
***TECHNICAL REVIEW COMMENTS
on the Environmental Impact Statement***

***Shore Gold Inc.
Star-Orion South
Diamond Project***

Prepared by
Saskatchewan Ministry of Environment
Environmental Assessment Branch
January 2015

TABLE OF CONTENT

- Acronyms.....ii
- Preface.....iii
- 1. Environmental Assessment and Review Process..... 1**
 - Introduction..... 1
 - Submission of the Environmental Impact Statement..... 2
 - Technical Review.....2
 - Public Review.....3
 - Ministerial Decision..... 3
- 2. Summary of Proposed Project..... 3**
 - Alternatives Considered..... 5
- 3. Technical Review Comments..... 7**
 - Introduction..... 7
 - Public, First Nations and Metis Engagement Feedback and Response.....7
 - Biophysical Impacts..... 9
 - Terrestrial Environment*.....9
 - Water and Aquatic Environment* 12
 - Atmospheric and Acoustic Environment*.....15
 - Residual and Cumulative Effects*.....17
 - Effects of the Environment*.....17
 - Heritage and Socio-Economic Considerations..... 18
 - Heritage Resources*.....18
 - Cultural Considerations*..... 18
 - Socio-Economic Considerations*19
 - Decommissioning, Reclamation and Abandonment Plan..... 20
- 4. Conclusions..... 21**
 - Invitation to comment..... 21
 - Contact.....21

Acronyms

the Act	<u>The Environmental Assessment Act</u> (Saskatchewan)
CEAA	The Canadian Environmental Assessment Agency
EAB	Environmental Assessment Branch
EIS	Environmental Impact Statement
FaIC forest	Fort à la Corne Provincial Forest
JSCN	James Smith Cree Nation
the ministry	Saskatchewan Ministry of Environment
PK	processed kimberlite
PKCF	processed kimberlite containment facility
proponent	individual or company undertaking a development
PSGs	Project Specific Guidelines
RSA	regional study area
SEARP	Saskatchewan Environmental Assessment Review Panel (technical reviewers)
Shore Gold	Shore Gold Inc.
TLU	traditional land use
TORs	Terms of Reference
TRCs	Technical Review Comments
VCs	Valued components

Preface

This document is provided by the Environmental Assessment Branch (EAB) of Saskatchewan Ministry of Environment (the ministry) as supporting information for the public review of the Shore Gold Inc. (Shore Gold) Environmental Impact Statement (EIS) for the proposed Star-Orion South Diamond Project (the Project). The Project is located in the Fort à la Corne Provincial Forest (FalC forest) approximately 65 kilometers east of Prince Albert, Saskatchewan. Shore Gold is proposing to construct, operate and decommission an open pit diamond mine consisting of two open pits (Star and Orion South), processing and tailings facilities, and associated infrastructure.

This document has four major sections:

The first section provides an overview of the provincial environmental assessment and review process. It outlines the events and activities that led to the EIS being released for public review and describes how the public can provide comments to the Minister of Environment (the Minister) on the proposed Project.

The second section provides a brief summary of the Project. This summary is intended to provide information to assist the reader in deciding whether they are interested in finding out more about the Project. It is not intended to be a full representation of the Project. Interested readers should visit a review centre to read the EIS for the Project (locations are listed in section 4).

The third section of the document provides the ministry's evaluation of Shore Gold's conclusions regarding the predicted impacts of the proposed Project, the effectiveness of any identified mitigative measures and any follow-up requirements that would be placed on Shore Gold by the Minister, should the Project be approved.

The fourth section presents the conclusions reached by the ministry and invites the public to comment. The Minister, when making the final decision regarding the environmental acceptability of the proposed Project considers both the public's comments and Technical Review Comments (TRCs).

1. Environmental Assessment and Review Process

Introduction

The Environmental Assessment Act (the Act) in Saskatchewan requires the proponent of a project that has been deemed a “development” pursuant to section 2(d) of the Act to conduct an Environmental Impact Assessment (EIA). The EIA provides information needed by the Minister responsible for the Act (Minister of Environment) to determine whether, from an environmental perspective, a proposed project should be allowed to proceed and, if so, under what conditions. As part of the environmental assessment process, a proponent is required to prepare an EIS that documents the assessment and conclusions on the potential environmental effects of a proposed project. The EIS also describes the measures a proponent plans to take to reduce negative effects and enhance positive environmental impacts. Once completed, the EIS undergoes both a technical and public review prior to a decision being made by the Minister regarding the project.

The EIA review process provides a broad understanding of potential environmental impacts associated with a project and the measures proposed to mitigate their effects.

The purpose of the environmental assessment and review process is to ensure that adequate environmental safeguards are in place before a project is allowed to proceed and that it proceeds in a manner understood and broadly accepted by the public. These safeguards may arise out of the actual design and nature of the proposed project or, should the project receive approval under the Act, as a result of ongoing regulatory involvement by government agencies.

In addition to the Act, this Project may be subject to the following Acts, regulations and guidelines:

- The Environmental Management and Protection Act;
- The Water Regulations;
- The Mineral Industry Environmental Protection Regulations;
- The Mineral Disposition Regulations;
- The Clean Air Act and The Clean Air Regulations; and
- The Hazardous Substances and Waste Dangerous Goods Regulations.

In addition, chapters of the Saskatchewan Environmental Code and related legislation relevant to the Project are expected to come into effect in 2015. Other provincial and federal agencies also have legislation and regulations which may be applicable to the Project.

Submission of the Environmental Impact Statement

In November 2008, the EAB received a technical proposal for the Project. Following technical review the proposed Project was declared a “development” as defined in the Act and Shore Gold was therefore required to conduct an EIA. In accordance with the Canada-Saskatchewan Agreement on Environmental Assessment Cooperation (2005) Shore Gold’s proposal was provided to the Government of Canada for review. The Canadian Environmental Assessment Agency (CEAA) determined that a federal assessment was also required. Project Specific Guidelines were developed by EAB to assist Shore Gold in conducting their EIA and developing the EIS.

The EAB concluded that the proposed Project would restrict access to areas where First Nations/Métis communities are known to practice traditional uses triggering the Crown’s duty to consult (DTC). Potentially affected First Nations and Métis communities were notified by the EAB of the EIA and the DTC requirement. Shore Gold was directed to meet with potentially affected First Nations and Métis communities to inform them about the Project and solicit feedback on the potential impacts on the resources required to hunt, fish and trap for food and carry out traditional land use activities. Public notification of the requirement for an EIA was published in July 2009.

Technical Review

Technical review provides the government perspective on the proposed development.

The first draft of the EIS was received in December 2010 and was reviewed by provincial and federal reviewers and regulators to ensure that potential environmental issues (including biophysical, social and economic) had been identified and adequately addressed. The technical review identified several environmental and technical issues that required revisions and additional clarification before the EIA process could proceed to the public review of the EIS. Following revisions of the draft EIS, a revised EIS was prepared and submitted by Shore Gold in August 2012. Upon review of the 2012 revised EIS, questions remained and additional information was requested by both provincial and federal reviewers. Shore Gold provided responses to the province in February 2013. However, due to the large number of supplementary documents submitted separate from the draft EIS and the additional deficiencies identified during technical review of the documents, EAB requested that Shore Gold compile all the documents with the additional requested information into one revised EIS. A revised EIS was submitted in August 2014 and, following further clarification from Shore Gold on several points, was judged to contain adequate information to proceed with public review.

This TRC document has been prepared pursuant to section 11 of the Act and is meant to assist the public and government decision-makers in their review of the EIS. The TRCs represent a summary evaluation of Shore Gold’s EIS. In

preparing TRCs, the ministry focuses on those factors that are considered to be of primary significance with respect to the proposed Project and the environment in the area of the Project.

Public Review

Public is invited to comment on the Shore Gold Star – Orion South Diamond Project EIS for a 60 day period ending Wednesday, March 18, 2015.

Pursuant to section 12 of the Act, both the EIS and TRCs are made available for public inspection for a period of not less than 30 days. Pursuant to section 12(b) of the Act, the Minister may extend the 30 day public review period an additional 30 days, when considered appropriate. The public review period for the Shore Gold Project has been extended to 60 days. During the 60 day review period, members of the public may make written submissions to the ministry regarding the EIA and information provided in the EIS and associated documents. Interested readers should visit a review centre or the ministry website (saskatchewan.ca/environmentalassessment) to review the EIS for the Project (locations are listed in section 4).

Ministerial Decision

The Minister considers both the public and technical review comments when making a decision.

Information generated during the public and technical reviews of the EIS will be submitted to the Minister of Environment for consideration. The Minister, under section 15 of the Act, may give ministerial approval to proceed with the development, with any terms and conditions that the Minister considers necessary or advisable, or the Minister may refuse to approve the development as proposed and will provide reasons for the decision.

2. Summary of Proposed Project

Information in this section is taken from the Project EIS and is neither comprehensive nor inclusive of the information contained in that document. Please refer to the Executive Summary and the EIS main document and annexes for complete information. Section 2.0 of the EIS provides detailed information regarding the proposed Project with additional details regarding the environmental baseline studies, impact assessments and residual effects assessments in sections 5, 6 and 8, respectively. Please note that all numbered sections and appendices referenced from this point forward refer to the EIS.

Shore Gold is proposing to construct, operate and decommission an open pit diamond mine approximately 65 km east of Prince Albert in the FaC forest. FaC forest is an island forest of 132,502 hectares surrounded by agricultural land. The area provides suitable habitat for a variety of wildlife species including elk, moose, white-tailed deer, black bears, beaver and muskrat. The forest supports both non-traditional recreational activities and traditional First Nation and Métis land use activities.

Several kimberlite (rock sometimes containing diamonds) deposits including the Star and Orion South kimberlites occur in the area immediately north of the Saskatchewan River downstream of the convergence of the North and South Saskatchewan Rivers. The proposed mine's southern edge would be set back 300 m from the Saskatchewan River. Approximately 45,000 tonnes of kimberlite rock per day would be excavated from the Star and Orion South pits which would have an eventual depth of about 320 m and 300 m, respectively. Pit de-watering would be an ongoing process with the groundwater being discharged into the Saskatchewan River, if quality permits, or used in kimberlite processing. However, water quality modelling results presented in Appendix 2-F suggest that approximately 96% of the required process water would be supplied by the Saskatchewan River. The Project would also include overburden and rock storage piles, coarse processed kimberlite pile, processed kimberlite containment facility, processing plant and associated infrastructure.

Extraction of diamonds from kimberlite generates waste rock that creates dust and leachate with the potential to impact the environment. Shore Gold evaluated the characteristics of the waste kimberlite in section 5.2.3. Based on analysis of kimberlite samples, Shore Gold concluded that most rock is not acid generating and would not produce drainage that could acidify soils. However some samples of the recovery rejects, rock left after diamond extraction, had higher sulphur levels and so might be expected to leach some acid.

Levels of chromium (Cr) and nickel (Ni) in kimberlite samples were higher than levels in the Canadian Council of Ministers of the Environment (CCME) Soil Quality Guidelines for the Protection of the Environment and Human Health. Following analysis of potential dust deposition, the proponent concluded that Cr and Ni levels in the soil surrounding the site would likely remain below guideline levels as a large proportion of dust would come from other materials more similar to the soil, and dust would be washed into and diluted by existing soils. While the proponent does not expect acidification or metal contamination of soil to be an issue, they commit to developing a containment and treatment plan if monitoring indicates guideline exceedances.

Shore Gold also conducted leaching tests and found that metals, including Cr, Ni, aluminum, arsenic, lead, molybdenum and selenium could potentially leach at levels higher than the Saskatchewan Surface Water Quality Objectives and CCME objectives for protection of aquatic life. Mitigation proposed in the EIS includes monitoring quality of process and seepage water and modelling indicated that metals in discharged water would not likely exceed guideline or background levels. See *Surface Water* in section 3 of this document for additional discussion concerning surface water quality.

Surface water management at the site during construction and operation would involve employing a diversion water collection system. This system would include settling and polishing ponds to remove sediment from water before it is discharged into natural drainages to supplement flow or into the Saskatchewan

River. The potential impacts associated with discharge of waste water were assessed as part of the EIS for this Project.

The Project duration from construction to completion of mining would be in excess of 20 years with a maximum footprint of 3,945.7 hectares.

Decommissioning and reclamation of the site would occur progressively, as possible, with removal of infrastructure at the end of mining. The site would be recontoured and revegetated with the Star and Orion pits allowed to fill naturally with groundwater. The Star pit would have been partially filled in with processed kimberlite and overburden from the Orion South pit.

Accelerating reclamation by actively filling the pits using Saskatchewan River water is proposed in the EIS as an option that could be considered by Shore Gold and regulators during the decommissioning phase.

Alternatives Considered

Alternatives considered for the Project are presented in section 3.0. This section discusses the consideration of alternatives related to several Project components including mining method, waste kimberlite management and water management options. In determining these alternatives, the proponent considered both the economic and technical factors as well as expected short-term (during operations) and long-term (after decommissioning) effects of the activity. The ministry is satisfied with the preferred options presented in the EIS.

Mining Method

Section 3.3 presents two alternatives for mining the kimberlite; open pit and underground. Shore Gold opted for open pit mining instead of underground mining based on their economic evaluation of mining the deposit. Although an underground mine would likely have a smaller surface footprint, the proponent states that moving the large amount of rock using current underground mining techniques would not have been financially viable.

Waste Kimberlite Management

In Section 3.4 of the EIS, Shore Gold evaluated several options for managing waste kimberlite. A constructed management area was chosen as the preferred option for storage of processed kimberlite (PK) due to the lack of any natural geological features suitable for waste storage and containment. The footprint of the processed kimberlite containment facility (PKCF) was designed to minimize direct impacts to waterways and riparian areas. The PKCF would be unlined with seepage and runoff being collected in drainage ditches keyed into underlying clay, if available, or a subsurface drainage and pumping system.

Once mining has ceased in the Star pit, fine PK and process water from milling Orion South kimberlite would be placed in the Star pit. Additional room may be available in the Star pit to backfill a portion of the overburden from the last

mining phase of Star or from Orion South. Shore Gold proposes that the PKCF would not need to be used past year 16 of the mine's life.

Several options for management of fine PK were examined. First, a decision was made about whether or not to thicken the fines. Thickening involves removing water, usually to reuse it in processing where water supply is limited. Due to the surplus of water being produced by dewatering the pits and the fact that thickened fines can have settlement and consolidation issues, Shore Gold chose not to use a thickening circuit in their design. Second, placement of the fine PK was evaluated. All fines from both pits could be placed in the PKCF, thereby requiring a larger PKCF, or fines from the Orion South pit could be placed into the already completed Star pit. Shore Gold considered placement of Orion South fines into the Star pit as the better option for economic and environmental reasons.

Coarse PK storage was initially proposed for the east side of the plant. The revised EIS presents the preferred option as northeast of the plant where direct impacts to watercourses and riparian habitat can be avoided. The revised footprint of the coarse PK area is also smaller due to engineering refinements.

Water Management

Section 3.5 examines alternatives considered for water management. The Project process plant would require 68,900 m³ of water per day. Three water sources for the proposed processing plant were considered; deep groundwater, surficial (shallow) groundwater and a combination of Saskatchewan River water and deep groundwater from pit dewatering. Deep groundwater alone was determined to contain too much iron for the recovery portion of the processing process. Surficial groundwater was also not considered a feasible option as the aquifers would not provide adequate amounts of water. Shore Gold decided that a combination of Saskatchewan River water, deep groundwater from the pit dewatering and recycled PKCF water would allow for flexibility in water quantity and quality.

The Project would produce waste water from several sources including: kimberlite processing, site runoff and pit dewatering. Three options were examined for managing the waste water. Two of the options involved a constructed water reservoir and utilization of natural ravines to manage water from both pit dewatering and processing. A third option utilized the PKCF as a water reservoir for the process water and provided for discharge of dewatering water, in excess of that required in the processing circuit, to the Saskatchewan River. Regular water quality monitoring would be conducted to ensure water quality guidelines and regulations are met. The third option was selected to minimize costs, provide better water control, avoid direct impacts to natural water courses and minimize overall footprint.

3. Technical Review Comments

Introduction

The intent of the technical review phase of the environmental assessment and review process is to give provincial subject matter experts from across multiple government agencies and ministries an opportunity to examine the EIS to:

- Develop their opinions about how adequately the environmental issues related to the Project have been characterized and addressed; and,
- Determine whether the information provided is sufficiently complete and technically accurate enough to support the public review phase of the process.

The technical review of the EIS identified issues related to potential environmental impacts and environmental management that required clarification. These issues were addressed with additional information and the results were presented in the final EIS submission. Upon further review, the final EIS was considered to contain adequate information to proceed with public review.

Release of the EIS for public review should not be interpreted as absolute agreement with all items within the EIS. Rather that remaining issues can be handled through regulatory and permitting activities or terms and conditions that may be imposed in a decision made pursuant to the Act if the Project is approved.

In general, Shore Gold has addressed the significant issues raised during review of the initial EIS submissions. Further refinement of Project technical details would be developed in conjunction with regulators at the time of licensing should the development receive ministerial approval.

Public, First Nations and Métis Engagement Feedback and Response

Section 4.0 provides details on Shore Gold's engagement with the public and First Nations and Métis communities. Shore Gold initiated engagement activities in November 2008 to inform potential stakeholders about the Project through various media, open houses, site tours, workshops and a webpage. In particular, Shore Gold engaged with the Diamond Development Advisory Committee, a community stakeholder group that served as a liaison between Shore Gold and urban, rural, First Nation and Métis communities. Appendices 4-A to F provide additional details about the engagement activities.

The Project, if approved, would restrict access for First Nations and Métis communities who currently use the mine site for traditional uses; therefore, the Crown's DTC has been triggered for the Project. Appendix 4-A provides a record of engagement activities undertaken by Shore Gold with First Nations and Métis communities, as well as with non-government organizations, government agencies and the public. Primary concerns expressed during engagement activities related to: potential impacts of the Project on traditional uses of the area; potential impacts to ground water quantity and surface water quality; and reclamation of the pits and kimberlite containment facilities. Detailed comments can be found in Appendix 4-F.

Project-specific concerns raised during engagement and consultation activities were responded to by Shore Gold in the EIS and during the meetings in Appendix 4. Further opportunities for participation in the environmental assessment process will be provided during the review period of the EIA. The Crown is committed to fulfilling its DTC obligations with potentially affected First Nations and Métis communities as described in the province's *Consultation Policy Framework* dated June 2010. Consultation activities would continue as required through the subsequent licensing and permitting phase by the responsible branch/agency, should the Project proceed to that stage.

Biophysical Impacts

Shore Gold has evaluated the possible impacts of the Project on the biophysical environment, the possible mitigation measures that could be employed to eliminate or mitigate (reduce) the impacts and any residual effects that might remain after the mitigation is in place. In undertaking the EIS, Shore Gold identified a number of valued components (VCs) for which detailed information was gathered and analyses conducted to assess the VCs potential to be impacted by the proposed Project. The description of the existing environment is presented in section 5, while the assessment methodology is described in section 6.1 and result of the effects assessment on specific VCs is presented in section 6.2-4. The environmental management system, including monitoring programs, is presented in section 7 and residual effects are identified in section 8.

Terrestrial Environment

Land and Soils

The proposed mine site is located in the FalC island forest surrounded by agricultural lands (see sections 5.2.2 and 6.2.1). The soils are predominantly sandy with high potential for wind erosion and severe limitations for agricultural or commercial forestry capability. Topography is rolling with numerous small tributaries draining south towards the Saskatchewan River. The terrain is generally stable, apart from the banks of the Saskatchewan River, where steep slopes can be susceptible to landslides.

Site clearing and construction would result in loss of soil cover until such time as stockpiled soil can be redistributed during reclamation. Soils stockpiled for future reclamation of building sites, and overburden and PK piles would not be expected to undergo any severe or long-term negative effects that could not be rectified with amendments, such as fertilizer or manure, applied at the time of reclamation.

There would be a permanent disruption to the geology of the area where the Star and Orion South pits, 588.8 and 427.5 ha respectively, would be excavated to depths of up to 350 m. As mining progresses, Star pit would be partially filled with waste rock and then both pits allowed to fill with water, eventually forming two new lakes. The waste rock not placed back into Star pit would be placed in the overburden/rock storage pile, coarse PK pile and PKCF, covering a total of 2701.8 ha of land. Heights of these piles would range from 45 to 60 m creating large areas of significant elevation. Reclamation is intended to return the overburden and rock storage pile to a landscape similar to that of the surrounding terrain but the higher elevation features and lakes would represent very different characteristics as compared to baseline conditions. Shore Gold proposes to manage stability issues with proper back slope grading and erosion control measures. Salvaged reclamation materials would be re-distributed and contoured as part of the ongoing reclamation activities.

Section 6.4.4 provides a visual assessment of the Project from several viewpoints. From an aesthetic perspective, the visual change to the terrain caused by the Project was assessed as having a negligible impact on agricultural or recreational receptors. The impact on the nearby James Smith Cree Nation (JSCN) was assessed as low during construction and negligible following reclamation. However, Spy (Bingo) Hill, identified as a sacred site by a JSCN member, would be totally removed by the excavation of the Star pit. From a cultural perspective, removal of this landmark was rated by Shore Gold as “not significant” to “significant” due to their uncertainty regarding the importance of Spy Hill to the JSCN.

Orion South shales are potentially acid generating, as well as saline and sodic, and Shore Gold has committed to containing them within clay and till layers to prevent impact to soils. Material remaining after diamond extraction in the processing plant may also be acid forming due to having a higher concentration of sulphur. However, based on exploration core sampling, very few kimberlite samples were potentially acid forming. Overall, the kimberlite waste products would be expected to be generally non-acid generating and have little effect on soils in the area.

Vegetation

Descriptions of vegetation are provided in section 5.3.2 and assessment of impacts, mitigation and residual effects can be found in section 6.3.2. Approximately 3936 ha of forest and wetland vegetation would be directly impacted by the mine facilities. Shore Gold proposes to mitigate impacts by: salvaging all merchantable timber; stockpiling topsoil and other suitable reclamation materials including non-merchantable vegetation; revegetating disturbed areas as soon as they are no longer active; revegetating sites so that the vegetation communities post closure are similar to naturally occurring vegetation; and replacing a variety of ecosites to maintain a diversity of vegetation communities.

Indirect effects on vegetation communities from ground water drawdown would persist beyond mine closure. The shallow groundwater drawdown area could influence the FalC forest for several kilometres around the mine site. Jack pine forest may depend on shallow ground water to supplement water from precipitation, especially in times of drought, and reviewers felt that this could cause some upland forest types to experience a slight decline in growth or recruitment or shift to a dryer habitat type. For example, some Jack pine/moss forest sites may change to a Jack pine/lichen type. In rolling areas, the tops of hills may become grass dominated. Impact on the forest would be less in areas with a small amount (e.g., 0.5 m) of drawdown and more in areas of greater drawdown (e.g., 1.0 m). Areas predicted to experience 2 m drawdown would be mostly contained within the mine site where vegetation would already have been impacted by site clearing.

Shore Gold acknowledges that imperfectly drained and moderately well drained soils would likely become drier as a result of drawdown but expects them to recover once mining ceases and the pits fill with water. Shore Gold has committed to begin monitoring water table depth and soil moisture along with vegetation response in both the impacted and undisturbed areas of the FalC forest as soon as mining begins in order to better predict expected long term changes. Monitoring, and mitigation where necessary, is expected to continue for approximately 20 years after closure.

Wildlife and Wildlife Habitat

Descriptions of wildlife and habitat are provided in section 5.3.3 and assessment of impacts, mitigation and residual effects can be found in section 6.3.3. Wildlife would be largely displaced from the actively mined areas and areas occupied by mine facilities. Sensory disturbance from mine activities, including intermittent blasting, would extend beyond the mine site. This disturbance could further compress the range of wildlife that was displaced by the mine site itself, however, the FalC forest has a minimal level of human disturbance and other suitable habitat exists for displaced animals. Shore Gold would minimize the noise through mitigation such as: enclosing the processing plant so that walls and roof provide effective noise absorption; ensuring equipment is maintained in good operating condition; and carrying out noisy construction activities in the daytime. In addition, Shore Gold plans to conduct monitoring at the property line once operations begin to determine if sound levels would be acceptable or if additional mitigation would be required. Shore Gold also expects that many species could become somewhat accustomed to the noise if they are otherwise not threatened.

Species at Risk

Shore Gold addresses species at risk in section 5.3.2 and identified numerous sensitive and at risk wildlife and plant species in the regional study area and six plant species that would be directly affected by clearing. One species, swamp fly honeysuckle (*Lonicera oblongifolia*), was found only at the mine site and would be removed by clearing. Shore Gold has identified that special mitigation, including possible additional surveys and seed collection, would be required for this species. Indirect effects of drawdown on habitats and of sensory disturbances were evaluated as low to moderate by Shore Gold and they have committed to carry out biodiversity monitoring on a regular basis to examine the long term trends.

Technical Review Findings on the Terrestrial Environment

Although some uncertainty remains regarding potential changes to vegetation communities associated with groundwater drawdown and related impacts to other components of the terrestrial environment, reviewers are generally

satisfied with the assessments conducted to characterize Project impacts to the terrestrial environment. In their EIS Shore Gold presents a detailed evaluation of potential impacts, potential mitigation measures and a commitment to carry out monitoring and adaptive management should significant issues arise. Shore Gold would be required to submit a detailed biophysical monitoring and mitigation plan that would address terrestrial vegetation, wildlife and species at risk prior to construction. Monitoring results would need to be submitted to the ministry on a regular basis with management and mitigation adapted as necessary to ensure impacts of the Project would be mitigated to the extent possible.

Water and Aquatic Environment

Groundwater

Shore Gold describes groundwater resources in the Project area in section 5.2.7, assesses impacts of the Project on groundwater in sections 6.2.6 and provides detailed modelling results in Appendix 5.2.7-A. The proposed Project involves the excavation of two pits, Star and Orion South, which would be 300-350 m deep. Shallow and deep (Mannville formation) aquifers would drain into the pits requiring Shore Gold to manage groundwater through pit dewatering to avoid excessive pit wall pressures and water accumulation.

Ditches, sumps and pumps would be used to manage an expected 10,000 m³/day of shallow groundwater flow. Deep wells would be used to depressurize and pump water from the Mannville formation before it enters the pit. Up to 130,800 m³/day of water would be expected to be produced from the Mannville formation. Shallow groundwater would be pumped to the process plant and ultimately to the PKCF whereas, water from the Mannville formation would be blended in a mixing box with process water decanted from the PKCF and either discharged to the Saskatchewan River or reused in processing. Water accumulated in the pit from precipitation and any residual groundwater seepage from pit walls would mostly be pumped to the PKCF unless it is of sufficient quality to supplement flows in the East Ravine (discussed below in the *Surface Water* section). Once the Star pit operations finish, all Mannville formation water and precipitation accumulating in the Orion South pit and process water would be pumped to, and managed, in the Star pit.

The consequence of pit dewatering is drawdown, which is a lowering of the level of water in aquifers surrounding and connected to the pits. The drawdown cone is expected to extend outward from the pits for several kilometers. Groundwater modelling predicted that water levels in both deep and shallow aquifers could be expected to drop by increasingly smaller amounts with distance from the mine site. While a drop in the Mannville aquifer level is not expected to have direct impacts on the environment due to its depth and being non-potable, drawdown is expected to propagate within the overlying shallow groundwater system. A drop in the shallow groundwater system, particularly in

the surficial aquifers, may impact terrestrial and aquatic ecosystems, as discussed in the relevant sections of this document.

Based on data from the Water Security Agency (WSA), Shore Gold has identified 468 wells outside the FaIC forest in a 30 km radius of the Project site. There were no wells identified within 8 km of the site. The groundwater model predicted that the wells greater than 25 m deep would be the most likely to experience possible supply issues related to drawdown. Potential impacts to wells would be identified through the groundwater monitoring program described in section 7.4.2.5. Mitigation could include providing alternative water supplies, new high-lift pumps or above ground storage.

Surface Water

In sections 5.2.6 and 6.2.7, Shore Gold describes surface water in the Project area and assesses the potential impacts that may result from the Project. Up to 100% (68,900 m³/day) of process water would be supplied by the Saskatchewan River water. Up to 150,000 m³/day of water would be released back to the river during peak pit dewatering, thereby avoiding a reduction to the river's flow rate. During times of low flow in the Saskatchewan River, 100% of the process water can be recycled from the PKCF for up to 150 days without requiring additional water.

Predicted water quality for effluent to be discharged to the Saskatchewan River exceeds several guideline parameters. Water originating from the Mannville formation is particularly high in chloride (Appendix 6.2.8-E). However, conclusions drawn from dispersion modelling were that, at 40 m downstream of the discharge point, all provincial and federal guidelines for the protection of aquatic life would be met except for parameters that naturally exceed the guidelines in the baseline condition (Appendix 6.2.7-B). Shore Gold has presented conceptual mitigation for controlling effluent releases, including testing effluent from the PKCF monthly, at a minimum, for all required parameters before release to the Saskatchewan River. During construction, sediment ponds would be used to settle suspended solids prior to release to the environment and monthly samples would be tested for total suspended solids.

Shore Gold conducted baseline studies to examine surface water and sediment quality over several years (section 5.2.8). This information would serve as a reference point for comparing future water and sediment quality measures should the Project proceed. Water quality monitoring would span construction through decommissioning phases of the Project and follow the Metal Mining Effluent Regulations; Saskatchewan Water Quality Guidelines and Water Regulations, 2002; Saskatchewan Surface Water Quality Objectives; CCME Protocols Manual for Water Quality Sampling in Canada; Canadian Environmental Quality Guidelines and any other relevant regulatory requirements.

Aquatic Habitat

As a result of its footprint and the large volumes of waste rock and dewatering water generated by open pit diamond mining, aquatic habitats would be impacted by the Project. Based on earlier review comments, Shore Gold redesigned the Project to avoid or minimize some of the direct impacts of the Project. The overburden and rock storage pile was relocated to avoid fish habitat loss in 101 Ravine, a water management reservoir targeted for Duke Ravine would not be required and the diffuser pipeline would be routed underground to avoid loss of near shore habitat in the Saskatchewan River. Other streams and ravines would experience a reduction in the drainage area contributing to their flow from 100% for East Ravine to negligible amounts for some others. Dewatering would result in indirect impacts to streams and fish habitat with base flow reductions of up to 70%.

Shore Gold discusses the impacts to fisheries and aquatic resources in section 6.3.1 and mitigation for creeks in section 6.2.4 and 6.2.6.1. Proposed mitigation for impacted streams and fish habitat include: reducing water use by recycling process water; supplementing stream flow in several fish-bearing ravines and creeks from the runoff pond; and using appropriate sediment and erosion controls. Fish habitat mitigation and a list of potential compensation projects to offset losses that would be considered during plan approval are presented in the draft Fish Habitat Compensation Plan in Appendix 3.3.1-H. Ministry and Fisheries and Oceans Canada approval of the plan would be required before Shore Gold can obtain the necessary permits to begin construction, should the Project be approved.

Wetlands

Section 6.3.2 provides an assessment of the impacts of the Project on wetland habitats. The amount of wetland habitat that would be directly lost to pit and facility development is estimated at 9 ha while many more wetlands in the predicted drawdown area could be indirectly impacted by a deeper water table. Shore Gold estimated that 10% of the wetlands in the RSA could be impacted by the Project. Similar to terrestrial vegetation types, the drawdown could cause wetlands to become drier, possibly changing the species composition and habitat value.

In section 6.2 Shore Gold commits to monitoring groundwater in all the appropriate geological layers including the surficial sands both inside and outside of the drawdown zone. They have also indicated they would monitor wetland habitats as part of the vegetation monitoring program. Flow supplementation in streams and ravines near the Project site would also help mitigate effects in adjacent wetlands, and replacement of wetland habitat after mine closure would further mitigate some of the effects. An approved detailed water quantity monitoring plan would be required as part of the biophysical

monitoring program prior to beginning construction.

Technical Review Findings on the Aquatic Environment

Regulators reviewing the EIS indicated that, should the Project be approved, a more detailed water quality monitoring plan would be required prior to construction. Additionally, due to uncertainties around the predicted impacts of drawdown on wetlands, aquatic habitats would also be included in the biophysical monitoring and mitigation plan required by the ministry prior to construction. Technical reviewers are otherwise satisfied by the assessment of the Project's potential impacts on water quality and aquatic habitat and the mitigations proposed to prevent or minimize impacts.

Atmospheric and Acoustic Environment

Air Emissions

Airborne emissions would be generated during construction, operation and decommissioning of the Project. The anticipated level and concentration of air emissions from the Project are discussed in section 6.2.2.

Shore Gold undertook dispersion modelling to assess a worst case scenario of the potential impact of the Project on air quality. Air parameters studied included particulate matter, nitrogen dioxide and sulphur dioxide, as the primary indicators of air quality relevant to this Project; and greenhouse gases, largely carbon dioxide, resulting from natural gas and diesel combustion.

Particulate matter sources would include dust from blasting, mining, processing and hauling. Blasting also produces small amounts of sulphur dioxide and nitrogen dioxide. Blasting would be limited to one minute every second day making its contribution to emissions negligible. Total greenhouse gas emissions would amount to about 0.15% of the total provincial emissions and Shore Gold would minimize the impacts of greenhouse gas emissions by implementing initiatives such as energy saving plans, using energy efficient equipment and reforestation of surrounding lands. Other mitigation proposed to minimize air emissions include: ensuring diesel-powered equipment is running efficiently; enforcing speed limits to reduce dust; applying water as a dust suppressant; not idling vehicles; wetting the PKCF when required to avoid wind erosion; and revegetating stripped areas and stockpiles where possible.

Monthly dynamic air quality monitoring would assess suspended particulates and deposition rates at the site boundary in the direction of the prevailing wind and compare to the relevant ambient air quality standards. Static sampling of dust deposition would be carried out monthly near the dynamic sampler, overburden pile and rock storage pile. Monitoring programs would adhere to the Air Monitoring Directive for Saskatchewan and the Canada-wide National Air Pollution Surveillance Network monitoring program.

Results from dispersion modelling indicate all modelled parameters were much lower than the provincial Ambient Air Quality Objectives except for the one-hour nitrogen dioxide average at the Project site fence line. The predicted amount is nearly equivalent to the guideline amount but, as the area is unsuitable for permanent residence, significant impacts would not likely occur. If the Project is approved and monitoring was to show amounts exceeding the guidelines, additional mitigation would be required.

Noise

Noise produced throughout the Project would be similar to any large mining operation and results from blasting, crushing, hauling and waste disposal. Although there are no Saskatchewan or Canadian noise standards applicable to the proposed Project, Shore Gold refers to standards from other jurisdictions including Alberta Energy Resources Conservation Board Directive 038: Noise Control.

Shore Gold measured ambient baseline noise levels which ranged from 22.4 – 46.9 dBA during the day and 22.4 – 32.1 dBA at night (section 5.2). Noise modelling carried out for the effects assessment in the EIS shows elevated noise levels over 60 dBA close to sources such as the pit, overburden pile and processing areas. However, noise levels were predicted to fall to 45 dBA or lower at the fence line, which would fall within the levels recommended by the standards referenced by Shore Gold. If the Project is approved, sound monitoring would be carried out yearly for a 24 hour period to ensure actual sound levels do not exceed predicted values. Although blasting is not accounted for in the modelling or proposed monitoring, it would occur only intermittently and both the noise and vibration would be expected to attenuate substantially over distance. Additionally, blasting would only occur during the day.

Given that there are no human receptors within 1,500 m of the proposed site, no significant impact of noise on humans is expected. Impacts to wildlife would also be expected to be minimal given the attenuation of most sounds with distance from source. Intermittent blasting may initially cause some startle responses near to the site, but research is presented in the EIS indicating that many animals quickly become accustomed to new sounds as long as they are not accompanied by other sensory disturbances. It is unlikely that noise from the Project would cause significant disruption to humans and wildlife in the FaIC forest outside the fence line of the proposed mine site.

Technical Review Findings on the Atmospheric and Acoustic Environment

Technical reviewers are satisfied with the assessment of the Project's potential for impacts due to noise and emissions and with the mitigations proposed to prevent or minimize impacts.

Residual and Cumulative Effects

Section 9 of the EIS presents Shore Gold's analysis of the cumulative impacts of residual effects of the Project. Details regarding residual effects can be found in the relevant portions of section 6 and 8 and are discussed in previous sections of this document.

Cumulative effects of residual impacts may be associated with future activities such as forest harvest, exploration, utilities, access and potential expansion of currently proposed mining. For example, impacts could include: direct habitat disturbance; water quality effects resulting from additional mining effluent; and threats to public safety and wildlife from increased traffic. Mitigation proposed could include increased safety education and road signage and treating waste water if monitoring indicated concentrations of substances above acceptable levels. Actions proposed to minimize cumulative impacts on the land include minimizing land disturbance and reclaiming impacted areas.

Technical Review Findings on Residual and Cumulative Effects

Given the uncertainties associated with predicting cumulative impacts, particularly for activities undertaken by individuals or companies other than Shore Gold, reviewers are satisfied with the assessment of cumulative effects presented in the EIS.

Effects of the Environment

Shore Gold considered how the environment could potentially adversely affect the proposed Project in section 6.5. The environmental events that were considered under this section were forest fires, terrain stability, floods, weather and climate extremes, and climate change. The assessment results presented indicate the Project as proposed is not likely to be adversely affected by natural disaster or predicted changes to climatic conditions in the Project area.

Impacts from potential flooding of the Saskatchewan River were examined and Shore Gold concluded that, due to the elevation of the site relative to the river banks, a 1:250 year flood event would not flood the Star pit. In the event of soil erosion or minor landslides during a flood event, remedial actions such as armouring with rock or geotextile could be undertaken to stabilize the land bridge and protect it from future flood events. In addition, at the end of mining the south end of the Star pit would be reinforced with backfilled overburden to further stabilize the site.

Climate change impacts are difficult to predict. A warmer, cooler, wetter or drier climate could influence the forest response to water table drawdown in a number of different directions and so is beyond the ability of Shore Gold to predict. Similarly, forest fire frequency or severity could be influenced by a

combination of drawdown and/or climate change but is very difficult to predict. The physical and biophysical monitoring that would be required of Shore Gold, should the Project be approved, would detect changes that may be influenced by climate change.

Technical Review Findings on the Effect of the Environment on the Project

Technical reviewers are satisfied by the assessment of the potential for the environment to impact the Project and the mitigations proposed to prevent or minimize impacts.

Heritage and Socio-Economic Considerations

Heritage Resources

Shore Gold's assessment of possible impacts to heritage resources is presented in section 6.4.6. In response to initial baseline studies in which 108 heritage resource sites were identified, Shore Gold developed a Heritage Resources Impact Mitigation Strategy. With guidance from the Heritage Conservation Branch of the Ministry of Parks, Culture and Sport, sites were ranked to determine which required further examination. Lowest ranked sites were mitigated through excavation, collection, mapping and assessment of the resource with results being submitted to the Heritage Conservation Branch. A more intensive mitigation program, the results of which can be found in Appendix 6.4.6-A, was applied to high and moderate ranked sites and a final report was provided to the Heritage Conservation Branch. Clearance letters under section 63 of The Heritage Property Act were then provided to Shore Gold for the Project.

Due to changes in the Project footprint following the initial assessment, impacts would be avoided to 28 known sites, but 11 new sites would require further assessment and clearance under The Heritage Property Act prior to construction of the Project, should it be approved.

Cultural Considerations

Archeological evidence supports the fact that, traditionally, the FalC forest and surrounding area was used by aboriginal people for social interaction, religious ceremonies and as a source of plants and animals. The Project is not expected to significantly impact the ability of First Nations and Métis people to hunt, fish and trap for food or carry out traditional land use activities in the FalC forest except for at the mine site itself. However, excavation of the Star pit would result in the removal of Spy Hill, identified as a sacred site in the traditional land use (TLU) study for JSCN. Details of land use are provided in section 5.4 and 6.4. Shore Gold has proposed mitigation for impacts to Spy Hill in section 6.4.2, with their preferred option being implementation of socio-cultural benefits, such as supporting programs that would facilitate preservation and

transfer of traditional knowledge.

Technical Review Findings on Cultural Considerations

Technical reviewers agreed with Shore Gold's conclusion that additional discussions with impacted First Nations and Métis communities may be required to further examine and address the cultural impacts of the Project.

Socio-Economic Considerations

Section 6.4.1 assessed the socio-economic impacts expected as a result of the Project. The proposed mine would create both positive and negative impacts on the social and economic fabric of the area. Shore Gold would spend nearly two billion dollars on construction and operation of the mine and employ about 700 staff for over 20 years. The jobs and services required to support the Project would bring economic opportunities to the area. Conversely, the skilled labour pool may be strained trying to fill the demand for workers. As mitigation, Shore Gold has committed to working with local training institutions and communities to develop a workforce representative of the geographic area surrounding the Project. This includes continued participation as a board member of the Northern Career Quest, Aboriginal Skills and Employment Program and as a member of the FalC Employment Partnership.

Local infrastructure such as roads, schools and housing may be over-extended by the influx of people and resource demands for the Project. To alleviate stress on local infrastructure, Shore Gold intends to build a construction phase work-camp, stagger shift changes, work with Ministry of Highways and Infrastructure to ensure safe access, use rail to transport large loads and assist in upgrading the local rail station, and work with the RCMP and local emergency response officials to plan for and address any safety issues that may arise.

The province would benefit from the Project indirectly through the communities and directly through income taxes paid by staff, professional services employed, utility payments and the construction industry. Direct benefits would come in the form of corporate and production taxes and royalties. Shore Gold provides an analysis of estimated direct and indirect financial benefits to the province in section 6.4.1.7.

Technical Review Findings on Socio-Economic Considerations

Technical reviewers were satisfied that Shore Gold adequately examined and addressed the socio-economic impacts of the Project.

Decommissioning, Reclamation and Abandonment Plan

Section 7.5 of the EIS includes a conceptual decommissioning and reclamation plan for the Project site. Reclamation would be progressive as mining activities cease in a given area. Star pit would be partially backfilled with some overburden and the entire fine PK and process water from Orion South pit. Ultimately the PKCF, overburden and coarse PK piles would be decommissioned by capping and revegetating. Part of the Star pit and the entire Orion South pit would be left to infill with groundwater and precipitation to become lakes. Active filling from the Saskatchewan River could be considered to speed up the infilling. This would likely also increase the rate at which aquifers could recharge. Shore Gold has committed to assess the potential to actively fill the pits during the detailed design phase or evaluate the option during operations and make a decision in conjunction with regulators.

Shore Gold intends to revegetate all disturbed areas as soon as they become inactive with the aim of creating a suite of vegetation communities similar to those in the surrounding FalC forest. A detailed plan for decommissioning, reclamation and abandonment as well as the determination of appropriate financial assurance would be developed in consultation with provincial regulatory bodies through their respective licensing and permitting processes should the proposed Project receive Ministerial Approval under the Act.

Technical Review Findings on Decommissioning, Reclamation and Abandonment Plan

Although technical reviewers were generally satisfied with Shore Gold's conceptual program for decommissioning and reclamation, they emphasized that much greater detail would be required regarding reclamation activities to be undertaken, particularly with regards to the large amounts of non-merchantable plant (organic) material would be cleared and buried rather than stockpiled for future reclamation work. Organic materials, soil and other substrates necessary for capping the PKCF and waste rock piles to make them suitable for revegetation may be in very short supply in the area. If the Project is approved, the ministry would require a detailed, comprehensive decommissioning and reclamation plan and financial assurance prior to the beginning of construction. This detailed plan would be reviewed every five years during operations and refined to ensure appropriate considerations have been integrated into decommissioning and reclamation activities.

4. Conclusion

Members of the Saskatchewan Environmental Assessment Review Panel (technical reviewers) and the ministry conclude that Shore Gold has undertaken sufficient studies and provided adequate information about the proposed Project such that the EIS can be made available for public review.

Invitation to Comment

The public is invited to review Shore Gold's EIS and the TRCs and provide their comments no later than **Wednesday, March 18, 2015**.

Public is invited to comment on the Project EIS for a 60 day period ending March 18, 2015.

The EIS and Final TRCs are being made available for review at the administrative offices of: RM of Torch River, RM of Nipawin; RM of Kinistino; City of Prince Albert; the Legislative Library in Regina; and at Saskatchewan.ca/environmentalassessment.

Written comments received during the public review of the EIS and TRCs will be considered by the Minister of Environment when he makes his decision under section 15(1) of The Environmental Assessment Act to either:

- (a) give ministerial approval to proceed with the development and impose any terms and conditions that he considers necessary or advisable; or
- (b) refuse to approve the development.

Contact

For more information, please contact:

Ann Riemer
Senior Environmental Assessment Administrator
Phone: 306-787-5793

or

Brianne England
Senior Environmental Assessment Administrator
Phone: 306-787-6190

Environmental Assessment Branch
Saskatchewan Ministry of Environment
3211 Albert Street
Regina SK S4S 5W6
Fax: 306-787-0930
Email: environmental.assessment@gov.sk.ca