11.0 CONCLUSIONS

The Kitimat to Summit Lake Pipeline Looping Project (KSL Project) is an initiative of Pacific Trail Pipelines Limited Partnership (PTP) to construct, own, and operate a natural gas pipeline between Kitimat and Summit Lake, north of Prince George, BC. PTP is a corporate partnership between Pacific Northern Gas Ltd. (PNG), and Galveston LNG Inc. (whose project is referred to as the KLNG Project; this project has received approval through the BC Environmental Assessment process).

The KSL Project consists of a looping of the existing PNG pipeline between Kitimat on the west coast of British Columbia and Summit Lake located north of Prince George in British Columbia's central interior. The approximately 462 km long 914 mm (36 inch) diameter pipeline will transport natural gas from the KLNG regasification terminal to be built immediately south of Kitimat, British Columbia to the Spectra Energy Transmission (SET) (formerly Duke Energy) pipeline system at Summit Lake.

The KSL Project crosses a diverse landscape of coastal, mountain, and interior landforms, river systems, and ecosystems. The Project also crosses a number of administrative regions, and First Nations asserted traditional territories, including:

- 11 First Nations traditional territories,
- 1 municipality,
- 3 Regional Districts,
- 5 Land and Resource Management Plan (LRMP) areas,
- 4 Forest Districts, and
- 2 Ministry of Environment Regions.

Environmental effects were assessed at three scales, including the Project Footprint, namely the land area directly affected by the Project and its facilities, the Local Study Area (LSA), which includes a 2 km buffer centered on the Project Footprint, and a Regional Study Area (RSA).

Comprehensive public consultation and First Nations consultation programs were initiated early in the Project planning process. The goals of the consultation programs included:

- identifying all potential interested parties as early as possible, and provide opportunities for engagement at levels appropriate to their interests;
- providing an opportunity for potentially affected parties to become informed about the Project at the earliest possible Project development phase;
- initiating consultation and engagement activities early to enable stakeholder input to be considered in project design and routing decisions;
- identifying potential issues associated with the Project;

- providing for an open and accountable review process that considers First Nations and, local, regional and provincial interests;
- providing various communication channels to make information available to stakeholders and First Nations peoples; and
- notifying all potential stakeholders about the Project and their opportunity to participate in a manner appropriate to their needs.

General and site-specific mitigation measures have been identified during the consultation processes, and the various technical studies conducted in 2006 and 2007. Mitigation measures for the Project area are based on current industry accepted standards, consultation with government agencies and interested groups and individuals, and the professional judgement of the assessment team. The proposed mitigation measures will form the basis of the Environmental Protection Plan (EPP) for the Project that will be developed prior to clearing and construction. The EPP will outline the detailed protection measures to be undertaken by PTP and their contractors during each activity of pipeline or facility construction. In addition to the EPP, a number of issue-specific management plans will be developed prior to ground-disturbing activities.

The implementation of proposed mitigation measures will minimize the potential environmental and socio-economic effects associated with the construction and operation of the Project. Standard pipeline operating procedures will be implemented following the completion of the construction and restoration work.

The following sections outline conclusions reached by the effects assessment.

11.1 GEOPHYSICAL ENVIRONMENT

A variety of potential effects of the KSL Project on the Geophysical Environment were identified. Most potential effects could be mitigated, but the following residual effects were identified after the application of mitigation measures:

- The alteration of local topography and minor, localized instabilities that may occur in fill material.
- Areas of minor terrain instability may occur.
- Minor mixing of topsoil or root zone material with subsoil will likely occur.
- Loss of topsoil or root zone material through wind and water erosion.
- Minor trench subsidence or a crown may remain over the ditch line.

These residual effects on the geophysical environment were assessed to be less than significant.

11.2 ATMOSPHERIC ENVIRONMENT

The KSL Project was found to have the potential to affect the Atmospheric Environment though greenhouse gas emissions, emissions from construction equipment, generation of dust from construction traffic and blasting, and smoke from slash-burning. Most potential effects will be mitigated, but the following atmospheric environment residual effects may occur, and were assessed:

- Short-term increase in construction equipment emissions.
- Short-term increase in dust arising from construction traffic.
- Fugitive greenhouse gas emissions from pipeline operations.
- Greenhouse gas emissions from Compressor Station operations.
- Emissions of common air contaminants and Schedule 1 substances from Compressor Station operations.

These residual effects were assessed to have a less than significant effect on the Atmospheric Environment.

11.3 AQUATIC ENVIRONMENT

The potential effects on 16 species of fish and their habitats were addressed. Potential effects included the direct and indirect mortality of fish, the loss or degradation of instream fish habitat, the loss or degradation of riparian habitat, the loss or degradation of habitat connectivity, and the interbasin transfer of aquatic organisms. After mitigation, the following residual effects are anticipated:

- Fish mortalities from instream construction activities.
- Physical alteration of instream habitat at crossing sites and through sediment release.
- Loss of food inputs from riparian areas at vehicle and pipeline crossings.

Residual effects of the KSL Project on the Aquatic Environment were assessed to be less than significant, following the application of compensation in some circumstances.

11.4 TERRESTRIAL ENVIRONMENT; WILDLIFE AND WILDLIFE HABITAT; VEGETATION

Potential effects of the KSL Project on wetlands, terrestrial vegetation, forest health, invasive plant species, and wildlife and wildlife habitat were identified. The wetland investigation addressed project-related effects on wetland hydrology and water quality. The vegetation assessment focussed on the alteration or degradation of numerous sensitive or rare vegetated habitats in the study area. The context of the construction of the KSL Project in the heart of the Mountain Pine Beetle

infestation was considered, along with other forest pathogens in the study area. The assessment also addressed the introduction or acceleration of non-native, invasive plant species that may result from Project activities. The Wildlife and Wildlife Habitat section focussed on the alteration or degradation of habitat, direct and indirect wildlife mortality, and sensory disturbances to wildlife that may occur as a result of the Project. Many of the potential effects will be mitigated, but the following residual effects are expected:

- Approximately 945 ha of wetland, forested, grassland, and high elevation wildlife habitat will be disturbed.
- Introduction or spread of invasive species as a result of construction and pipeline operations and maintenance.
- Approximately 18 ha of mountain goat winter range will be crossed by the pipeline route.
- Suitability of 52 streams used by coastal tailed frogs will be altered.
- Seasonal movement patterns of wide ranging predators (e.g. grizzly bear, grey wolf, lynx, cougar, wolverine) will be altered during construction.
- Incidental construction-related mortality of individual coastal tailed frogs and other wildlife with small, restricted ranges will occur.
- The risk of wildlife vehicle collisions will increase during construction.
- Increased authorized and unauthorized hunting during and post-construction may occur.
- Maintenance of vegetation at an early seral stage along travel corridors on the pipeline right-of-way.

The residual effects were assessed, and their effect on the Terrestrial Environment was found to be less than significant.

11.5 SPECIES AND ECOSYSTEMS AT RISK

The potential effects of the KSL Project on Species and Ecosystems at Risk were identified for fish species at risk, rare plant communities, and wildlife species at risk. All fish, wildlife, and plant communities in the project area were considered if they are listed federally by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or the *Species at Risk Act* (*SARA*) as special concern, threatened, or endangered, or are provincially blue- or red-listed. In total, the combined effects of the KSL Project on six fish species at risk, four rare plant communities, and ten wildlife species at risk are considered in the assessment. Many of the potential effects can be mitigated, but the following potential residual effects were identified:

- Approximately 17 ha of forest and grassland plant communities at risk will be cleared.

- Construction phase disturbance to grizzly bears at feeding, reproductive sites, and movement corridors.
- Increased unauthorized hunting of grizzly bears during and post-construction in previously unroaded mountainous areas.
- Approximately 40 ha of high suitability coastal northern goshawk habitat will be cleared.
- Approximately 1 ha of suitable marbled murrelet nesting habitat will be cleared.
- Incidental mortality of individual coastal tailed frogs at all life stages.
- Diminish instream and adjacent habitat suitability of 52 streams used by coastal tailed frogs.

Residual effects of the KSL Project on Species and Ecosystems at Risk were assessed to be less than significant.

11.6 ARCHAEOLOGICAL AND HERITAGE RESOURCES

The Archaeological Impact Assessment (AIA) for the KSL Project examined a total of 81 archaeological survey units comprised of 32 polygons rated as high archaeological potential and 49 polygons rated as medium archaeological potential. Survey transects coupled with exploratory subsurface testing resulted in the identification of the following sites within the Project Footprint:

- 3 previously recorded archaeological sites,
- 3 previously recorded Culturally Modified Tree (CMT) sites,
- 2 newly discovered archaeological sites (lithic scatters),
- 6 newly discovered CMT sites, and
- 2 newly discovered historic sites (old cabin and trap box).

Potential effects of the KSL Project on these sites will be mitigated by a combination of impact avoidance as well as systematic data recovery through controlled excavation and/or surface collection and stem round sampling on identified CMTs, prior to ground disturbing activities.

Residual effects of the KSL Project on Archaeological and Heritage Resources were assessed to be less than significant.

11.7 FIRST NATIONS COMMUNITY AND LAND USE

Potential conflicts of the KSL Project with First Nation Land Use Plans, forest licensee operational plans, trapping operations, hunting, seasonal harvesting activities, plant material gathering, and fishing were identified. Many of the potential effects of the Project on the First Nation Communities can be mitigated, but the following residual effects may occur:

- Construction phase disruption of First Nation commercial trapping operations.
- Construction phase disruption of First Nation traditional use activities.
- Alteration of degradation of First Nation plant and material gathering sites.
- Physical alteration of instream habitat at water crossing sites and through sediment release.
- Maintenance of vegetation at an early seral stage along travel corridors on the pipeline right-of-way.
- Introduction or spread of invasive species as a result of construction, operations and maintenance activities.

Residual effects of the KSL Project on First Nations Community and Land Use were assessed to be less than significant.

11.8 LAND AND RESOURCE USE

Potential conflicts between the KSL Project and Land and Resource Use Plans (LRMP) and current uses of the land and resources, as well as potential effects on domestic water supply and quality and contaminated sites were identified. Conflicts with specific management policies, planned industrial activities, designated management areas or operational plans were identified, and can by largely mitigated. Many of the potential effects of the KSL Project on land and resource use can be mitigated, but the following residual effects may occur:

- Increased potential for unauthorized motorized use of the proposed Burnie-Shea protected area and Herd Dome Area Specific Management Zone.
- Reduction in commercial timber producing capacity on the Project ROW.
- Construction phase traffic effects on FSRs and forestry operations.
- Construction phase disruption of commercial fish, wildlife, and nature-based operations (e.g., guide-outfitting).
- Construction phase disruption of public recreation use.
- Use of the pipeline ROW as a public travel corridor.

The residual effects of the KSL Project on Land and Resource Use were assessed to be less than significant.

11.9 COMMUNITY AND REGIONAL INFRASTRUCTURE AND SERVICES

The scale of construction and workforce associated with the KSL Project has potential effects on the infrastructure of the communities and regional centers in the project area. The increased demand on community utilities, services, and accommodations, increases in traffic volumes, and temporary

disruptions of existing utilities were estimated for the project. Though many of the potential effects can be mitigated, the following residual effects may occur:

- Construction phase increase in economic activity and business for local suppliers.
- Construction phase increase in local community population and use levels at recreational facilities and other community facilities.
- Construction phase increase in traffic on highways and paved roads.

The residual effects of the KSL Project on Community Infrastructure and Services were assessed to be less than significant.

11.10 EMPLOYMENT AND ECONOMY

The potential effects of the KSL Project on the local and regional economy and on jobs and the labour force were identified. The project is expected to cause an increase in employment and regional economic opportunity. As such, the following beneficial residual effects have been identified:

- Construction phase increase in local and regional business activity.
- Construction phase increase in local employment.
- Long-term purchase of goods and services from local communities.
- Annual taxes and fees paid to municipal, regional, provincial, and federal governments.

The residual effects were assessed, and no significant residual adverse effects were identified. The affects were assessed as being beneficial.

11.11 HUMAN HEALTH AND SAFETY

The potential effects of the KSL Project on air quality, water quality, noise, and human safety were identified. Many of the potential effects can be effectively mitigated, but the following residual effects were identified:

- Air emissions and increased noise levels during the clearing, construction, and restoration can be expected.
- Brief, low level increases in domestic water turbidity associated with the installation and removal of dams, flumes, and pumps near surface water points of diversion.
- Potential disruption of water well flows and quality during construction phase.

The residual effects were assessed to be less than significant.

11.12 NAVIGABLE WATERS

PTP will adhere to all of the conditions that are part of the approval under the *Navigable Waters Protection Act* (*NWPA*). The navigability of some watercourses along the pipeline route may be affected during construction. However, with advance public notification regarding the affected watercourse through the placement of ads in local papers and on the radio, along with installation of signs at boat launches and measures to be implemented during instream construction, any residual effect on the recreational use of navigable waters is immediately reversible and of low magnitude. Accordingly, there are no significant adverse effects resulting from the Project.

11.13 AESTHETICS AND VIEWSHEDS

The construction of the KSL Project will involve clearing a linear corridor that will be visible from certain recreational areas, trails and rivers. Mitigation measures will minimize this effect, however, the following residual effects are expected:

- Viewscape from recreational sites will be altered.
- Viewscape from hiking trails will be altered.
- Viewscapes in the Burnie River Valley and Morice River Valley will be altered.

These residual effects were assessed to be less than significant.

11.14 CUMULATIVE EFFECTS

Project-related effects and the mitigation measures used to minimize the effects in the Project Footprint and LSA may be noticeable at a regional level. These regional effects are considered in the Cumulative Effects Assessment.

The KSL Project will make a small contribution to regional cumulative effects risk on Wildlife and Wildlife Habitat during the construction and operations phases. With implementation of identified mitigation measures, the Project will not cause significant adverse cumulative effects on wildlife movement.

Combined effects on aquatic habitat will be mitigated by appropriate crossing methodologies and a habitat compensation program to be developed with Fisheries and Oceans Canada (DFO) and BC Ministry of Environment (BC MOE). With the implementation of identified mitigation measures, incremental effects of aquatic and riparian habitat alteration are reversible in the medium- to long-term and of low magnitude at the regional scale. Cumulative effects on aquatic and riparian habitat will be less than significant.

The KSL Project could have medium-term effects on First Nations traditional use in the vicinity of the pipeline route during the active construction period. With implementation of identified mitigation measures and routing considerations, incremental effects of KSL pipeline construction and

operations will be reversible in the medium-term and of low magnitude at the regional scale. Cumulative effects on traditional use will be less than significant.

Detectable effects on regional socio-economic indicators such as employment would be confined to the KSL Project construction phase; these positive effects would increase if other proposed pipelines are constructed simultaneously. The KSL Project may contribute to employment diversification in the RSA, however it is acknowledged that a large proportion of the skilled labour would be from outside the region. Incremental effects on employment are reversible in the medium-term and of low magnitude at the regional scale.

Wilderness values would be adversely affected by Project construction in the proposed Burnie – Shea Lakes protected area. Mitigation measures consistent with the management goals of the proposed protected area will be adopted to minimize the extent and duration of adverse effects.

11.15 CONCLUSIONS OF THE ASSESSMENT

The KSL Project has been assessed using the scope defined in the BC EAO Section 11 Order, and the May 18, 2007 Approved Terms of Reference for the Project. Based on the analyses provided in this Application, it is concluded that the KSL Project will:

- result in no significant adverse residual environmental, social, economic, health or heritage effects;
- be consistent with the principles of existing land and resource management plans;
- reflect sustainable development; and
- result in no adverse effects on First Nations traditional use, aboriginal interests, or treaty rights.