PROPOSED TERMS OF REFERENCE
ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR EASTERN IRRIGATION DISTRICT'S PROPOSED SNAKE LAKE RESERVOIR EXPANSION PROJECT

Approximately 22 km southeast of Bassano and 22 km northwest of Brooks, Alberta

ISSUED BY: **Eastern Irrigation District**

DATE: **October 20, 2023**

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PURPOSE OF THE TERMS OF REFERENCE

This document identifies for Eastern Irrigation District (EID), Indigenous communities, and appropriate stakeholders, information required by government agencies for an Environmental Impact Assessment (EIA) report prepared under the *Environmental Protection and Enhancement Act* (EPEA) for the Snake Lake Reservoir Expansion Project (the Project).

The existing Snake Lake Reservoir is located within Townships 19 and 20, Ranges 16 and 17, W4M, approximately 15 km southeast of Bassano and 32 km northwest of Brooks, Alberta. The reservoir is contained by two earth-fill dams: the first along the east end (East Dam) located in Section 31-19-16 W4M, and the second along the west end (West Dam) located in Section 3-20-17 W4M. The reservoir is an off-stream irrigation storage facility originally constructed from 1995 to 1997 and is owned and operated by the EID.

The existing reservoir covers 320 ha and has a storage volume of 14,900 acre-feet (ac-ft) (18.4 million m^3) at full supply level (FSL) with a geodetic elevation of 781.70 metres above sea level (masl). Water sourced from the Bow River at Bassano Dam is diverted into the reservoir from EID's East Branch Canal via a gated inlet chute combined with an online check structure. Outflow from the reservoir is through the East Dam Low Level Outlet, located near the north end of the East Dam. This water helps support 50,000 acres (20,000 ha) of downstream irrigated agriculture.

The Project will expand the reservoir by constructing a 9 km long earthen berm in Sections 29, 30, 31, and 32 in Township 19, Range 16, W4M, extending the reservoir approximately 3 km to the south and 3 km to the east. The Project will increase the reservoir area by 780 ha to a total area of 1,100 ha. The volume of stored water will increase to 70,000 ac-ft (86 million m^3). The dam and reservoir will be permanent features.

The Project will not require an increase to the EID's water allocation or maximum diversion rate. Water will be transferred into the reservoir when flows are abundant in the Bow River and will store a full year's supply of water for downstream users. During extended droughts and periods of low flow, the reservoir will supply agricultural and other downstream water needs, such that additional water withdrawals from the Bow River will not be required. This will allow more water to remain in the Bow River, helping to maintain instream flow needs.

SCOPE OF THE EIA REPORT

EID (the Proponent) shall prepare and submit an EIA report that examines the environmental and socio-cultural effects of the Project and will address applicable provincial and federal legislation, codes of practice, guidelines, standards, policies, and directives. The EIA report shall be prepared in accordance with these Terms of Reference and the environmental information requirements prescribed under EPEA and the *Impact Assessment Act*, if applicable. The EIA report will form part of the Proponent's application to the Natural Resources Conservation Board (NRCB). An EIA report summary will be included as part of the NRCB Application.

EID shall refer to the *Guide to Preparing Environmental Impact Assessment Reports in Alberta* published by Environment and Protected Areas (the Guide) and these Terms of Reference when preparing the EIA report. Where there is a difference in requirements between the Guide and the Terms of Reference, the Terms of Reference shall take precedence.

CONTENT OF THE EIA REPORT

1 PUBLIC AND INDIGENOUS ENGAGEMENT

[A] Document the Project's public engagement program including:

a) a list of all in-person meetings and virtual meetings including dates, attendees, project information discussed, and the specific comments or issues raised;
b) a list of other engagement methods including communication via websites, radio, television, and newspapers, and the potential audience reached;
c) description and documentation of concerns and issues expressed by the public, analysis of those concerns and issues, and actions taken to address those concerns and issues; and
d) a description of how public input was incorporated into Project development, impact mitigation, and planned monitoring.

[B] Document the Project's Indigenous engagement program including:

a) a list of in-person and virtual meetings including dates, attendees, project information discussed, and the specific comments or issues raised;
b) a description and documentation of concerns and issues expressed by Indigenous communities and groups, the Proponent's analysis of those concerns and issues, and the actions taken to address those concerns and issues;
c) a description of how Indigenous input was incorporated into Project development, impact mitigation, and planned monitoring; and
d) any studies of traditional ecological knowledge and traditional use of land and water undertaken with Indigenous communities.

[C] Describe plans to maintain the public and Indigenous engagement process following completion of the EIA report to ensure that the public and Indigenous peoples will have an appropriate forum for expressing their views on the development and operations of the Project.

2 PROJECT DESCRIPTION

2.1 Overview

[A] Identify the legal entity that is the proponent for the Project, the legal entities that will develop, design, and construct the Project, and the legal entity that will manage and operate the completed Project and hold the operating approvals.

[B] Identify the activity under the activities designation regulation of EPEA that is applicable for this project and discuss why the activity requires an EIA report.

[C] Outline the purpose and rationale for the Project, explaining the need to improve irrigation water management to meet future demands. Identify opportunities for improvement in water management and sustainability based on potential changes in water supply and future demands. Discuss how the purpose and rationale are related to broader public sector policies, plans, and programs, such as the Provincial Irrigation Strategy and climate change policies and objectives. Discuss how the Project will:

a) improve the operational efficiency of the EID including supporting existing irrigators and other water users during droughts;
b) address rural and regional economic development objectives;
c) help maintain instream flow needs in the Bow River; and
d) provide enhanced recreational opportunities.

[D] Provide an estimate of future trends in water demand downstream of the reservoir and discuss the water sourcing for the reservoir as per the proponent's Water Licence and the average and range of water output levels expected in normal, wet, or drought years.

[E] Discuss the roles of various government departments, agencies, and non-governmental organizations in the approval or oversight of the project. List all regulatory approvals received or required including those under federal, provincial, or municipal jurisdictions.

[F] Describe the environmental and cultural setting of the Project, including climate, topography, key physical, chemical, or biological characteristics of the regional airshed, surface waterbodies, geology and soils, natural ecosystems and habitats and their associated species, and current and historical human occupation and land uses. Focus this description on any unique or important local and regional features that may affect or interact with the Project's development.

[D] Provide a regional map showing the project location in relation to nearby towns, cities, First Nation Reserves, other relevant jurisdictions, protected areas, named watercourses and waterbodies, and other regional features that may interact with the Project.

[E] Describe key project activities during construction and operations stages. Describe how mitigation measures and/or offsets will reduce environmental and socio-cultural effects.

[F] Describe and provide maps and/or survey drawings of all components of the Project, including the proposed dam structure, water supply, water conveyance structures, reservoir surface, borrow pits, access roads, and any other associated works, showing adjacent land uses and important environmental features in the local area.

a) describe the activities to facilitate site clearing, excavation, and dam/berm construction.
b) identify worker training and safety measures to protect workers and the environment during construction and operations.
c) list and describe all temporary facilities and infrastructure, access, and utilities required for construction. Identify if any provincial or municipal roads or infrastructure will need upgrading.
d) describe the equipment, personnel needs, and approximate effort to construct the Project.
e) describe the plan to accommodate workers and travel to site, and methods of transporting materials and equipment to site.
f) provide a generalized schedule for project phasing, including site preparations, construction, reservoir filling, reclamation of berms and temporary features, and start of operations.
g) list the equipment, personnel, effort, and facilities during operations. Describe how water at the site will be managed.
h) describe the water levels, inputs, and outputs of the reservoir for a typical year, including controls to manage operations for different climatic conditions, upstream water availability, and downstream demands.
i) describe maintenance activities during project operations to maintain functioning of the dam and reservoir, including methods to assess when major maintenance activities or repairs are required.
j) describe alternatives to the Project considered for addressing downstream irrigation needs, including technical design options and concepts to demonstrate the best available technologies. Examine other reservoir options, reservoir sizes and capacities, and other methods to provide similar off-stream water storage. Discuss feasibility of implementation and likelihood of success for these options.

k) discuss the implications of a delay in proceeding with the Project, or any phase of the Project, and the implications of not proceeding with the Project.
l) discuss the potential for future expansion or modification of the dam and reservoir.

[G] Describe the normal operating characteristics of the proposed reservoir, including:
a) operating depth and volume ranges; and
b) flooded surface area at maximum reservoir level.

[H] Identify sources of construction materials, including use of in-situ aggregate materials, offsite borrow pits, or purchased materials. Describe excavation methods and temporary stockpiling plans. Provide information on studies of the suitability of in-situ materials for dam construction.

[I] Describe the construction activities for the proposed dam and appurtenant structures, including:
a) site clearing and grubbing;
b) topsoil stripping;
c) construction and use of temporary works or structures (e.g., temporary roads, runoff controls, construction camps, and laydown areas);
d) excavations, slope stabilization, and foundation preparations;
e) construction of the dam and its appurtenant structures;
f) management and authorization of design changes during construction;
g) methods to ensure quality assurance and quality control (QAQC) during construction;
h) installation of impervious linings and erosion protection measures, if required;
i) installation of instrumentation, mechanical, and electrical equipment, if required;
j) upgrading existing access roads, if required;
k) testing and commissioning the facility; and
l) removal and reclamation of temporary construction facilities.

[J] Discuss preparations and filling of the expanded reservoir, including:
a) management of water levels in the existing reservoir;
b) the planned approach to ensure successful first filling;
c) planning for how and when the existing East Dam will be breached;
d) estimated time for the new reservoir to be filled, and the expected water elevation, surface area and distribution of water, and volumes of water during the filling process;
e) management efforts to ensure dam safety during this activity, including development of a safety management plan and an emergency management plan, including an assessment of effects on downstream infrastructure if the new dam were breached while filling; and
f) methods for managing fish, wildlife, debris, and shoreline stability during reservoir filling.

[K] Describe the decommissioning of temporary construction facilities, and any associated reclamation.

2.2 EIA Summary

[A] Provide a summary of the EIA including:
a) economic, environmental, and social effects (positive or negative) of the Project during construction and operation stages on:
   i. agriculture,
   ii. non-agricultural land uses, municipalities, and industries,

iii. employment and business opportunities,
iv. the local and regional environment,
v. cultural and recreational opportunities for the public, Indigenous communities, and local or regional stakeholders, and
vi. environmental (land, water, air) and historical resources.

b) Proposed mitigations or offsets to manage or reduce negative effects or enhance positive effects.
c) Proposed monitoring programs to verify the conclusions of the environmental assessment and measure the effectiveness of proposed mitigation plans. Discuss:
   i. the Proponent's plans for addressing and mitigating any environmental impacts identified in the monitoring program;
   ii. how monitoring information could be used to effect changes in construction, filling, or operations;
   iii. how monitoring data will be disseminated to the public and other interested parties; and
   iv. how the results of monitoring programs will be integrated within an environmental management system.

[B] Provide a summary of the Cumulative Effects Assessment.

2.3 Constraints

[A] Discuss the process and criteria used to identify constraints to development, and how the Project was designed to meet the objectives and goals of:

a) the South Saskatchewan Regional Plan under the provincial Land-Use Framework;
b) the apportionment agreement with Saskatchewan and how apportionment commitments are met;
c) Provincial Irrigation Strategy;
d) applicable municipal and intermunicipal plans; and
e) the Government of Alberta Rural Development Initiative and Rural Development Strategy.

[B] Describe the process and criteria used to select sites for project components, including:

a) the dam;
b) water conveyance structures;
c) borrow sites; and
d) temporary facility and storage sites.

[C] Identify and describe potentially affected infrastructure including:

a) railways;
b) provincial highways;
c) roads, pipelines, well sites, power lines or other infrastructure;
d) any communications with the owners of infrastructure regarding potential impacts and relocation requirements, and any other measures required to mitigate permanent or short-term impacts; and
e) any proposed protection, relocation, or reconstruction of infrastructure, and measures to mitigate impacts during construction.

[D] Identify constraints related to onsite biophysical features, socioeconomic conditions, and cultural activities in the local and regional areas, including:

a) important species and their habitats, ecological communities, landscape features, open water and wetland features, or environmentally sensitive features;
b) Indigenous traditional use sites;
c) cultural use and recreational use sites;
d) monitoring sites; and
e) protected sites.

[E] Describe any public lands or public land uses that may conflict with the Project.

2.4 Regional and Cooperative Initiatives

[A] Discuss the Proponent's involvement in regional and cooperative efforts to address environmental and socio-economic issues associated with regional development, including environmental stewardship and habitat improvement programs or initiatives, participation in regional organizations or forums, or multi-party research programs.

[B] Describe opportunities for sharing infrastructure (e.g., access roads, utility corridors, water infrastructure) with other resource development stakeholders or the local municipality.

[C] Discuss potential cooperation with other parties regarding water related infrastructure and management including water intakes, pipelines, water storage and withdrawals, flow monitoring and reporting, and ecological monitoring of waterbodies.

[D] Discuss existing regional monitoring programs including the history, objectives, methods, and highlights of past observations of the Proponent's existing monitoring activities that will assist in managing environmental effects, confirm performance of mitigation measures, and improve environmental protection strategies for the Project. Discuss:
a) monitoring performed in conjunction with other stakeholders or done independently by the Proponent;
b) whether these programs are consistent with other current or proposed regional monitoring programs; and
c) how these programs help address monitoring needs for the various disciplines in the EIA report.

[E] Provide a fire control plan for grassland areas surrounding the Project, highlighting:
a) coordination of fire control with municipal governments or provincial departments;
b) fire prevention, detection, reporting, and suppression measures – including proposed fire equipment and onsite infrastructure; and
c) measures to ensure continued municipal fire service access to adjacent areas.

2.5 Dam Safety

[A] Describe how the Project will adhere to the Alberta Dam and Canal Safety Directive and include:
a) project component designs and technical specifications;
b) data collection methods, models, and studies used to support the design;
c) assumptions used in developing designs and technical specifications;
d) planned duration of construction, reservoir filling, and operations;
e) the uncertainty, reliability, and sensitivity of models and analytical techniques used in the design process; and
f) any gaps in knowledge on the designs and technical specifications, including steps to address these gaps.

[B] Determine the Consequence Classification of the proposed dam as per Schedule 1 of the Alberta Dam and Canal Safety Directive.

[C] Describe the following for the dam, reservoir, and/or appurtenant structures:

a) principal dimensions;
b) anticipated quantities of construction materials;
c) seepage controls and drainage provisions;
d) use of stability analysis and factors of safety in the designs;
e) freeboard requirements;
f) flood infrastructure and controls;
g) the characteristics and geotechnical properties of naturally available surface and subsurface materials for construction;
h) field and lab testing to determine material suitability for construction;
i) potential challenges or issues that could impact design and safety during construction and operation stages, and potential mitigation measures;
j) any assessments completed of alternative design concepts, technical options, and structure locations to demonstrate the selection of best available technology; and
k) the expected performance of the structures under usual and unusual loading conditions, including required mitigation measures for unusual conditions.

[D] Identify potential accidents and malfunctions (e.g., cofferdam leakage or failure, sediment control failure, or any other Dam Safety incidents) for all stages of the Project. Complete a risk management plan as per the Alberta Dam and Canal Safety Directive. Include, if warranted, an assessment of cascade failure of downstream irrigation canals and dams.

[E] Identify if any blasting will be required; if so, list the frequency and methods, types of explosives, and safe storage and use of explosives.

[F] Describe challenges that could affect safety of the proposed structures, and measures to minimize the risk of accidents and malfunctions during excavation, reservoir filling, dam operations, and maintenance activities.

[G] Describe planned mitigation measures and management practices to address accidents or malfunctions, water and debris management, emergency preparedness, and response plans.

[H] Describe the expected performance of the proposed dam and appurtenant structures during and after extreme events (e.g., floods, windstorms, earthquakes, etc.); including information on how earth dams, diversions, and flow control structures have been designed to withstand those events, as well as potential challenges and mitigation measures.

[I] Provide details of dam, reservoir, canal and other infrastructure performance monitoring during construction, reservoir filling, and project operations, to ensure potential failures are identified and addressed proactively and to ensure the Project will meet environmental and performance objectives.

[J] Describe the operations phase safety concerns and planning, including:

a) operation and maintenance activities needed for the safe operation of the dams, and to prolong their operational capacity;
b) management of reservoir fluctuations and shoreline protections;
c) the water management approach for flood, normal, and drought conditions, including reservoir operations, and resulting downstream flows and water levels;

d) testing and monitoring for dam structural integrity throughout operations, including testing for water seepage through the dam into subsurface aquifers or surface waterbodies and monitoring for surface erosion and subsurface movements or weak spots; and
e) operation and maintenance plans to ensure continued integrity and normal function of the dam and reservoir.

2.6 Water Management

2.6.1 Water Supply

[A] Describe the water supply requirements for the Project, including:

a) the source of water for the reservoir, water demands on the Bow River, and how this will be licenced;
b) project effects on flows within the Bow River downstream of the project area and whether this may affect apportion requirements;
c) the expected water balance during all stages of the Project including water input, water storage, and water outflow to the canal system and water gains or losses from precipitation, run-on, evaporation, and seepage;
d) discuss assumptions made or methods chosen to arrive at the water balances;
e) variability in water requirements among seasons and years, considering the range of climate (normal, wet, and drought years), and expected downstream demands; and
f) expected cumulative effects of Project and other water users on the Bow River downstream from the source location during Project operations.

2.6.2 Surface Water Management

[A] Describe the surface water management strategy for the reservoir surface prior to filling, during filling, and during normal and abnormal operating conditions, including:

a) design factors to manage, such as:
    i. site drainage,
    ii. run-on and runoff management,
    iii. erosion and sediment controls,
    iv. geotechnical stability concerns,
    v. surface water quality issues,
    vi. groundwater interactions,
    vii. wetland and waterbody drawdown or increases in water level, and
    viii. groundwater seepage;
b) permanent or temporary alterations or realignments of drainages, watercourses, wetlands, and other waterbodies during construction; and
c) the pre- and post-disturbance alignment and condition of drainages, watercourses, wetlands, and other waterbodies, including those created by the Project.

[B] Describe and map all roadway, pipeline, powerline, and any other crossings of drainages, watercourses, or waterbodies pre- and post-construction.

[C] Describe how requirements of the Alberta Wetland Policy and *Water Act* will be met, including how:

a) avoidance, minimization, reclamation, or replacement of wetlands will occur in accordance with the Alberta Wetland Mitigation Directive; and
b) temporary and permanent alterations (direct and indirect) to wetlands will be approved.

[D] Evaluate the agricultural water needs downstream of the project in normal and severe drought years and compare to the current reservoir volume and planned expansion reservoir volume.

[E] Discuss effects of the Project on maintenance of Bow River instream flow needs in normal and drought conditions.

[F] Discuss effects on surface water users from the Project. Identify any potential water use conflicts.

2.6.3 Wastewater Management

[A] List expected sources and amounts of wastewater generated onsite, including (as applicable) wastewater from construction camp facilities, portable toilets, personal washing/hygiene facilities, and industrial sources of wastewater, including accidentally contaminated surface waters, onsite precipitation, run-on, and runoff.

[B] Describe the wastewater management strategy during construction, including:

a) how wastewater will be collected, treated, stored, and disposed; and
b) whether temporary facilities will be brought to site or constructed on site to handle wastewater.

2.7 Waste and Hazardous Materials Management

[A] Characterize and quantify the anticipated dangerous goods, hazardous, non-hazardous, and recyclable wastes generated by the Project during construction, and describe:

a) the composition and volume of specific waste streams;
b) how each stream will be collected, sorted, and stored prior to disposal;
c) plans for pollution prevention, waste minimization, recycling, and management to reduce waste quantities for all stages of the Project;
d) planned methods for waste disposal during construction, including onsite or offsite disposal options; and
e) for onsite disposal, provide information supporting disposal site suitability considering water quality protection, geotechnical considerations, and environmental considerations including health of wildlife, vegetation, and human land uses.

[B] Describe the nature and amount of on-site hydrocarbon storage, such as fuel, lubricants, hydraulic fluids, or other chemicals. Discuss containment and other environmental protection measures used at storage sites.

2.8 Conservation and Reclamation

[A] Provide a conceptual conservation and reclamation plan, including reclamation and revegetation of the dam's backslopes and of temporary facility or infrastructure sites.

3 ENVIRONMENTAL ASSESSMENT

[A] For each discipline section, complete a baseline evaluation, environmental impact assessment, and where warranted, a cumulative effects assessment as per the *Guide to Preparing Environmental Impact Assessments in Alberta*.

[B] Summarize information from field studies and existing sources to develop a Baseline Case addressing conditions in and near the project site (Local Study Area; LSA) where direct and indirect project effects may occur on identified resources or indicators. When applicable and

needed for a cumulative effects assessment, addressing conditions for a larger regional area (Regional Study Area; RSA) where project effects may interact with other past, present, and future activities, affecting regional resources or indicators. Some disciplines may justify using a single Project Study Area (PSA) for all assessments.

[C] Develop a Project Case for quantitative or qualitative comparison to the Baseline Case. The Project Case will examine a maximum impact scenario, including all Project construction activities as if they were developed simultaneously, and a future operations scenario, including all operating infrastructure and facilities following reservoir filling, reservoir aquatic development, and successful mitigations and reclamation of berms and temporary features.

[D] Identify mitigation objectives for each impact and describe the mitigation measures that will be implemented. Summarize the environmental protection, mitigation, and enhancement measures to be incorporated into the Project. Summarize how mitigation measures will avoid, minimize, or eliminate potential impacts for all stages of the Project. Discuss any required or recommended monitoring programs that would assist in understanding the effects of the project and effectiveness of mitigation measures. Identify how this monitoring would provide information that may result in new management activities.

[E] Assess residual environmental impacts by comparing the future operations Project Case including mitigation, to the Baseline Case for all indicators and resources. As per the Guide, methods will be developed to evaluate the environmental effects and criteria used to determine the "significance of the effects", and the proponent will provide rationale for the impact rating system used. Describe plans to manage residual impacts.

[F] For each discipline section, where potential regional interactions with resources or indicators have been identified, complete a cumulative effects assessment as per *Cumulative Effects Assessment in Environmental Impact Assessment Reports* and the Alberta Environmental Protection and Enhancement Act. Cumulative effects shall be assessed for indicators or resources where a negative Project-related change is assessed in the Environmental Impact Assessment, and for indicators or resources that can be reliably measured or predicted in a Regional Study Area. The assessment will be based on a Planned Development Case which will include past developments (up to Baseline), Project development, and Future developments including known, disclosed, and reasonably foreseeable developments and land use changes within the Regional Study Area. The cumulative effects assessment will be completed using qualitative and, where possible, quantitative analyses to examine regional-level changes in discipline specific indicators or resources comparing the relative contribution of the Project to all changes associated with the Planned Development Case. As per the *Guide to Preparing Environmental Impact Assessments in Alberta*, methods will be developed to evaluate the cumulative environmental effects and criteria used to determine the "significance of the effects", and the proponent will provide rationale for the cumulative effects rating system used. For certain indicators or resources, if established threshold values, limits, or management guidelines have been set for this region of Alberta, these may be used to aid in the assessment of cumulative effects.

3.1 Air Quality and Noise

3.1.1 Baseline Information

[A] Define the study area(s) that will be assessed for air quality and noise.

[B] Identify residences or other facilities that could be affected by construction noise and vibration, and air emissions or dust during construction or operations.

[C] Summarize information available on ambient air chemistry applicable to the study area, including gaseous chemicals mixed in the air and particulate matter or droplets carried within the air. Include the average and range of these components within a typical year.

[D] Identify the modelling or analytical method used to assess air quality for the Baseline Case and the input data required to parameterize the model or method for the study area. Discuss the accuracy and reliability of the model or method.

[E] Discuss baseline air quality conditions, including appropriate ambient air quality parameters.

[F] Summarize information available on ambient noise in or applicable to a study area. Identify key sources of noise, including the intensity and frequency of sound generated and the distance to the project site and to the nearest receptors.

[G] Identify the modelling or analytical method to characterize baseline noise conditions. Discuss the input data required to parameterize the model or method for this area. Discuss the accuracy and reliability of the model or method used in the study area.

[H] Discuss baseline noise conditions.

3.1.2 Impact Assessment

[A] Identify construction and operational components of the Project that have the potential to increase noise levels or affect air quality.

[B] Discuss the nature, severity, extent, and duration of activities likely to produce noise, vibration, and dust that could affect residences or other facilities during construction and operation, including the generation of dust from the reservoir slopes during drawdown.

[C] Use modelling or analytical techniques to predict air quality parameters and noise during construction, reservoir filling, and operations. Assess residual impacts.

[D] Discuss implications of predicted changes to noise and air quality parameters on soils, terrestrial vegetation, wildlife, and surface hydrology features, including wetlands;

[E] Describe how Project air quality and noise impacts will be mitigated, including emissions and noise management and monitoring plans, and complaint resolution, if applicable.

3.1.3 Cumulative Effects Assessment

[A] Discuss the Project's relative contribution to cumulative effects on regional air quality and noise.

3.2 Hydrogeology

3.2.1 Baseline Information

[A] Define the study area that will be assessed.

[B] Describe the geologic and hydrogeologic setting. Document any new hydrogeological investigations, including methods, analytical results, and interpretations undertaken as part of the EIA, and:

a) illustrate regional and Project Area geology (i.e., depth, thickness, and spatial extent of lithology, stratigraphic units, and structural features); and
b) describe regional and Project Area hydrogeology, including:
    i. major aquifers, aquitards and aquicludes (Quaternary and bedrock), their spatial distribution, properties, hydraulic connectivity, hydraulic heads, gradients, groundwater flow directions and velocities, and groundwater chemistry;
    ii. potential groundwater discharge zones, sources and zones of groundwater recharge, areas of groundwater-surface water interaction, and areas of Quaternary aquifer-bedrock groundwater interaction; and
    iii. an inventory of water well development and groundwater use.

3.2.2 Impact Assessment

[A] Describe project components and activities that could affect groundwater resource quantity and quality at all stages of the Project.

[B] Identify areas that may experience seepage from the reservoir and predicted interactions with aquifers or surface waterbodies. Describe mitigation measures to reduce or eliminate these effects.

[C] Describe spatial and temporal project impacts, and discuss:
a) the interrelationship between groundwater and surface water quantity and quality;
b) implications for terrestrial vegetation, wildlife, and surface hydrology features, including wetlands;
c) changes in groundwater quality and quantity;
d) potential conflicts with other groundwater users, and proposed resolutions to these conflicts;
e) groundwater protection, including whether current wells in the study area need to be reclaimed or capped prior to Project construction; and
f) implications of seasonal variations in water storage within the reservoir.

3.2.3 Cumulative Effects Assessment

[A] Based on the Planned Development Case, discuss the Project's relative contribution to cumulative effects on regional groundwater, including:
a) groundwater quality
b) groundwater quantity; and
c) conflicts with regional groundwater users.

3.3 Surface Waterbodies

3.3.1 Baseline Information

[A] Define and map Local and Regional Study Areas for hydrological assessment, and describe:
a) the rationale used to define these areas;
b) how the boundaries were determined; and
c) environmental conditions that affect hydrology in these areas, including climatic and topographical considerations.

[B] Obtain data on water quality and quantity for the Local Study Area including field programs for water collection and laboratory testing, and existing data on water input, outlet, and

storage levels within the Snake Lake Reservoir. Use information from recent aerial imagery, meteorological data relevant to the project site, and field data to map waterbodies and drainages in the Local Study Area.

[C] Map waterbodies in the Regional Study Area based on provincial hydrological data, Codes of Practice mapping, Fish and Wildlife Management Information System (FWMIS) or other sources at the highest possible resolution. If available, access data from provincial water quality monitoring programs within or applicable to the Regional Study Area.

[D] Describe baseline conditions and concentrations of surface water quality parameters for the existing reservoir and a sample of natural waterbodies, including routine parameters, nutrients, biochemical oxygen demand, organics, fecal coliforms, total metals, dissolved metals, ultra-low mercury, methylmercury, volatile organic compounds (BTEX), and polycyclic aromatic hydrocarbons. Provide a rationale for the selection of sampled waterbodies.

[B] Describe baseline surface water quantity characteristics, including:

a) seasonal variation of flow and water storage in the inlet canal, existing reservoir, and outlet canal; and
b) seasonal variation, flow, or depth in a sample of natural waterbodies within the project development area.

[C] Identify local sites susceptible to erosion and sedimentation.

3.3.2 Impact Assessment

[A] Identify project activities that may affect surface waterbodies during all stages of the Project, including site preparation, construction, reservoir filling, and operations.

[B] Describe and discuss potential changes to water quality of the reservoir and natural waterbodies during Project stages, noting any potential exceedances of the *Environmental Quality Guidelines for Alberta Surface Waters*, the *Canadian Water Quality Guidelines for the Protection of Aquatic Life*, *Agriculture*, or *Recreation*, or of the *Water Quality Management Framework* (WQMF) in the South Saskatchewan Regional Plan.

[C] Discuss changes to surface and near-surface drainage conditions surrounding the expanded reservoir such as flow impediments, run-off capture, and open water surface areas.

[D] Describe surface hydrological changes that may occur due to changes in subsurface flow and surface seepage as per the hydrogeological assessment, and:

a) include changes and timing to the quantity of surface flow and water levels in lentic and lotic waterbodies surrounding the expanded reservoir;
b) assess the potential effect on local hydrology; and
c) quantify potential changes in runoff rates and volumes before, during, and after construction of the Project, including potential effects on erosion and sedimentation.

[D] Discuss how potential hydrological impacts of new temporary and permanent roads will be minimized and mitigated. Identify if a Code of Practice notification for crossing a waterbody is required or if a *Water Act* application for approval of temporary to permanent direct or indirect effects on waterbodies is required.

[E] Describe mitigation measures to address surface water quality and quantity impacts during all stages of the Project, including:

a) alteration in flow regimes;

b) potential flood events; and
c) increased loading of water quality parameters of concern.

3.3.3 Cumulative Effects Assessment

[A] Based on the Planned Development Case, discuss the Project's relative contribution to cumulative effects on:

a) water quantity (e.g., timing, volume, peak and minimum flow rates of water courses or waterbody levels); and
b) water quality (e.g., physical parameters, nutrients, dissolved metals, methyl mercury, ultra-low mercury, petroleum hydrocarbons, volatile organic carbon, polycyclic aromatic hydrocarbons, and fecal coliforms).

3.4 Aquatic Environment Resources

3.4.1 Baseline Information

[A] Define and map Local and Regional Study Areas, and:

a) describe the rationale used to define the Local and Regional Study Areas considering the location and range of probable project and cumulative effects; and
b) illustrate the boundaries of the Local and Regional Study Areas.

[B] Describe existing fish populations in waterbodies within the Local Study Area. Identify species composition, distribution, relative abundance, seasonal movement trends, and general life history parameters, and:

a) qualify fish species occurrence based on spring and fall sampling events over one year of sampling, using methods that will minimize fish mortality.
b) identify any fish species that are:
    i. listed as "At Risk", "May Be At Risk" or "Sensitive" in *The Status of Alberta Wild Species* (Alberta Environment and Parks);
    ii. listed as "Threatened" or "Endangered" under the Alberta *Wildlife Act*;
    iii. listed as "Threatened" or "Endangered" under Schedule 1 the federal *Species at Risk Act*;
    iv. listed as "Threatened" or "Endangered" by The Committee on the Status of Endangered Wildlife in Canada (COSEWIC); and
    v. sportfish and/or traditionally used species; and
    vi. invasive fish species; and
c) select (and rationalize) key indicator fish species for habitat assessment.

[C] Address habitats for key indicator fish species in the Local Study Area and any other connected water bodies, including:

a) mapping and describing physical characteristics of habitats used seasonally or year-round, including critical or sensitive habitats areas, such as spawning, rearing, and over-wintering habitats; and
b) assessing water quality parameters that may affect suitability for fish.

[D] Discuss the current and potential human use of fish resources.

[E] Identify waterbodies in the Regional Study Area that maintain fish species and any information that can be used to classify the types of habitats present. Identify if there is direct or indirect connectivity to the Project.

3.4.2 Impact Assessment

[A] Describe and assess the potential impacts to fish and fish habitat during site preparation, construction, reservoir filling, and operation stages of the Project, including:

a) change in quality and availability of habitat;
b) survival of eggs and fry, chronic or acute health effects, and increased stresses on fish populations from contaminants, bioaccumulation of methylmercury, sedimentation, flow alterations, or from temperature and habitat changes;
c) changes to riparian areas that could affect aquatic biological resources and productivity; and
d) changes to benthic invertebrate communities that may affect food quality and availability for fish.

[B] Discuss how project design and mitigation measures will be incorporated into the Project to minimize impacts to fish and their habitats and protect aquatic resources.

[C] Identify plans to offset loss of productivity, or to enhance fish habitat in the expanded reservoir. Indicate how environmental protection plans address applicable provincial and federal policies on fish habitat protection.

[D] Discuss the potential impacts of new water control structures on seasonal fish movements, relative to baseline conditions.

[E] Discuss the potential effects on fish and their habitat during the filling of the expanded reservoir and decommissioning of the existing East Dam, including mitigations to protect fish during the filling process.

[F] Discuss the potential for aquatic invasive species to establish and spread from the Project Area.

[G] Discuss the effects of the expanded reservoir on recreational fishing.

3.4.3 Cumulative Effects Assessment

[A] Based on the Planned Development Case, describe the Project's relative contribution to changes in:

a) fish and aquatic resources; and
b) fish habitat.

3.5 Terrain and Soils

3.5.1 Baseline Information

[A] Define and map Local and Regional Study Areas, and:

a) describe the rationale used to define the Local and Regional Study Areas considering the location and range of probable project and cumulative effects; and
b) illustrate the boundaries of the Local and Regional Study Areas.

[B] Provide descriptions and maps of terrain and soil resources in the Local Study Area, including:

a) surficial geology and topography;
b) soil types and distribution, including description of soil profiles;
c) agricultural land capability;
d) soil capability of reclamation;

e) erosion sensitive and saline-sodic soils; and
f) an inventory of soils affected by erosion or human use.

[C] Use existing inventory from the Agricultural Region of Alberta Soil Inventory Database (AGRASID), Grassland Vegetation Inventory (GVI) or other sources to map terrain and soil classes at the regional level. Describe these regional soils.

3.5.2 Impact Assessment

[A] Describe project activities during construction and operations that could affect terrain and soil resources, including:

a) assessing and mapping the area of terrain types, surface soil types, and soil capabilities, to be stripped, left intact, and reclaimed;
b) calculating the volume and suitability of soil materials for reclamation;
c) any constraints or limitations to successfully reclaiming soils based on anticipated soil conditions (e.g., compaction, contamination, salinity, soil moisture, nutrient depletion, or erosion) which occur naturally or due to the Project;
d) the potential for soil erosion, slope instability, and other geohazards in intact and reclaimed areas; and
e) soil capability for agriculture or other land uses during project operations.

[B] Provide a mitigation plan, including:

a) measures to minimize surface disturbance;
b) actions to mitigate compaction, contamination, salinity, soil moisture issues, nutrient depletion, and erosion;
c) actions to address impacts to land capability; and
d) any other measures to reduce, eliminate, or offset effects on soil classes, capability and/or quality.

3.5.3 Cumulative Effects Assessment

[A] Based on the Planned Development Case, describe the Project's relative contribution to cumulative effects on terrain and soil resources.

3.6 Vegetation

3.6.1 Baseline Information

[A] Define and map Local and Regional Study Areas, and:

a) describe the rationale used to define the Local and Regional Study Areas considering the location and range of probable project and cumulative effects, and
b) illustrate the boundaries of the Local and Regional Study Areas.

[B] Describe and map local vegetation communities including ecological range/community classes and anthropogenically modified classes. Describe each vegetation community based on any available data, including occurrence and relative abundance (cover) of dominant species, species richness or diversity metrics, soil characteristics, and topographical or site characteristics.

[C] Identity the occurrence of plant "species of conservation concern", defined as species that are:

a) listed as "Endangered", "Threatened", or "Special Concern" under Schedule 1 of the federal *Species at Risk Act*, or

b) listed as “Endangered”, “Threatened”, or “Special Concern” by COSEWIC, or
c) listed as “Threatened” or “Endangered” in the Alberta *Wildlife Regulation*, or
d) plant species on the current “Tracking List” or “Watch List” of the Alberta Conservation Information Management System (ACIMS).

[D] Identify the occurrence of plant “communities of conservation concern”, defined as associations of plant species that are on the current “Tracking List” or “Watch List” of the ACIMS Ecological Community Tracking List.

[E] Discuss the potential of each vegetation community to support plant “species of conservation concern” “communities of conservation concern” and traditionally used plant species.

[F] Identify the occurrence and distribution of Prohibited Noxious and Noxious weeds, and of other non-native plant species.

[G] Describe and quantify the current extent of community fragmentation due to anthropogenic land disturbances.

[H] Identify, classify, and map wetlands in the Local Study Area as per the *Alberta Wetland Classification System* and the *Alberta Wetland Policy* and associated directives. Identify, describe, and map other surface hydrological features including springs, ephemeral waterbodies, ephemeral drainages, watercourses, and anthropogenic waterbodies. Describe these hydrological features, including:
a) distribution and area of each class;
b) wetland function and relative wetland value per the Alberta Wetland Rapid Evaluation Tool Actual (ABWRET-A); and
c) dominant and indicator plant species, observed wildlife, basin characteristics, topographical influences and capture basins, soil characteristics, and hydrology including assessed hydroperiod and mineralogy.

[I] Use regionally available datasets including Grassland Vegetation Inventory, Alberta Merged Wetland Inventory, AGRASID, Alberta Biodiversity Monitoring Institute (ABMI) mapping or other sources to map and describe general vegetation classes and wetlands within the Regional Study Area.

3.6.2 Impact Assessment

[A] Quantify and map the area of each vegetation community and wetland class that will be:
a) altered or removed by the Project; or
b) temporarily affected and reclaimed.

[B] Discuss the predicted loss, alteration, or fragmentation of native grassland due to the Project.

[C] Identify vegetation community classes or wetlands that should be avoided and protected during construction, where possible.

[D] Discuss impacts the Project may have on plant “species of conservation concern”, “communities of conservation concern” or traditionally used species.

[E] Discuss the expected timelines for establishment and recovery of ecological range/community classes in reclaimed areas. Discuss how similar these reclaimed classes are

expected to be (compared to natural community classes) in plant cover, species composition, and soil/site characteristics.

[F] Discuss how meeting avoidance, minimization, mitigation, and wetland replacement requirements in the *Alberta Wetland Policy*, and how reclamation and restoration of natural community classes will be used to reduce the project impacts on native grasslands, wetlands, and ecological/community classes. Identify any other opportunities for mitigating effects or offsetting losses.

[G] Discuss strategies for control of weeds and other non-native species during construction, berm reclamation, and operations.

3.6.3 Cumulative Effects Assessment

[A] Based on the Planned Development Case, describe the Project's relative contribution to cumulative effects on:

a) native grassland communities;
b) populations of plant "species of conservation concern" and "communities of conservation concern"; and
c) wetlands.

3.7 Wildlife and Wildlife Habitat

3.7.1 Baseline Information

[A] Define and map Local and Regional Study Areas, and:

a) describe the rationale used to define the Local and Regional Study Areas considering the location and range of probable project and cumulative effects; and
b) illustrate the boundaries of the Local and Regional Study Areas.

[B] Describe and map existing vertebrate wildlife resources (amphibians, reptiles, birds, and mammals) in the Local Study and Regional Study Areas, based on best available data, in terms of:

a) spatial occurrence;
b) habitat associations;
c) use of habitats for nesting, denning, foraging, protection, movement, or other uses; and
d) abundance, species richness and diversity.

[C] Map known occurrences of wildlife "species of conservation concern" that are:

a) listed as "Endangered", "Threatened", or "Special Concern" under Schedule 1 of the federal *Species at Risk Act*;
b) listed as "Endangered", "Threatened", or "Special Concern" by COSEWIC;
c) listed as "Threatened" or "Endangered" in the Alberta *Wildlife Regulation*;
d) listed as "At Risk", "May Be At Risk", or "Sensitive" in the *General Status of Alberta Wild Species 2020*.

[D] Identify and justify the selection of key wildlife and biodiversity indicators for assessment. Wildlife indicators may include individual species, taxonomic groups, or wildlife communities. Biodiversity indicators may include indices of species diversity, fragmentation, or connectivity. Describe, quantify, and map baseline habitat quality (e.g., suitability or capability) for each indicator.

3.7.2 Impact Assessment

[A] Describe and assess the potential impacts of the Project on wildlife, wildlife habitat, and biodiversity due to changes in habitat class areas and distribution, habitat quality, sensory disturbances, direct and indirect interactions with humans, habitat fragmentation, and connectivity, including:

a) effects on wildlife occurrence, abundance, and quality or use of habitats;
b) effects on wildlife movement and access to habitat areas; and
c) effects on biodiversity and species richness;

[B] Describe and assess the Project's potential effects on wildlife mortality, including:

a) potential direct causes of mortality such as inundation, vehicle-wildlife collisions, and release of contaminants; and
b) potential indirect causes of mortality such as disturbance and displacement of animals;

[C] Describe how wildlife may be affected during filling of the expanded reservoir;

[D] Describe the resilience and recovery capabilities of wildlife populations and habitats to disturbance.

[E] Provide a strategy and mitigation plan to avoid or minimize impacts on wildlife and wildlife habitat for all stages of the Project considering:

a) consistency of the plan with applicable regional, provincial, and federal wildlife habitat objectives and policies;
b) pre-clearing of vegetation prior to the main breeding season, to reduce nesting and denning opportunities, such that wildlife interactions should be reduced during construction operations in the breeding season;
c) measures to prevent human-wildlife encounters, especially encounters between equipment/vehicles and wildlife, including activities within the project site and within access roads used by workers and equipment to travel to the project site;
d) use of pre-construction wildlife sweeps within the main breeding seasons to identify species in need of protection;
e) the use of setbacks to protect habitat areas and timing restrictions during critical periods to protect "species of conservation concern" during construction and operations;
f) measures to prevent wildlife from contacting or ingesting harmful substances;
g) use of access controls or other management strategies to improve connectivity across access roads and protect wildlife during construction and operations;
h) management of noise, lighting, and use of equipment to reduce sensory disturbance effects;
i) installation of offset habitat structures such as nesting platforms in suitable offsite habitat areas;
j) programs to capture and transport sensitive wildlife to suitable offsite habitat areas;
k) use of habitat enhancements or planting of selected species to improve habitat quality in areas temporarily affected by the Project;
l) measures to deter use of reservoir substrate for nesting or denning prior to filling of the expanded reservoir;
m) measures to enhance use of the new reservoir for use by aquatic and semiaquatic wildlife species.

3.7.3 Cumulative Effects Assessment

[A] Based on the Planned Development Case, describe the Project's relative contribution to cumulative effects on:

a) wildlife habitat quality;
b) movement patterns and distribution; and
c) wildlife "species of conservation concern".

3.8 Climate Change

3.8.1 Baseline Information

[A] Define and map a Study Area applicable for the assessment of climate in and around the Project area.

[B] Obtain historical and current meteorological data applicable to the study area. Map the locations and describe the years over which different types of meteorological data were measured.

[C] Summarize and/or extrapolate the data for the Project site to describe normal or average climate, including variables such as temperature, windspeed and direction, and precipitation. Select climatic indicators specific to this region of the province relating to agricultural productivity. These may include indicators such as mean summer temperature, frost free-days, total precipitation, potential evapotranspiration, moisture deficits, and drought persistence and severity. Describe each indicator and explain why it is relevant to the assessment of climate and climate change.

[D] Assess the historical risk and occurrence of extreme weather events. Identify how these events may have affected flooding occurrence and severity, water supply, changes to soil water conditions, and agricultural productivity.

3.8.2 Future Climatic Conditions

[A] Select a modelling or prediction approach to assess changes in climate and occurrence risk for extreme meteorological events (e.g., severe storms, droughts) at selected time-steps over this and the next century. Gather and vet data to parameterize the climate change model(s) or prediction methods that are applicable to the local area where possible. Provide information on the likely reliability of the predictions over time, based on peer reviews, sensitivity analysis, back-casting, model comparisons, or other methods. Provide a range of inputs to address likely and worst-case scenarios input conditions that may affect future climate and weather events.

[B] Based on the above approach, calculate the most likely and worst-case climate indicators and risks for severe meteorological events at the selected time-steps.

[C] Discuss implications of predicted climate change on the Project, integrating information from the various environmental and cultural disciplines in this EIA, including:

a) Changes to soil moisture and salinity in natural and reclaimed habitats on the berms, potential for increased bare soil patches, and increased erosion potential during severe storms.
b) Effects on plant communities, weeds, and "species or communities of conservation concern" in surrounding areas of the Project.

c) Effects on wildlife behaviours such as the need to cool in hot conditions, to find water in droughts, and to shelter from severe storms. Discuss potential effects on wildlife abundance and "species of conservation concern."
d) Effects on hydrology and water management due to increased incidence of droughts and the need for offsite storage water to meet current downstream agricultural needs. In addition, address increased water needs resulting from a longer growing season, more snow-free winter conditions, and potential for more high temperature periods - resulting in a greater need for irrigation throughout the year. Discuss the difference in meeting annual irrigation needs with and without the Project. Additionally, address the potential for increased evaporation of water from the reservoir and increased wave action and bank erosion during severe storms. Provide a water management strategy if the Bow River runs too low in future years to fill the reservoir.
e) Increased potential for grass fires throughout the year with implications for safety and maintenance of infrastructure.
f) Discuss the benefits of the Project at a regional scale regarding its ability to lessen effects of climate change. Explain how drier conditions would affect the long-term viability of agriculture of the region with and without the Project.

4 SOCIO-CULTURAL ASSESSMENT

4.1 Land Use and Management

4.1.1 Baseline Information

[A] Define and map Local and Regional Study Areas, and:
a) describe the rationale used to define the Local and Regional Study Areas considering the location and range of probable project and cumulative effects; and
b) illustrate the boundaries of the Local and Regional Study Areas.

[B] Describe and map the current land uses in the Local and Regional Study Area, including:
a) land ownership status by category (e.g., federal or provincial Crown lands and waterbodies, First Nation reserves, road allowances, irrigation infrastructure, municipal lands, lands held in trust or under easements, and private lands);
b) jurisdictions and designated land use classes that overlap the study areas including wildlife management units, fur management zones, fish management zones, key wildlife and biodiversity areas, irrigation districts, tourism districts, etc.);
c) current land uses including agricultural land classes, oil and gas developments, renewable energy production sites, quarries, tourism and recreation facilities (e.g., campgrounds and trails), commercial/industrial sites, farmsteads and acreages, roads and related infrastructure, railways, utilities, irrigation infrastructure, flood protection structures, communication sites, other infrastructure, recently disturbed or reclaimed lands, residential properties, and public or non-profit institution lands (including schools, churches, and cemeteries);
d) lands known to maintain subsurface resources such as aggregate deposits and aquifers;
e) lands are used for outdoor recreational activities (e.g., hunting, fishing, hiking, plant harvesting, trail riding, boating, other non-motorized activities, off-highway vehicle use, picnicking, and camping), scientific studies, outdoor education, cultural, spiritual, or other traditional activities, and Indigenous uses;

f) infrastructure, facilities, or other anthropogenic features, including water wells, diches, dugouts, cairns or monuments, outbuildings, and storage sites;
g) an inventory of surface water users who have existing water approvals or licences;
h) unique sites or special features, such as Parks and Protected Areas, Heritage Rivers, Historic Sites, Environmentally Significant Areas, culturally significant sites, and unique geological or biological features (e.g., springs, outcrops, wetlands, critical wildlife habitats).

[C] Identify federal, provincial, and municipal legislation and guidelines that require approvals to alter land and resource uses or need to be followed for maintaining current land and resource uses.

[D] Identify any land use policies and resource management initiatives or strategies related to the Project (e.g., South Saskatchewan Regional Plan, Bow River Basin Council Watershed Management Plan, County of Newall Planning or Strategy Documents, Intermunicipal Plans, Development plans, and Provincial Irrigation Strategy) and discuss how the Project will be consistent with the intent of these initiatives.

[E] Identify opportunities for integrated land management such as roads, infrastructure, and recreational opportunities.

4.1.2 Impact Assessment

[A] Describe anticipated changes to nearby road and canal infrastructure.

[B] Identify the potential effects of the Project on land uses, including effects on:
a) unique sites or special features;
b) public access, including access for hunters, anglers, other recreational users and access to traditional land use sites.

[C] Assess the likelihood of fish contamination due to bioaccumulation of methylmercury and effects this could have on reservoir use for fishing.

[D] Address the implications of relevant land use policies and resource management initiatives for the Project, including any constraints to development.

[E] Identify existing private land uses the Project will directly affect, and describe the:
a) area of land affected and the nature of the impacts;
b) opportunities for mitigation and compensation, including the cost of implementation; and
c) procedures that will be followed to ensure landowners receive fair compensation for lands required for the Project and for any damages or disturbances.

[F] Discuss mitigation strategies, including:
a) the need and plans for addressing access management during and after project operations (e.g., for public and traditional users);
b) the process for addressing the needs of other land users in the Project Area; and
c) project effects that may lead to changes in land use.

4.2 Historical Resources

4.2.1 Baseline Information

[A] Identify a Project Area for assessment of historical resources.

[B] Describe consultation with Alberta Arts, Culture, and Status of Women (ACSW) concerning the need for Historical Resource studies for the Project.

[C] Summarize previous historic resource studies or Historic Resources Impact Assessments within or near the Project Area, including assessments of archaeological resources, paleontological resources, and historic use sites in the Project Area.

[D] Describe and map known historic resources sites in the Project Area.

[E] Document any historic resource concerns raised during Project engagement.

[F] Summarize *Historical Resources Act* requirements and/or clearances that have been issued for the Project Area to date.

[G] Identify locations within the Project Area that may contain previously unrecorded historic resources. Describe the methods used to identify these areas.

4.2.2 Impact Assessment

[A] Summarize results of the Historic Resources Impact Assessment and Historical Resources Impact Mitigation reports completed for the project.

[B] Discuss how monitoring and mitigation will be used during Project construction to minimize effects on paleontological resources that may be affected during site excavation.

4.3 Traditional Use

[A] Define and rationalize a Study Area for assessment of Traditional Use focusing on the lands on or near the existing reservoir and reservoir expansion area.

[B] Provide a map and description of potential Traditional Use areas in the Study Area. Include the following information:

a) lists of traditionally used species;
b) abundance and availability of traditionally used plants, fish, and wildlife used for food, medicine, and cultural purposes;
c) potential access and activity sites, including fishing sites and plant/material gathering sites;
d) nutritional, medicinal, or cultural plant harvesting locations, if known;
e) other traditional use sites identified during studies of historic resources.

[C] Discuss any limitations to access for traditional uses during all stages of the Project.

[D] Determine the impacts and benefits of the Project on traditional uses and identify strategies to encourage or improve Traditional Use in the Study Area.

4.4 Public Health and Safety

4.4.1 Public Health

[A] Describe how the Project may impact public health or the delivery of regional health services. Assess possible implications for public health arising from the Project.

[B] Document any health concerns raised during Project engagement and how these were addressed.

[C] Document any health concerns identified by Indigenous communities during project engagement and how these were addressed.

[D] Assess potential for human health impacts due to bioaccumulation of methylmercury in fish, dust or air emissions, or noise.

[E] Describe any health impacts from increased regional traffic volumes, and the increased risk of contamination due to leaks and spills on water or soil resources and effects on food sources, including plant and animal sources.

[F] Discuss potential health impacts on public or Indigenous users of the Project site during operations due to unforeseen accidents or malfunctions.

4.4.2 Public Safety

[A] Describe aspects of the Project that may impact public safety.

[B] Describe how local residents will be contacted during an emergency, and the type of information that will be communicated.

[C] Discuss mitigation plans to ensure workforce and public safety during construction and operation of the Project.

4.5 Socio-economic Assessment

4.5.1 Baseline Information

[A] Define and justify a Regional Study Area (RSA) for assessment of Socio-economic conditions and effects of the Project.

[B] Describe the existing socio-economic conditions in the RSA and communities therein. Describe factors that may affect existing socio-economic conditions including:

a) changes in population and demographics;
b) income and employment;
c) housing and land costs;
d) education;
e) recreation opportunities;
f) protective services;
g) infrastructure services; and
h) municipal finance.

[C] Describe the socio-economic importance of the role of irrigation in supporting:

a) current farm operations in the study area;
b) non-agricultural consumptive uses of water including, licensed and unlicensed uses;
c) non-consumptive uses of water, including recreation;
d) the effectiveness of irrigation in mitigating the effects of drought on agriculture and other consumptive water uses and non-consumptive water uses in the study area and on the regional economy; and,
e) the long-term socio-economic stability of local and regional communities.

4.5.2 Impact Assessment

[A] Describe how Project operation will affect agricultural and other activities within the regional area, especially during drought conditions.

[B] Provide the estimated project capital and operating costs, including:

a) engineering and project management;
b) equipment and materials, including local and regional procurement policies;
c) labour for both construction and operation stages, including local and regional training and/or hiring strategies; and
d) annual maintenance costs.

[C] Describe Project construction and operation socio-economic impacts on:

a) landowners;
b) construction and related businesses;
c) local training and employment opportunities;
d) housing;
e) hospitality businesses;
f) community services, such as health care services and policing;
g) recreational activities including fishing and boating;
h) traditional land use, and
i) regional communities

[D] Discuss how the Project construction schedule will affect the flow of benefits to regional communities.

[E] Discuss options:

j) to work with local and regional residents and businesses regarding economic development opportunities arising from the Project; and
k) to mitigate socio-economic concerns raised by the local and regional municipalities and other stakeholders.