EIS report and comments received from technical experts, Aboriginal groups and the public. The CSR will provide a summary of information and analysis that the Agency will consider in

reaching its conclusion on whether the project is likely to result in significant adverse environmental effects. The Minister of the Environment will consider the CSR and comments received from Aboriginal groups and the public when issuing the Environmental Assessment Decision Statement.

The Minister may request additional information or require that public concerns be addressed before issuing the environmental assessment Decision Statement. Following its issuance, the Minister will refer the Project back to DFO, TC and NRCan to allow the appropriate course of action decision to be taken.

11 Comments

At this time, the Agency is seeking comments from Aboriginal groups and the public on this EIS Summary. Persons wishing to submit comments may do so in writing to:

Star-Orion South Diamond Project
Canadian Environmental Assessment Agency
425, 10115-100A Street
Edmonton, Alberta T5J 2W2
Facsimile: 780-495-2876
E-mail: StarOrionDiamondProject@ceaa-acee.gc.ca

Comments received **by September 13, 2013** will be considered.

Please clearly reference the Star-Orion South Diamond Project and the Canadian Environmental Assessment Registry file number 46277 in your submission. Also note that all comments received are considered public and will become part of the public registry.

12 Glossary

AANDC	Aboriginal Affairs and Northern Development Canada
Act	Canadian Environmental Assessment Act
Agency	Canadian Environmental Assessment Agency
CEARIS	Canadian Environmental Assessment Registry Internet Site
Coarse PK	Coarse processed kimberlite (pile)
CSR	comprehensive study report
DDAC	Diamond Development Advisory Committee
DFO	Fisheries and Oceans Canada
EC	Environment Canada
EIS	Environmental Impact Statement
EPP	environmental protection plan
FA	Federal authority
FaIC	Fort à la Corne
ha	hectare
HADD	Harmful alteration, disruption or destruction (to fish habitat)
HC	Health Canada
km	kilometre
LSA	local study area
m³/a	cubic metres per year
NRCan	Natural Resources Canada
NWPA	Navigable Waters Protection Act
PKCF	Processed kimberlite containment facility
RA	responsible authority
RSA	regional study area
SAR	species-at-risk
SARA	Species at Risk Act
t	tonne
TC	Transport Canada
TEK	traditional ecological knowledge
TK	traditional knowledge
TLU	traditional land use
TSS	total suspended solids
VC	valued component

VEC
VSEC

valued ecosystem component
valued socio-economic component

13 Appendix A: Environmental Effects and Mitigation Table

Summary of Shore Gold Inc.'s Analysis on the Potential Environmental Effects and Proposed Mitigation Measures of the Star-Orion South Diamond Project

Environmental Components	Project Components	Potential Environmental Effects	Proposed Mitigation Measures	Residual Effects After Mitigation
Water Quality & Quantity	<ul style="list-style-type: none"> • Vegetation clearing • Pit excavation • Pit dewatering • Overburden and rock piles, processed kimberlite piles (PKCF and Coarse PK) • Water and wastewater management • Processing plant and facilities • Installation, operation and removal of water intake and outfall/diffuser structures in the Saskatchewan River • White Fox River bridge crossing modifications 	<ul style="list-style-type: none"> • Change in water quality due to changes in sediment quality • Discharge into the Saskatchewan River could reduce water quality • Change in surface water flows due to pit-dewatering/drawdown, surface water diversions from impoundment and water withdrawal from and discharge to the Saskatchewan River • Change in groundwater quality and quantity from pit dewatering/aquitard removal (operations) and in-pit lake filling (closure) 	<ul style="list-style-type: none"> • Use of erosion and sediment control measures and best practices to limit transport of sediment /contaminants into watercourses • Progressive reclamation of overburden to limit erosion • Surface water diversion around the pits, with retention and drainage structures • Water from the PKCF will be recycled to the process plant • Seepage from the PKCF will be captured by drainage ditches or interception wells and directed to wetlands for treatment or sedimentation ponds, or returned to the PKCF • Other site runoff, including runoff from plant site, inflows from the Star Pit and precipitation are captured by drainage ditches and pumped to the PKCF for management • Wastewater from domestic use will be treated in a two-stage lagoon and treated according to regulatory standards prior to discharge • Final discharge to the Saskatchewan River will be monitored and meet government requirements for end-of-pipe water quality • Supplementation of low flows in English Creek, Duke Ravine and 101 Ravine, if needed to maintain fish habitat • Groundwater monitoring plan to identify and address impacts on privately owned wells, and implementation of appropriate mitigation measures (e.g. installing a new well, providing water) if needed • Natural watershed boundaries will be restored at closure • Pit lakes will be naturally filled with groundwater at closure, stabilising and restoring groundwater flows 	<ul style="list-style-type: none"> • Effects on water quality on tributaries and the Saskatchewan River are minor and within the natural range of variability. Therefore the effects would not be significant. • Effects on the Saskatchewan River's net flows are negligible and therefore would not be significant. • Effects on groundwater would not affect groundwater users and surface water quality and flows of the Saskatchewan River. Therefore the effects would not be significant.

Environmental Components	Project Components	Potential Environmental Effects	Proposed Mitigation Measures	Residual Effects After Mitigation
Species at Risk: Lake Sturgeon	<ul style="list-style-type: none"> Installation, operation and removal of water intake and outfall/diffuser structure in Saskatchewan River 	<ul style="list-style-type: none"> Impact to feeding and rearing habitat Discharge into the Saskatchewan River could reduce water quality, and thereby impact lake sturgeon 	<ul style="list-style-type: none"> All construction activities would be completed within construction timing windows specified by DFO Mitigation measures identified under "Water Quality & Quantity" for addressing sediment/contaminant transport and flow supplementation 	<ul style="list-style-type: none"> Effects are negligible and therefore would not be significant.
Species at Risk: Migratory Birds	<ul style="list-style-type: none"> Vegetation clearing Construction & operation of facilities 	<ul style="list-style-type: none"> Potential increase in habitat for common nighthawk and olive-sided flycatcher Neutral effect on other species Disturbance and avoidance due to noise 	<ul style="list-style-type: none"> Clearing of vegetation would be minimized Vegetation clearing conducted outside of nesting and breeding season where appropriate Use of minimum setback distances from active nests prescribed by EC 	<ul style="list-style-type: none"> Effects are negligible and therefore would not be significant.
Species at Risk: Northern Leopard Frog	<ul style="list-style-type: none"> Vegetation clearing Construction & operation of facilities 	<ul style="list-style-type: none"> Disturbance due to noise Removal of habitat during construction 	<ul style="list-style-type: none"> Clearing of vegetation would be minimized Vegetation buffers would be maintained adjacent to waterbodies where possible Possible creation of additional habitat during operation and decommissioning phases 	<ul style="list-style-type: none"> Effects are negligible and therefore would not be significant.
Species at Risk: Plants	<ul style="list-style-type: none"> Vegetation clearing Construction of facilities 	<ul style="list-style-type: none"> Direct loss of rare plant species 	<ul style="list-style-type: none"> Destruction of rare plants would be avoided where possible Soil salvage and direct placement may restore rare plant populations during progressive reclamation or at project closure. 	<ul style="list-style-type: none"> Effects are localised and therefore would not be significant.
Fish and Fish Habitat	<ul style="list-style-type: none"> Development of Star pit in the East Ravine Installation, operation and removal of water intake and outfall/diffuser structures in the Saskatchewan River Construction of crossings in the Duke and 101 Ravines White Fox River bridge crossing modifications Decommissioning of project facilities 	<ul style="list-style-type: none"> Habitat loss in upper reaches of West Ravine and East Ravine due to development of Star pit Habitat loss due to culverts placed in East Ravine, Duke Ravine and 101 Ravine Surface runoff from overburden, rock storage, PKCF and Coarse PK piles Potential adverse effects on fish habitat during White Fox bridge widening Potential effects of discharge into the Saskatchewan River on aquatic species 	<ul style="list-style-type: none"> A Fish Habitat Compensation Plan has been developed with DFO to demonstrate no net loss of fish habitat from the removal of East Ravine, the residual effects of potential changes to flow in fish bearing streams, and construction and removal of infrastructure (culverts, bridge widening) Locations of project facilities were selected to minimize direct impact on tributary streams Culverts in Duke Ravine and 101 Ravine would be sized to ensure fish passage Mitigation measures identified under "Water Quality & Quantity" for addressing sediment/contaminant transport and flow supplementation 	<ul style="list-style-type: none"> Effects can be compensated for and therefore would not be significant.

Environmental Components	Project Components	Potential Environmental Effects	Proposed Mitigation Measures	Residual Effects After Mitigation
			<ul style="list-style-type: none"> Flows to the lower reaches of East Ravine will be re-established following project closure 	
Terrestrial Vegetation: Old Growth Forest and Riparian Habitat	<ul style="list-style-type: none"> Vegetation clearing Development of mine pits Overburden and rock pile, processed kimberlite piles (PKCF and Coarse PK) Processing plant and facilities 	<ul style="list-style-type: none"> Loss of natural vegetation communities Spread of weed seeds Effects of dust and emissions on vegetation Removal of wetlands 	<ul style="list-style-type: none"> Progressive reclamation and development of pit lakes Clearing of vegetation would be minimized A weed management strategy would be implemented Appropriate dust control measures would be implemented Facilities would be sited to avoid direct impacts on wetlands where possible Restoration of water tables affected by drawdown following progressive reclamation and development of the proposed pit lakes 	<ul style="list-style-type: none"> Effects are low to moderate, localised and reversible, and therefore would not be significant.
Wildlife and Wildlife Habitat: Moose (surrogate for ungulates)	<ul style="list-style-type: none"> Vegetation clearing Development of mine pits Overburden and rock pile, processed kimberlite piles (PKCF and Coarse PK) Processing plant and facilities 	<ul style="list-style-type: none"> Loss or alteration of upland and riparian habitat Disruption of wildlife movements Disturbance and displacement of animals due to noise Reduced habitat quality due to deposition of dust and contaminants Increased mortality risk from vehicle collisions Displacement due to potential increase in recreation activities Effect on habitat effectiveness, disruption of movement patterns, movement corridors 	<ul style="list-style-type: none"> Construction activities would be scheduled to avoid sensitive periods (fall rut, late winter, spring calving) where possible Saskatchewan Ministry of Environment would be requested to adjust hunting season draw quota, season timing and bag limits within regional ungulate population management units Saskatchewan Ministry of Environment would be requested to reduce road and trail density by closing unnecessary trails Progressive reclamation would offset some of the direct and functional habitat loss during operations Final reclamation would replace functional habitat at closure 	<ul style="list-style-type: none"> Effects are low and localised, and therefore would not be significant.
Wildlife and Wildlife Habitat: Black Bear (surrogate for terrestrial fur-bearers and large carnivores)	<ul style="list-style-type: none"> Vegetation clearing Development of mine pits Overburden and rock pile, processed kimberlite piles (PKCF and Coarse PK) Processing plant and facilities 	<ul style="list-style-type: none"> Loss or alteration of upland and riparian habitat Disturbance and displacement of animals due to noise Reduction in population size due to habitat loss and increased access to hunters 	<ul style="list-style-type: none"> Clearing of vegetation would be minimized Progressive reclamation would offset some of the direct and functional habitat loss during operations Final reclamation would replace functional habitat at closure 	<ul style="list-style-type: none"> Effects are low and localised, and therefore would not be significant.
Wildlife and Wildlife	<ul style="list-style-type: none"> Vegetation clearing Development of mine pits 	<ul style="list-style-type: none"> Loss or alteration of habitat in tributary streams 	<ul style="list-style-type: none"> Facilities would be sited to avoid direct impacts on riparian areas to the extent possible 	<ul style="list-style-type: none"> Effects are low/negligible and localised, and

Environmental Components	Project Components	Potential Environmental Effects	Proposed Mitigation Measures	Residual Effects After Mitigation
Habitat: Beaver (surrogate for aquatic and semi-aquatic fur-bearers)	<ul style="list-style-type: none"> • Overburden and rock piles, processed kimberlite piles (PKCF and Coarse PK) • Processing plant and facilities 	<ul style="list-style-type: none"> • Reduction in population size due to habitat loss 	<ul style="list-style-type: none"> • Progressive reclamation would offset some of the direct and functional habitat loss 	therefore would not be significant.
Wildlife and Wildlife Habitat: Red Squirrel (surrogate for terrestrial fur-bearers)	<ul style="list-style-type: none"> • Vegetation clearing • Development of mine pits • Overburden and rock pile, processed kimberlite piles (PKCF and Coarse PK) • Processing plant and facilities 	<ul style="list-style-type: none"> • Loss or alteration of upland habitat • Reduction in population size due to habitat loss 	<ul style="list-style-type: none"> • Clearing of vegetation would be minimized • Progressive reclamation would offset some of the direct and functional habitat loss 	<ul style="list-style-type: none"> • Effects are low/negligible and localised, and therefore would not be significant.
Wildlife and Wildlife Habitat: Waterfowl	<ul style="list-style-type: none"> • Vegetation clearing • Development of mine pits • Overburden and rock pile, processed kimberlite piles (PKCF and Coarse PK) • Processing plant and facilities 	<ul style="list-style-type: none"> • Loss or alteration of habitat in tributary streams • Reduction in population size due to habitat loss 	<ul style="list-style-type: none"> • Facilities would be sited to avoid direct impacts on wetlands to the extent possible • Vegetation buffers would be maintained adjacent to waterbodies where possible • Aquatic habitat would be created following decommissioning and reclamation 	<ul style="list-style-type: none"> • Effects are low/negligible and localised, and therefore would not be significant.
Wildlife and Wildlife Habitat: Raptors	<ul style="list-style-type: none"> • Vegetation clearing • Development of mine pits • Overburden and rock pile, processed kimberlite piles (PKCF and Coarse PK) • Processing plant and facilities 	<ul style="list-style-type: none"> • Potential loss of critical habitat for nesting • Disturbance and displacement due to noise 	<ul style="list-style-type: none"> • A disturbance activity buffer of 750 m from active nests would be observed 	<ul style="list-style-type: none"> • Effects are low/negligible and localised, and therefore would not be significant.
Wildlife and Wildlife Habitat: Songbirds	<ul style="list-style-type: none"> • Vegetation clearing • Development of mine pits • Overburden and rock pile, processed kimberlite piles (PKCF and Coarse PK) • Processing plant and facilities 	<ul style="list-style-type: none"> • Loss or alteration of upland habitat • Reduction in population size due to habitat loss • Potential reduction in species diversity • Reduced habitat quality 	<ul style="list-style-type: none"> • Clearing of vegetation would be minimized • Upland habitat would be created following decommissioning and reclamation 	<ul style="list-style-type: none"> • Effects are low/negligible and localised, and therefore would not be significant.
Current Use of Lands and Resources for Traditional Purposes	<ul style="list-style-type: none"> • Physical disturbances to the landscape • Vegetation clearing • Development of mine pits 	<ul style="list-style-type: none"> • Adverse effects on traditional land uses such as hunting wildlife and waterfowl, fishing, trapping, logging and harvesting medicinal, spiritual and edible plants 	<ul style="list-style-type: none"> • Measures for mitigating effects of the Project on fish, wildlife, and their habitats would also mitigate adverse effects on traditional land use • Re-routing pipeline to avoid direct impacts on cultural sites 	<ul style="list-style-type: none"> • Effects on hunting, trapping, fishing, gathering, cultural sites, and conditions for use

Environmental Components	Project Components	Potential Environmental Effects	Proposed Mitigation Measures	Residual Effects After Mitigation
	<ul style="list-style-type: none"> • Overburden and rock pile, processed kimberlite piles (PKCF and Coarse PK) • Processing plant and facilities • Changes to transportation routes • Changes to access in the LSA and RSA during operations • Increase in non-Aboriginal people using traditionally-used lands and resources 	<ul style="list-style-type: none"> • Interference with use or loss of trails and water navigation routes, camps and cabins and culturally important areas • Reduction in enjoyment of traditional lands due to noise and altered aesthetics • Reduction in quality of country foods due to contamination • Reduced or altered access to areas used for traditional purposes • Reduction in harvest due to competition with non-Aboriginal hunters 	<ul style="list-style-type: none"> • Development of an access management strategy with affected stakeholders and Aboriginal groups • Participation in regional awareness or educational initiatives in appropriate use of the FaIC Provincial Forest • Agreements may be established to offset some adverse effects (e.g. supporting programs, facilitating appropriate activities, etc.) • The proponent is committed to further dialogue with Aboriginal groups about identifying and reducing or managing adverse effects 	<p>would not be significant</p>
Navigation	<ul style="list-style-type: none"> • White Fox River bridge crossing modifications • Installation, operation and removal of water intake and outfall/diffuser structures in the Saskatchewan River 	<ul style="list-style-type: none"> • Potential interference with navigation 	<ul style="list-style-type: none"> • During bridge modification, measures to prevent materials from entering the waterway would be implemented, including erosion control measures • Outfall and intake design and installation method would avoid interference with navigation • During installation and decommissioning of the outfall/diffuser and intake structures, measures would be taken to ensure that debris and other materials do not enter the river and alter site navigability 	<ul style="list-style-type: none"> • Effects are low/negligible and therefore would not be significant