

EXECUTIVE SUMMARY

Introduction

The purpose of the Expansion Project Environmental Impact Assessment (EIA) is to evaluate and report the environmental and socio-economic effects of the proposed development by itself, and in conjunction with other existing, approved and publicly disclosed projects in the region. The project is located 150 km south of Fort McMurray and 10 km southeast of Conklin. The EIA has been prepared in accordance with the requirements prescribed under the Alberta *Environmental Protection and Enhancement Act* (EPEA) and the Final Terms of Reference (TOR) for the project. The EIA forms part of KNOC's joint application to the Alberta Energy Resources Conservation Board (ERCB) and Alberta Environment (AENV).

Scope of the EIA

The EIA will assist regulatory authorities and the public in understanding and evaluating the potential impacts and benefits of the project during construction, operation and reclamation. The impact assessment process identified and examined potential biophysical, historic resource, and socio-economic impacts that may occur as a result of the proposed project. This process examined the ways environmental and socio-economic conditions may change and, if necessary, identified mitigative measures to reduce or eliminate potential adverse effects.

Project Assessment Scenarios

The project is assessed on the basis of three scenarios (baseline, application and planned development), as applied to local and regional study areas, which vary from component to component:

- the baseline case considers existing and approved projects in the study area;
- the application case considers the project as an addition to the baseline scenario; and
- the planned development case considers the environmental conditions that would exist as a result of the interaction of the proposed project, existing and approved projects and other planned projects that can be reasonably expected to occur.

Study Methods

Impact assessments are based on measured, estimated, or reasonably expected changes in some attributes of a selected receptor. These 'key indicator resources' (KIRs) or 'valued ecosystem components' (VECs) are considered to be representatives of the larger environment, with the assumption that if little to no impact to the receptor is identified, the broader environment will not be impacted. The identification of KIRs and VECs is dependent on: scientific understanding of the ecological components and their interactions in the overall environment within which the project will be developed, the issues identified during the course of the impact assessment, and the terms of reference for the project.

Quantitative methods of assessment were used wherever possible. Predictive modelling was used as a tool in several areas including air, noise, hydrogeology, hydrology and surface water quality sections. Predicted results were compared to observed data from the study area. Risk assessment techniques were used for human health assessments. Discipline-specific assessment techniques are described in each section.

For each identified receptor, an assessment of the potential impact is made using the attributes of direction, geographic extent, magnitude, duration, reversibility and confidence in the relationship between the cause and effect. An overall impact assessment rating for each receptor is derived based upon the individual attributes.

Cumulative Effects Assessment

Cumulative effects are impacts that result from the interaction of several projects or activities within a region. These impacts may occur as a result of simultaneous activities within the same geographic boundaries and/or activities that occur over time. Although the impacts associated with each individual activity may be acceptable, the combined effects may be deemed unacceptable.

Summary of Project Impacts and Effects

Three tables have been prepared to summarize project impacts and effects, based on the study methods described above. Potential moderate impacts of the project have been identified for several environmental attributes including hydrology, soils, vegetation, wildlife and land use ([Table 1](#)). Potential low impacts of the project may occur in air, noise, hydrogeology, water quality, soils, aquatic resources, wildlife, traditional resource use and socio-economics ([Table 2](#)). Potential cumulative effects have been identified for hydrology, soils, vegetation, wildlife and socio-economics ([Table 3](#)).

Comprehensive details and summaries for all EIA components and project impacts and effects are found within [Volumes 2 and 4](#).

Table 1: Summary of Moderate or High Project Impacts

Impact Category	Direction of Impact	Geographic Extent of Impact	Magnitude of Impact	Duration of Impact	Reversibility	Confidence	Final Impact Rating
Hydrology							
Mean Annual Flow	Negative	Local	Low to Moderate	Long-term	Yes	High	Medium
1:10 Year Flood Event	Negative	Local	Low to Moderate	Long-term	Yes	High	Medium
1:100 Year Flood Event	Negative	Local	Low to Moderate	Long-term	Yes	High	Medium
Low Flow	Negative	Local	Low to Moderate	Long-term	Yes	High	Medium
Soils and Terrain							
Land Capability for Forestry	Positive	Local	Moderate	Long-term	Yes	Good	Moderate
Soils Suitable for Reclamation	Neutral/Positive	Local	Moderate	Long-term	Yes	Good	Moderate
Vegetation							
Ecosite Phases of Restricted Distribution	Negative	Local	Moderate	Long-term	Yes	High	Moderate
Rare Plants	Negative	Local	Moderate	Long-term	Yes	Moderate	Moderate
Berry Production	Negative	Local	Moderate	Mid-term	Yes	Moderate	Moderate
Wetlands and Peatlands	Negative	Local	Moderate	Long-term	Yes	High	Moderate
Wildlife							
Caribou	Negative	Local/Regional	Moderate	Long-term	No	Moderate	Moderate
Resource and Land Use							
Trapping and Traditional Use Plant Species	Negative	Local	Moderate	Long-term	Yes	High	Moderate

Table 2: Summary of Selected Low Project Impacts

Low Residual Impacts		
Air	PM _{2.5}	Impacts of ground-level air quality are dominated by the emissions from existing operations in the area.
	Ozone	The incremental change due to NO _x emissions from the project are low, therefore the incremental formation of ozone due to the project is low.
	GHGs	The proposed project greenhouse gas emissions represent 0.29% and 0.10% of the Alberta and national totals, respectively.
Noise	Project Operation	The predicted comprehensive sound levels are below the permissible sound levels during the daytime and nighttime periods within a 1.5 km buffer around the project. There are no receptor sites within this buffer zone.
Hydrogeology	Groundwater Withdrawal	The withdrawal is predicted to be low, extending beyond the LSA. Once pumping stops, groundwater levels should recover due to natural recharge.
	Production and Steaming	Low magnitude changes in water quality are predicted. Once steaming stops, the temperature and mineral concentrations are predicted to return to baseline conditions.
Soils and Terrain	Admixing	The project will not result in adverse effects on soil and terrain resources given the application of the mitigation measures and reclamation plans.
	Compaction	
	Water Erosion	
	Wind Erosion	
	Contamination	
	Soil Acidification	
Aquatic Resources	Fish and Fish Habitat	Three new instream crossings will be constructed and watercourses will be protected by a 100 m setback.
Wildlife	Indicator Species	Impacts to Canadian toad, mixedwood forest birds, old growth forest birds, great grey owls, moose, Canada lynx, black bear fisher and northern long-eared bat will be low.
Traditional Resource Use and Traditional Ecological Knowledge	Berry Picking Areas	Traditional sites will be avoided as much as practical. Where sites cannot be avoided, consultation with local peoples will occur to reduce project impacts.
Socio-Economic	Employment, Population, and Provincial Economics	The project is relatively small compared to the size of the overall Alberta economy.

Table 3: Summary of Selected Low Cumulative Effects

Low Residual Impacts		
Hydrology	Mean Annual Flow, 1:10 and 1:00 Year Flood and Low Flow	Withdrawals from existing surface water will not be used for steam generation, extraction, injection or processing and mitigative measures will reduce impacts from construction and runoff.
Soils and Terrain	Soils and Terrain Indicators	The project will not result in regional cumulative effects on soil and terrain resources given the application of the mitigation measures and reclamation plans.
Vegetation	Rare Ecosite Phases	Cumulative effects of ecosite phases with restricted distribution will be low.
	Rare Plants	Rare plants will be affected by clearing, drainage alteration, dust, and reclamation.
	Wetlands and Peatlands	Cumulative effects on wetlands and peatlands are expected to be low.
Wildlife	Habitat Loss, Linear Density and Fragmentation	Cumulative loss of habitat is predicted to be 9.5%, of which the project contribution is <0.1%.
Socio-Economics	Socio-Economic Indicators	The regional contribution of the project will be low since it is a small project relative to the magnitude of the other oil sands projects planned for the region.