

**PROPOSED TERMS OF REFERENCE
ENVIRONMENTAL IMPACT ASSESSMENT REPORT**

SPECIAL AREAS WATER SUPPLY PROJECT

Located in East-Central Alberta

Special Areas 2, 3 and 4, County of Stettler and County of Paintearth

ISSUED BY: **Alberta Transportation**

DATE: **December 15, 2017**

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PROJECT OVERVIEW

The Special Areas Water Supply Project is a multi-purpose water supply project that would divert water from the Red Deer River to a large portion of east-central Alberta, including the Special Areas. The proposed project consists of a pump station and pipeline to divert water from the Red Deer River southwest of Stettler through a 97.5 kilometre pipeline to a storage reservoir at the headwaters of Sounding and Berry creeks at the north western boundary of the Special Areas. Water would be distributed within the Sounding and Berry Creek basins through existing streams, improved natural channels, and canals. Reservoirs would store and release water for various uses.

PURPOSE OF THE TERMS OF REFERENCE

The purpose of this document is to identify for Alberta Transportation, the public, aboriginal communities and stakeholders the information required by government agencies for an Environmental Impact Assessment (EIA) report prepared under the *Environmental Protection and Enhancement Act* (EPEA) for the Special Areas Water Supply Project (the Project).

SCOPE OF THE EIA REPORT

The Proponent shall prepare and submit an EIA report that examines the environmental and socio-economic effects of the Project.

The EIA report shall be prepared considering all 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 associated regulations, and the *Canadian Environmental Assessment Act*. The EIA report will form part of the Proponent's application to the Natural Resource Conservation Board (NRCB). An EIA report summary will also be included as part of the NRCB Application.

The Proponent shall refer to the *Guide to Preparing Environmental Impact Assessment Reports in Alberta* published by Alberta Environment and Parks (the Guide) and these Terms of Reference. In any case where there is a difference in requirements between the Guide and these Terms of Reference, the Terms of Reference shall take precedence.

CONTENT OF THE EIA REPORT

1 PUBLIC ENGAGEMENT AND INDIGENOUS CONSULTATION

- [A] Document the public engagement program implemented for the Project including:
 - a) a list of all meetings and the specific comments or issues raised at the meetings;
 - b) a description and documentation of concerns and issues expressed by the public, the Proponent's analysis of those concerns and issues, and the actions taken to address those concerns and issues; and
 - c) how public input was incorporated into the Project development, impact mitigation and monitoring.
- [B] Document the aboriginal consultation program implemented for the Project including:
 - a) a list of all meetings and the specific comments or issues raised at the meetings;

- b) a description and documentation of concerns and issues expressed by aboriginal communities and groups, the Proponent's analysis of those concerns and issues, and the actions taken to address those concerns and issues;
 - c) how aboriginal input was incorporated into the Project development, impact mitigation and monitoring; and
 - d) the consultation undertaken with aboriginal communities and groups with respect to traditional ecological knowledge and traditional use of land.
- [C] Describe plans to maintain the public engagement and aboriginal consultation process following completion of the EIA report to ensure that the public and aboriginal peoples will have an appropriate forum for expressing their views on the ongoing development, operation and reclamation of the Project.

2 PROJECT DESCRIPTION

2.1 Overview

- [A] Identify the legal entity that is the champion for the Project, the legal entity 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] Outline the original purpose and rationale for the project including the roles of various government departments and agencies and non-governmental organizations. Discuss the current need for the project including:
- a) grazing lands that could potentially benefit from water supply as a result of this Project and discuss potential changes in productivity and livestock use;
 - b) new lands that could be irrigated as a result of this Project and potential changes in agriculture practices on these lands and on lands currently without a secure water supply;
 - c) potential wetlands enhancement that may result from the development of the Project; and
 - d) provide an estimate of future trends in water demand for the Project Area.
- [C] Describe and provide maps and/or drawings of all components of the Project, including, but not limited to, the water supply, storage facilities and reservoirs and any associated works.
- [D] Provide generalized project phasing and a construction schedule.
- [E] Discuss the alternatives for the Project and reasons for not selecting any identified alternatives.
- [F] Discuss the implications resulting from a delay in proceeding with the Project, or any phase of the Project, and the implications of not going ahead with the Project.

2.2 Summation

- [A] Discuss the overall economic, environmental and social impacts of the project in comparison to its economic, environmental and social benefits.

2.3 Constraints

- [A] Discuss the process and criteria used to identify constraints to development and how the project was designed so that it meets the objectives and goals of:

- a) any applicable Alberta Land Stewardship Regional Plan, sub-regional plan or watershed plan;
 - b) apportionment agreement with Saskatchewan and how the apportionment commitments are met;
 - c) applicable Municipal Plans; and
 - d) the Government of Alberta Rural development Initiative and Rural Development Strategy.
- [B] Describe the process and criteria used to select sites for Project infrastructure, including:
- a) water storage sites;
 - b) the selection of conveyance methods (e.g., natural, canal or pipeline);
 - c) water intake location; and
 - d) the multi-use projects.
- [C] Identify any roads, pipelines, wellsites, power lines or other infrastructure that may be affected by the project.
- [D] Document any communication with the owner of the infrastructure regarding potential impacts and relocation requirements and any other measures required to mitigate permanent or short-term impacts.
- [E] Describe any proposed protection, relocation or reconstruction of infrastructure and measures proposed to mitigate impacts during construction.
- [F] Discuss the route or site selection criteria for any linear or other infrastructure development or modification and provide the rationale for selecting the proposed alignment and design.

2.4 Regional and Cooperative Initiatives

- [A] Discuss the Champions' and Proponent's involvement in regional and cooperative efforts to address environmental and socio-economic issues associated with regional development.
- [B] Describe opportunities for sharing infrastructure (e.g., access roads, utility corridors, water infrastructure) with other resource development stakeholders. Provide rationale where these opportunities will not be implemented.
- [C] Discuss potential cooperation with other parties regarding water related infrastructure and management including, but not limited to, water intakes, pipelines, water storage and withdrawals, flow monitoring and reporting and ecological monitoring.

2.5 Water Management

- [A] Describe and map the surface hydrology of the Red Deer River watershed in the vicinity and downstream of the water intake/pumping station, Berry Creek, Sounding Creek, Shooting Lake and any other connected water bodies. Include flow regimes of creeks, streams and rivers in the Project Area.
- [B] Provide surface flow baseline data, including:
 - a) seasonal variation, low, average and peak flows and trends for watercourses; and

- b) low, average and peak levels and trends for waterbodies.
- [C] Describe the characteristics of the recreational resources before and after the implementation of the Project and diversion plan.
- [D] Describe the extent to which the use of water-based traditional, commercial and recreational resources may be changed as a result of the Project.
- [E] Discuss the potential implications to downstream users from the diversion on the Red Deer River.
- [F] Discuss the potential implications for any proposed projects identified.
- [G] Describe how the Project is considered an inter-basin transfer and discuss how potential impacts will be managed.

2.6 Conservation and Reclamation

- [A] Provide a conceptual Conservation and Reclamation Plan for the project.

3 ENVIRONMENTAL ASSESSMENT

3.1 Air Quality and Noise

3.1.1 Baseline Information

- [A] Identify residences or other facilities that could be affected by construction noise and vibration or dust from construction or operation.

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.
- [C] For reservoirs, assess the probability of soil drifting during reservoir draw-down. If the probability is significant, discuss the frequency, severity, potential impacts and mitigation measures.
- [D] Describe how air quality and noise impacts resulting from the Project will be mitigated including noise management and monitoring plans and complaint resolution, if applicable.

3.2 Climate Change

3.2.1 Baseline Information

- [A] Describe climate norms and variability as they relate to agricultural productivity in the project area.
- [B] Identify elements of the project that are sensitive to changes or variability in climate parameters, including frequency and severity of extreme weather events.

3.2.2 Impact Assessment

- [A] Discuss the benefits of the project on the affected area with regards to its ability to counteract climate change impacts and the associated risks.

3.3 Hydrogeology

3.3.1 Baseline Information

- [A] Provide an overview of the existing geologic and hydrogeologic setting. Document any new hydrogeological investigations, including methodologies, analysis results and interpretations, undertaken as part of the EIA, and:
 - a) present regional and Project Area geology to illustrate depth, thickness and spatial extent of lithology, stratigraphic units and structural features; and
 - b) present regional and Project Area hydrogeology describing:
 - i) the major aquifers, aquitards and aquicludes (Quaternary and bedrock), their spatial distribution, properties, hydraulic connections between aquifers, hydraulic heads, gradients, groundwater flow directions and velocities and groundwater chemistry,
 - ii) the potential groundwater discharge zones, potential 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.

3.3.2 Impact Assessment

- [A] Describe Project components and activities that have the potential to affect groundwater resource quantity and quality at all stages of the Project.
- [B] Identify areas that may experience seepage from canals and reservoirs and how the seepage could be mitigated.
- [C] Describe the nature and significance of the potential Project impacts spatially and temporally on groundwater with respect to:
 - a) inter-relationship between groundwater and surface water in terms of surface water quantity and quality;
 - b) implications for terrestrial or riparian vegetation, wildlife and aquatic resources including wetlands;
 - c) changes in groundwater quality and quantity; and
 - d) conflicts with other groundwater users, and proposed resolutions to these conflicts.

3.4 Surface Water

3.4.1 Baseline Information

- [A] Describe the surface water management strategy for all stages of the Project, including:
 - a) design factors considered, such as:
 - i) site drainage,
 - ii) run-on and run-off management,
 - iii) erosion/sediment control,
 - iv) geotechnical stability concerns,
 - v) groundwater and surface water protection,
 - vi) groundwater seepage,
 - vii) return flow,
 - viii) flood protection, and
 - ix) on-going hydrometric monitoring;

- b) permanent or temporary alterations or realignments of watercourses, wetlands and other waterbodies;
 - c) the pre and post-disturbance alignment and condition of all ephemeral and permanent streams, wetlands and waterbodies including those created by the Project; and
 - d) factors used in the design of water management facilities with respect to the Canadian Dam Safety Association Dam Safety Guidelines, including expected floods and flood protection.
- [B] Describe navigated waterways and the results of navigation assessment(s) for waterways that may be affected by the Project.
- [C] Provide details of watercourse crossing including:
- a) type of water course crossing, construction methods and anticipated flows during construction;
 - b) location; and
 - c) details on capacity of crossing to withstand extreme flood events including design flood and design criteria used for the crossing.

3.4.2 Impact Assessment

- [A] Discuss changes to watersheds, including surface and near-surface drainage conditions, potential flow impediment, natural runoff captured in the system and potential changes in open-water surface areas caused by the Project including but not limited to local impacts caused by roads and canals (linear features).
- [B] Describe the extent of hydrological changes that will result from disturbances to groundwater and surface water movement, and:
- a) include changes and timing of those changes to the quantity of surface flow, water levels and channel regime in watercourses (during minimum, average and peak flows) and water levels in waterbodies;
 - b) assess the potential impact of any alterations in flow on the hydrology and identify all temporary and permanent alterations, channel realignments, disturbances or surface water withdrawals;
 - c) assess changes in runoff rates and volumes before, during and after construction of the Project;
 - d) discuss both the Project and cumulative effect of these changes on hydrology (e.g., timing, volume, peak and minimum flow rates, river regime and lake levels), including the significance of effects for downstream watercourses; and
 - e) identify any changes in erosion in watercourses resulting from the Project.
- [C] If water conservation objectives are set, discuss how they will be maintained with changes to the flow regime resulting from the Project.
- [D] Discuss changes to surface and groundwater movement resulting from the diversions, construction and operation of the reservoirs.
- [E] Discuss changes to river bed and bank erosion including changes in sedimentation patterns resulting from the Project.
- [F] Describe impacts on other surface water users resulting from the Project. Identify any potential water use conflicts.

- [G] Describe potential downstream impacts due to surface water withdrawal.
- [H] Discuss the impact of low flow conditions and in-stream flow needs on water supply and water and wastewater management strategies.
- [I] Discuss how potential impacts of temporary and permanent roads on wetland hydrology will be minimized and mitigated.
- [J] Describe mitigation measures to address impacts during all stages of the Project including:
 - a) alteration in flow regimes;
 - b) potential flood events;
 - c) potential water use conflicts; and
 - d) increased sediment and total dissolved solids loadings.

3.5 Aquatic Environment

3.5.1 Baseline Information

- [A] Describe the existing fish and other aquatic resources (e.g., aquatic and benthic invertebrates) for all lakes, rivers, ephemeral water bodies, water courses and other waters potentially affected by the Project including the Red Deer River in the vicinity and downstream of the water intake/pumping station, Berry Creek, Sounding Creek, Shooting Lake and any other connected water bodies that may provide habitat for fish. Identify species composition, distribution, relative abundance, movements and general life history parameters. Also identify any species that are:
 - a) listed as “at Risk, May be at Risk and Sensitive” in The Status of Alberta Species (Alberta Sustainable Resource Development);
 - b) listed in the federal Species at Risk Act; and
 - c) listed by COSEWIC.
- [B] Describe and map, as appropriate, the fish habitat and aquatic resources of the lakes, reservoirs, rivers, ephemeral water bodies and other waters and identify:
 - a) key indicator species and provide the rationale and selection criteria used;
 - b) all areas used by fish, whether seasonally or year-round, for all water bodies and water courses potentially affected by the Project including the Red Deer River in the vicinity of the pumping station, Berry Creek, Sounding Creek, Shooting Lake and any other connected water bodies that may provide habitat for fish, including critical or sensitive areas such as spawning, rearing, and over-wintering habitats;
 - c) seasonal habitat use including migration and spawning routes;
 - d) existing reservoirs including depth map, mean and maximum depths, fluctuations in water levels and current fish habitat and populations;
 - e) water quality parameters in water bodies and water courses that may affect suitability for fish;
 - f) riparian habitat along stream courses with fish populations, as it relates to bank stability, filtration of runoff and cover for fish; and
 - g) current and potential use of the fish resources by aboriginal, sport or commercial fisheries.
- [C] Quantitatively describe the current extent of aquatic habitat fragmentation.

3.5.2 Impact Assessment

- [A] Describe and assess the potential impacts to fish, fish habitat, and other aquatic resources (e.g., instream flow needs, stream alterations and changes to substrate conditions, water quality and quantity) considering:
 - a) fish tainting, survival of eggs and fry, chronic or acute health effects, and increased stress on fish populations from release of contaminants, sedimentation, flow alterations, temperature and habitat changes;
 - b) changes to riparian areas that could affect aquatic biological resources and productivity;
 - c) changes to benthic invertebrate communities that may affect food quality and availability for fish;
 - d) the potential for increased fragmentation of aquatic habitat;
 - e) modifications to natural stream channels including the linear extent, surface area and habitat types affected by such changes and mitigation measures proposed to reduce impacts;
 - f) the change from fluvial to lentic habitat for those areas where reservoirs are proposed for construction;
 - g) changes to flow regimes on stream bed and bank stability;
 - h) erosion and sedimentation due to changes in flow and potential erosion of stream beds and banks; and
 - i) changes to flow regimes on distribution, life cycles, survival and productivity of aquatic life in streams, lakes and reservoirs including consideration of changes from the natural flow regime to a managed flow regime and cessation of flows at the end of the pumping season.
- [B] Discuss the design, construction and operational factors including specific diversion and reservoir operations that will be incorporated into the Project to minimize impacts to fish and fish habitat and protect aquatic resources.
- [C] Discuss the potential impacts of control structures and drop structures on seasonal fish migrations.
- [D] Describe how any water intakes including the main diversion intake and all off-takes from the canal system have been designed to prevent entrainment, impingement or injury of fish and discuss:
 - a) the species and life stages of fish considered;
 - b) the predictions of the likelihood of fish gaining access whether planned or incidental, and predictions of suitability of reservoirs to support fish populations;
 - c) the type of screen, mesh size in relation to species and sizes of fish in the river system that may be susceptible to entrainment, maintenance, repair and cleaning methods of screens during the Project; and
 - d) how the screening system will be monitored for fish entrainment, impingement and injury and identify measures to return entrained fish to river and for impinged or injured fish.
- [E] Identify all aspects of the pumping station that are located in or near water or may affect aquatic habitat and discuss:

- a) the footprint of the pumping station as it relates to the normal high water line, location of the water intake and pipeline from the intake to the plant; and
 - b) methods to be used for all in-water installations of infrastructure.
- [F] Discuss the potential use of screens or other measures to prevent fish from entering areas where survival may be compromised including the multi-use projects, canals and upper reaches of streams or areas where new fish bearing waters have been created that may be subject to dewatering in the fall. Include a discussion on potential management plans that could be implemented to salvage stranded fish.
- [G] Identify plans proposed to offset any loss in the productivity of fish habitat. Indicate how environmental protection plans address applicable provincial and federal policies on fish habitat including the development of a “No Net Loss” fish habitat objective.
- [H] Describe the effects of any surface water withdrawals and water diversions considered including impacts to the Red Deer River, cumulative effects on fish, fish habitat and other aquatic resources.
- [I] Discuss the potential increase in fishing pressures that could arise from the improved access from the Project in the region and how the sport fishery could change based on the diversion and reservoirs.

3.6 Vegetation

3.6.1 Baseline Information

- [A] Describe and map vegetation communities for each ecosite phase. Identify the occurrence, relative abundance and distribution and also identify any species that are:
- a) listed as “at Risk, May be at Risk and Sensitive” in The Status of Alberta Species (Alberta Sustainable Resource Development);
 - b) listed in the federal Species at Risk Act; and
 - c) listed by COSEWIC.
- [B] Describe and map wetlands and riparian communities, including:
- a) a discussion on their distribution and relative abundance;
 - b) a discussion on their location and sizes;
 - c) the wetland type and condition;
 - d) the condition of the upland zone surrounding the wetland or riparian area and list any activity occurring in the upland zone;
 - e) a characterization of the flora and fauna of the wetland or riparian area; and
 - f) an evaluation of the wetland function and ecosystem components that contribute to the integrity of the wetland.
- [C] Describe the regional relevance of landscape units that are identified as rare.

3.6.2 Impact Assessment

- [A] Identify the area of each vegetation community mapped that would be permanently lost due to the project.

- [B] Identify areas that will certainly be temporarily lost to the project and will be reclaimed (e.g. pipeline easement).
- [C] Estimate the temporary vegetation losses or disturbance related to construction impacts.
- [D] Identify any areas that should be avoided during construction if possible.
- [E] Discuss any potential impacts the Project may have on rare plants or endangered species.
- [F] Discuss the regional significance of the permanent vegetation loss.
- [G] For temporary disturbances, discuss from an ecological perspective, the expected timelines for establishment and recovery of vegetative communities and the expected differences in the resulting vegetative community structures.
- [H] Discuss the impact of any loss or development of wetlands and riparian areas, including how the loss or development will affect land use.
- [I] Provide a mitigation strategy that will avoid or minimize Project impacts.
- [J] Discuss weeds and non-native invasive species and describe how these species will be assessed and controlled during construction, reclamation of construction disturbances and project operation.

3.7 Wildlife

3.7.1 Baseline Information

- [A] Describe and map existing wildlife resources (amphibians, reptiles, birds and terrestrial and aquatic mammals) and their use and potential use of habitats.
- [B] Identify key indicator species and discuss the rationale for their selection. Identify composition, distribution, relative abundance, seasonal movements, movement corridors, habitat requirements, key habitat areas (including sandbars and alkaline shorelines on the shores of streams and water bodies, and the native prairie), and general life history. Address those species:
 - a) listed as “at Risk, May be at Risk and Sensitive” in The Status of Alberta Species (Alberta Sustainable Resource Development);
 - b) listed in the federal Species at Risk Act; and
 - c) listed by COSEWIC.
- [C] Describe, quantify and map all existing habitat disturbance.

3.7.2 Impact Assessment

- [A] Describe Project components and activities that may negatively or positively affect wildlife and wildlife habitat.
- [B] Describe and assess the potential impacts of the Project on key indicator species and relate those impacts to wildlife populations and wildlife habitats, addressing:
 - a) how the Project will affect wildlife relative abundance, movement patterns, distribution and recruitment into regional populations for all stages of the Project;

- b) how improved or altered access may affect wildlife including potential obstruction of daily and seasonal movements, increased vehicle-wildlife collisions, and increased hunting pressures;
 - c) how increased habitat fragmentation may affect wildlife considering edge effects, the availability of core habitat, and the influence of linear features and infrastructure on wildlife movements and other population parameters;
 - d) the spatial and temporal changes to habitat availability and habitat effectiveness (types, quality, quantity, diversity and distribution); and
 - e) the resilience and recovery capabilities of wildlife populations and habitats to disturbance.
- [C] Describe the effects on wildlife populations resulting from changes to habitat availability from altered flows/diversions, as well as permanent losses associated with the flooding of the reservoir(s) (including sandbars and alkaline shorelines on the shores of streams and water bodies, and the native prairie).
- [D] 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) a schedule for the return of habitat capability to areas temporarily affected by the Project;
 - c) the use of setbacks to protect riparian habitats and habitats for species at risk, interconnectivity of such habitat and the unimpeded movement by wildlife species using that habitat;
 - d) anticipated access controls or other management strategies to protect wildlife during construction and operation ;
 - e) measures to prevent habituation of wildlife to minimize the potential for human-wildlife encounters and consequent destruction of wildlife; and
 - f) habitat fragmentation and habitat connectivity resulting from linear features (e.g., above ground canals, roads etc.) and other Project infrastructure and activities.
- [E] Identify any opportunities for habitat creation or enhancement which may occur as a result of the Project.

3.8 Terrain and Soils

3.8.1 Baseline Information

- [A] Provide descriptions and maps of the terrain and soil resources, including:
- a) surficial geology and topography;
 - b) soil types and their distribution;
 - c) soils that could be affected by the Project;
 - d) specific locations of erosion sensitive and saline-sodic soils; and
 - e) an inventory of geohazards, such as erosion, landslides, floods etc.

3.8.2 Impact Assessment

- [A] Describe Project activities and other related issues that could affect soil quality (e.g., compaction, contaminants, salinity and sodicity) and:

- a) indicate the amount (ha) of surface disturbance from canal and reservoir construction, infrastructure (e.g., pipelines, power lines, access roads), and other construction and operation activities;
 - b) indicate the size and location of soil types and land capability classes that will be disturbed;
 - c) describe potential sources of soil contamination;
 - d) describe the impact of the Project on soil types and reclamation suitability and the approximate volume of soil materials for reclamation. Discuss any constraints or limitations to achieving vegetation/habitat reclamation based on anticipated soil conditions (e.g., compaction, contaminants, salinity, soil moisture, nutrient depletion, erosion, etc.);
 - e) discuss changes to the potential for soil erosion; and
 - f) discuss potential changes to slope instability and wind erosion and other geohazards.
- [B] Provide a mitigation plan including:
- a) possible measures to minimize surface disturbance;
 - b) possible actions to mitigate effects of any constraint or limitation to habitat reclamation such as compaction, contaminants, salinity, soil moisture, erosion, nutrient regime, etc.;
 - c) possible actions to address impacts to land capability; and
 - d) any other measures to reduce or eliminate the potential impacts that the Project may have on soil capability and/or quality.
 - i) Soil mapping and typical profiles
 - ii) Losses of agricultural soils
 - iii) Erosion issues
 - iv) Characteristics related to handling, reclamation of site disturbances

3.9 Land Use and Management

3.9.1 Baseline Information

- [A] Identify and map the ownership status of the subject lands, including lands owned by the Crown, local municipalities and patented lands.
- [B] Identify and map the current land uses, including oil and gas development, agriculture, forestry, tourism, aboriginal uses and outdoor recreational activities.
- [C] Identify and map unique sites or special features such as Parks and Protected Areas, Heritage Rivers, Historic Sites, Environmentally Significant Areas, culturally significant sites and other designations (World Heritage Sites, Ramsar Sites, Internationally Important Bird Areas, etc).
- [D] Identify any land use policies and resource management initiatives that pertain to the Project, and discuss how the Project will be consistent with the intent of these initiatives.

3.9.2 Impact Assessment

- [A] Identify the potential impact of the Project on land uses, including:
 - a) impacts to unique sites or special features;
 - b) the results of consultation with Parks Canada Agency concerning potential impacts of the Project to the lands, waters, air, and natural and cultural heritage resources of

National Parks, National Historic Sites, National Marine Conservation Areas, Canadian Heritage Rivers, UNESCO World Heritage Sites and Ramsar Convention Wetlands of International Importance. Where impacts are predicted, provide the results of the assessments and clearly identify the impacts to the special protected area;

- c) impacts caused by changes in public access arising from linear development, including secondary effects related to increased hunter, angler and other recreational access, decreased access to traditional use sites and facilitated predator movement;
- d) the implications of relevant land use policies and resource management initiatives for the Project, including any constraints to development;
- e) the anticipated changes (type and extent) to the pre-disturbance topography, elevation and drainage pattern within the Project Area; and
- f) impacts of the Project on public access, regional recreational activities, aboriginal land use and other land uses during and after development activities.

[B] Identify existing private land uses that would be directly affected by the Project and describe the:

- a) area of land affected and the nature of the impact;
- 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 associated damages or disturbances.

[C] Discuss possible mitigation strategies to address:

- a) the need for, and plans to address, access management during and after Project operations;
- b) the process for addressing the needs of other land users in both the Project Area and the Local Study Area; and
- c) Project impacts on land use.

4 HISTORIC RESOURCES

[A] Describe consultation with Alberta Culture and Community Services (ACCS) concerning the need for Historical Resource studies for the Project, and:

- a) provide a general overview of the results of any previous historic resource studies that have been conducted, including archaeological resources, palaeontological resources, historic period sites, and any other historical resources as defined within the Historical Resources Act;
- b) summarize the results from the studies undertaken to assess archaeological, palaeontological and historic significance of both the Project Area and the Local Study Area;
- c) provide a summary of the results of any studies conducted to assess the potential impact of the Project on archaeological, palaeontological and historic resources;
- d) provide an outline of the program that ACCS may require the Proponent to undertake to further assess and mitigate the impacts of the Project on historic resources; and
- e) document any historic resources concerns raised during consultation on the Project.

5 TRADITIONAL ECOLOGICAL KNOWLEDGE AND LAND USE

- [A] If consultation with First Nations reveals traditional uses within project-affected lands, provide a map and description of traditional land use areas if the Aboriginal community or group is willing to have these locations disclosed.
- [B] Determine the impacts of the Project on traditional uses and identify possible mitigation strategies.

6 PUBLIC HEALTH AND SAFETY

6.1 Public Health

- [A] Describe aspects of the Project that may have implications for public health or the delivery of regional health services. Determine quantitatively whether there may be implications for public health arising from the Project.
- [B] Document any health concerns regarding the Project raised by stakeholders during consultation.
- [C] Document any health concerns identified by Aboriginal communities or groups regarding the Project, specifically on their traditional lifestyle. Include an Aboriginal receptor type in the assessment.

6.2 Public Safety

- [A] Describe aspects of the Project that may have implications for public safety.
- [B] Discuss mitigation plans to ensure workforce and public safety for the construction and operation of the Project.

7 SOCIO-ECONOMIC ASSESSMENT

7.1 Baseline Information

- [A] Describe the existing socio-economic conditions in the region and in the communities in the region.
- [B] Describe factors that may affect existing socio-economic conditions including:
 - a) population changes;
 - b) Alberta Transportation's policies and programs regarding the use of regional and Alberta goods and services;
 - c) a project schedule and a general description of the overall engineering and contracting plan for the Project; and
 - d) workforce requirements for Project construction, including a description of when peak construction activity periods will occur.
- [C] Describe the impacts of drought on farm operations in the study area and on the regional and provincial economy including:
 - a) revenue losses (e.g. productivity loss and forced timing of sale of products);
 - b) drought-related costs (e.g. emergency water supply, and trucking of livestock and feed);
 - c) impacts to operations (e.g. forced herd reduction);
 - d) costs related to drought recovery; and
 - e) long term community impacts.

7.2 Impact Assessment

- [A] Describe the socio-economic impacts of construction and operation of the Project, including:
 - a) impacts related to:
 - i) local training, employment and business opportunities,
 - ii) regional and provincial economic benefits, including land-uses that support local economic activities,
 - iii) housing,
 - iv) recreational activities, and
 - v) hunting, fishing, trapping, and gathering; and
 - b) estimated total Project cost as provided in the Engineering Confirmation Study, including a breakdown for engineering and project management, equipment and materials, and labour for both construction and operation stages, including maintenance of the Project and diversion plan.
- [B] Provide an estimate of the costs and benefits of providing cattle watering facilities supported from the project as it relates to improved range management and livestock production.
- [C] Provide an estimate of the wetland losses and gains related to the project and the economic costs and benefits considering Alberta's current wetland policy.
- [D] Provide an estimate of the annual costs and benefits of irrigation farming and its relationship to the farming operation. Estimate the potential effect on farm income from higher crop yields and a more reliable water supply.
- [E] Provide details on the total number of irrigable acres to be serviced by the Project.
- [F] Provide an estimate of the extent to which anticipated farm incomes may generate indirect and induced economic impacts elsewhere in the regional economy.
- [G] Provide an estimate of the nature and cost of the development of recreational infrastructure.
- [H] Provide a summary of all quantifiable benefits and costs of the Project, including the costs of construction, operation and maintenance, increased value of agricultural production, recreational activities and sport fisheries and improved reliability of water supply. Present a sensitivity analysis of assumptions used to generate these values.
- [I] Provide the calculations for the net present value and benefit/cost ratio for the Project and diversion plan.
- [J] Discuss potential local employment or contracting opportunities that may be generated as part of long term operations and maintenance requirements of the Project.
- [K] Discuss the potential for the project to reduce the impacts of drought and how that might factor into the economic assessment of the project having regard for climate change.
- [L] Identify all non-quantifiable benefits and costs expected during the life of the Project. Discuss how these might affect the overall Project benefit/cost analysis.

- [M] Discuss options:
- a) to work with local residents and businesses regarding economic development opportunities arising from the Project; and
 - b) to mitigate socio-economic concerns raised by the local municipality and other stakeholders in the region.

8 MITIGATION MEASURES

- [A] Summarize the environmental protection, mitigation and enhancement measures to be incorporated into the project.

9 RESIDUAL IMPACTS

- [A] Describe the residual impacts of the Project following implementation of the Proponent's mitigation measures and the Proponent's plans to manage those residual impacts.

10 MONITORING

- [A] Describe the Proponent's current and proposed monitoring programs.
- [B] Describe the monitoring programs proposed verify the accuracy of the environmental assessment to assess any Project impacts and to measure the effectiveness of mitigation plans.
- [C] Discuss the Proponent's regional monitoring activities including:
- a) monitoring that will be undertaken to assist in managing environmental effects, confirm performance of mitigation measures and improve environmental protection strategies;
 - b) monitoring done independently by the Proponent and how these monitoring programs are consistent with other current or proposed regional monitoring programs;
 - c) monitoring performed in conjunction with other stakeholders; and
 - d) new monitoring initiatives that may be required as a result of the Project.
- [D] Discuss:
- a) the Proponent's plans for addressing and mitigating any environmental impacts identified in the monitoring program;
 - b) how monitoring data will be disseminated to the public or other interested parties; and
 - c) how the results of monitoring programs and publicly available monitoring information will be integrated with the Proponent's environmental management system.