VEGETATION

Study geographic boundaries: PDA, REAA.

Study time boundaries: Construction, operations, and decommissioning phases.

Project works and activities considered in the study*: Construction – Right-of-Way (RoW) and facility site clearing; grading; ditching; backfilling; reclamation. Operations – air emissions at the terminal site. Decommissioning –removal of all above-ground structures; re-contouring surfaces to stable conditions; and reclamation.

Study methods: Ecosite phases (Alberta) and site series (British Columbia) describe a vegetation classification. They provide the basic ecological units that define ecosystem processes of growth, productivity and composition of plant communities, plant species and rare plants.

Old forests are defined by a set of characteristics in the later stages of succession, including structural diversity, which creates habitat for unique plant and animal communities. Old forests typically have high species richness, which contributes to forest biodiversity. Age-based definitions of old forest differ among stand types because different tree species mature and decline.

A rare plant is defined as any native plant that exists in low numbers or in very restricted areas. Rare plant communities are defined as natural communities that are unusual, uncommon, of limited extent, encountered infrequently, in decline, or threatened. Rare plants are particularly vulnerable to disturbance because of their limited extent. The existence of a rare plant and rare plant community contributes to species diversity locally and regionally.

Wetlands are defined as land that has the water table at, near or above the land surface, or which is saturated for a long enough period to promote wetland or aquatic processes. There are four wetland classes used in this assessment: bog, fen, swamp and marsh. Wetlands vegetation communities are typically of limited distribution and consist of unique vegetation. They may contain rare species of limited range and adaptability.

Merchantable timber is a major resource in Alberta and British Columbia.

Non-native weed species are plants that are not indigenous to a given place but have been accidentally transported to a location, usually by human activity. Some non-native species can become invasive, resulting in a disruption of the natural system through changes in nutrient cycling, wildlife composition, or fire regime. Invasive plants can interfere with a native vegetation community's resiliency and adaptation to natural disturbance and climatic variation.

Beginning near Bruderheim, the pipeline corridor passes through six physiographic regions: the Eastern Alberta Plains, the Southern Alberta Uplands, the Alberta Plateau, the Rocky Mountains, the Interior Plateau and the Coast Mountains. Each physiographic region is further subdivided into natural regions and subregions in Alberta, and biogeoclimatic zones and variants in British Columbia based on various combinations of soils, climate, vegetation and site conditions.

VEC	Key Issues	KIR	Baseline Results	Measurable Parameter	Potential Project Effects**	Proposed Mitigation	Residual Effects	Cumulative Effects
Vegetation Diversity	Loss of vegetation Effects of surface or shallow groundwater flow disruption Introduction of non-native species Effects of air emissions		Ecosystem units were mapped to the vegetation community level for the entire PEAA using Ecological Land Classification (ELC) in Alberta and Terrestrial Ecosystem Mapping (TEM) in British Columbia. A 1:20,000-scale map of the PEAA has been produced, in which each polygon is typed with ecosite phase (in Alberta) or site series (in British Columbia), structural stage and, in British Columbia only, site modifiers.	Ecosite phases (Alberta) / Site series (British Columbia)	The primary effect on vegetation diversity will be surface disturbance by the RoW and associated infrastructure. Overall, due to the small area of disturbance along the pipeline route, the effect on vegetation types is minimal because of the small area to be cleared and expected to be minor and manageable. Annual average ground level concentrations of sulphur dioxide from the project are predicted to exceed guidelines for sensitive lichen species in a small area near Kitimat terminal. Given the small area that will be affected, no significant effect on lichen species are expected.	Currently being assessed.	Currently being assessed.	Currently being assessed.
			There are over 3,500 ha of old forest in the portion of the RoW that crosses the Southern Alberta Uplands, primarily in the Boreal Mixedwood Natural Subregion. Smaller areas of old forest (i.e., less than 175 ha) occur in the eastern portion of the Alberta Plateau, and along the Missinka River valley in the Rocky Mountains portion of the RoW. There are 400 ha of old forest scattered along the route in the Interior Plateau. Within the Coast Mountains physiographic region of the RoW, there are 1,200 ha of old forest, most of which is concentrated in the upper Kitimat River valley.	Old forests	Old forest stands are widely distributed and there will be limited clearing of this vegetation type.	Currently being assessed.	Currently being assessed.	Currently being assessed.

*Refer to Figure 3.1 in *section 3, Project description*, for the full list of physical works and activities. **The effects of spills and malfunctions will be included in the update for the supplemental filing.

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VEC	Key Issues	KIR	Baseline Results	Measurable Parameter	Potential Project Effects**	Proposed Mitigation	Residual Effects	Cumulative Effects
			Several rare plant species and rare plant communities have been noted within the RoW. Additional field surveys to determine if rare plants and rare plant communities occur will be undertaken in the summer prior to construction and appropriate mitigation measures will be developed.	Rare plants	Rare plants and rare plant communities will be minimally affected by the project.	Mitigation will be applied, if necessary, to reduce any effects of clearing on the rare plants and rare plant communities.	Currently being assessed.	Currently being assessed.
			The 2,400 wetlands recorded in the pipeline corridor are divided among swamp, fen and bog wetland types. The Southern Alberta Uplands have the largest total area of wetlands with 3,500 ha of fens followed by swamps. The Interior Plateau has 1,300 ha, while the Eastern Alberta Plains, the Alberta Plateau, and the Rocky Mountains all have less than 700 ha, primarily swamps and bogs. The Coast Mountains physiographic region has the smallest area of wetlands with less than 150 ha of swamp and fen in the lower Kitimat River valley.	Wetlands	Currently being assessed.	The effects of surface disturbance to wetlands and disruption of surface or shallow groundwater flow patterns associated with wetlands will be reduced by designing and following mitigation measures appropriate for the types of wetlands identified along the pipeline route.	Currently being assessed.	Currently being assessed.
			There are 500, 000 m3 of merchantable timber in the RoW. Alberta has one third of this timber, consisting mainly of deciduous volume, while British Columbia has two thirds consisting of coniferous volume.	Merchantable timber	The project is located mainly on forested lands and will result in clearing of timber. The volume and location of merchantable timber to be removed will be determined. This will be based on the utilization standards in each province.	Merchantable timber will be harvested prior to construction.	Currently being assessed.	Currently being assessed.
			Several weedy species were observed in the agricultural areas, as well as next to highways and some industrial clearings along the RoW. Several of these species are classified as noxious weeds.	Non-native weed species	Currently being assessed.	Introduction and spread of non-native weed species on vegetation diversity will be managed using various mitigation measures appropriate for individual weed species.	Currently being assessed.	Currently being assessed.