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4 ENVIRONMENTAL AND SOCIO-ECONOMIC ASSESSMENT

BACKGROUND

The terrestrial and human environment

In seeking to understand and address the project's potential effects on the terrestrial and human environment, Northern Gateway considered feedback from its consultation process to determine what the environmental and social-economic assessment (ESA) should address.

For the pipelines, associated facilities and the tank terminal, 17 topics (as listed on the left) were assessed, and the information gathered to date is presented here in chart form. As additional topics are identified during the ongoing environmental review and Aboriginal and stakeholder engagement processes, they will be addressed in the supplemental filing.

For the routine activities associated with the project, each chart covers the following:

- Geographic and time boundaries set for the assessment
- Physical works and activities considered in the study (Note: see Figure 3.1 in *section 3, Project description*)
- Study methods used in the assessment
- Values and resources identified as being of greatest importance to regulators, Aboriginal people and stakeholders. These values and resources are referred to as valued environmental components (VECs)
- Key issues related to the project that were identified through consultation with regulators, Aboriginal people and stakeholders
- Key indicator resources (KIRs) – species, groups of species, resources or ecosystem functions that represent components of the broader valued environmental components
- Baseline results determined from past scientific studies and surveys, Aboriginal traditional knowledge and field studies conducted specifically for the project
- Measurable parameters that were selected to provide a way of determining or measuring the level or amount of change to a VEC or KIR
- Potential project effects on the VECs – how routine activities and actions for the project might potentially result in an environmental effect
- Proposed mitigation – means to ensure that environmental effects to the valued environmental component are reduced as much as possible
- Residual effects – the remaining environmental effects after all mitigation and environmental management measures have been applied
- Cumulative effects –the potential for project effects to act together with similar environmental effects from other past, present and reasonably foreseeable projects and human activities are assessed after the residual project effects have been described and assessed

Please note that the assessment of spill prevention and response is discussed in *section 3, Project description*.

ENVIRONMENTAL AND SOCIO-ECONOMIC ASSESSMENT

Valued environmental components: The criteria for selecting VECs include:

- Were they identified in the draft terms of reference for the Joint Panel Review?
- Do they represent a broad environmental, ecological or human environment component that may be affected by the project?
- Are they vulnerable to the environmental effects of the project and other activities in the region?
- Have they been identified as important issues or concerns by regulators, Aboriginal people or stakeholders or in other assessments in the region?

VECs for the terrestrial environment include aspects such as air quality, sediment and water quality, freshwater fish, vegetation, birds and mammals and prehistoric artifacts that might be altered by the project. They are widely recognized as important for ecological reasons.

Representative VECs for the human environment include aspects such as the economy, employment and business, traditional land and resource use, non-traditional land use, and communities and community life.

Geographic and time boundaries: Three geographic study areas have been used for the environmental assessment for the pipelines and tank terminal. They are:

- The project development area (PDA) that will be directly affected by the actual footprint of the pipeline associated facilities, and the tank terminal.

  For the purpose of the environmental assessment, the PDA included a 50 m wide right-of-way, the pump stations sites, the powerline right-of-ways, and the 220 ha tank terminal site. The alignment for new temporary and permanent roads has not yet been finalized so these features are not yet included in the PDA.
- The project effects assessment area (PEAA) over which the direct and indirect environmental effects of the project can be measured or are expected to occur. A one kilometre wide area centred on the pipeline centerline was used as the PEAA by most disciplines. For the tank terminal, the PEAA usually included the tank terminal site plus a 500 m wide buffer around the site.
- The regional effect assessment area (REAA) is the area where effects of the project are likely to interact with similar effects from other human activities and projects. The REAA differs among VECs and even among different effects for a VEC. In general, the REAA included a 30 km wide area centred on the pipeline RoW.

Time or temporal boundaries are based on when an effect could most likely occur during the project, such as the three phases of the project: construction, operations and decommissioning.

The environmental assessment equation

Finally, the following equation explains how all the components of the assessment relate to one another. The equation is the sum of our **baseline knowledge of environmental factors**, and our **assessment of a project's potential effects**, minus the **effects of mitigation and protection measures**. This set of knowledge is equal to the other side of the equation – namely the **project's residual effects** combined with the **cumulative effects of other activities on the environment**.