SITE C CLEAN ENERGY PROJECT

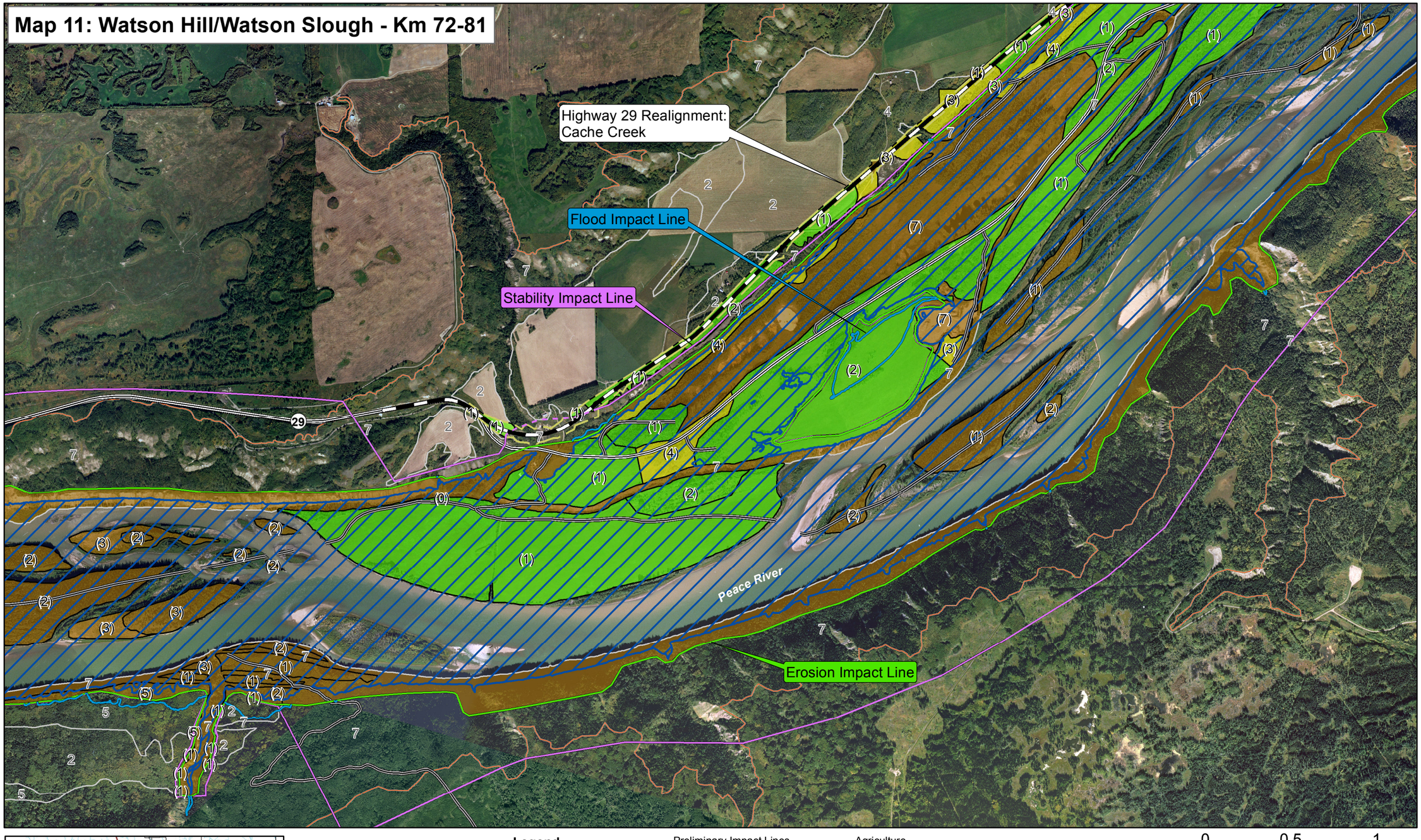
Map 11 of 26 – Watson Hill/Watson Slough

Preliminary Impact Lines, Highway 29 Realignments and Agriculture Assessment
March 2013

Kilometre	Current Conditions	Reservoir Conditions and Preliminary Impact Lines Related to the Proposed Site C Reservoir
72-81	**Location** This map sheet covers from approximately river kilometre 72 to 81 (measured downstream from the W.A.C. Bennett Dam). It is located between Halfway River and Cache Creek. **Geology and Topography** Between river kilometre 72 and 74.5 the north bank is a high slope that extends to the top of the valley. This high slope comprises silty shale bedrock and sand and gravel near the bottom, and weaker interbedded sand, silt and clay near the top. It has been subject to large landslides that predominantly originated in the weak soils near the top of the valley. Highway 29 traverses the crest of the slope. It descends this slope at an area referred to as Watson Hill. Between approximately river kilometre 74.5 and 81 the north bank general comprises wide, low-lying sand and gravel terraces. The slopes along the south bank extend to the top of the valley and comprise colluvium, interbedded sand, silt and clay, and layers of sand and gravel that overlies silty shale bedrock. There is evidence that large landslides have occurred on these higher slopes in the past. **Highway 29 and Other Infrastructure** Between approximately river kilometre 75 and 81, Highway 29 is currently located on a low-lying terrace that would be inundated by the proposed reservoir.	**Proposed Reservoir** Within this map sheet, the proposed Site C reservoir would have a width ranging from about 1,100 metres to 2,000 metres. Based on the river surface elevation at the time of topographic survey, the reservoir would cause an increase in water depth over river conditions ranging from about 35 metres at the upstream end to about 40 metres at the downstream end. **Preliminary Impact Lines** Most of the proposed reservoir shoreline comprises steep slopes and the reservoir shoreline and the **flood impact line** would be located close together in aerial-view when the reservoir is first filled. Between approximately river kilometre 72 and 74.5, the north bank of the proposed reservoir would be in contact with a high bank slope. Highway 29 runs along the crest of this slope at the top of the valley. Because of the shoreline geology, the reservoir is not expected to have an impact on slope stability, however, as a precautionary measure, the **stability impact line** encompasses lands at the top of this slope to highlight the ongoing natural potential for landslides. Groundwater and stability conditions will be monitored during reservoir operation if the project proceeds to confirm that the reservoir does not negatively impact slope stability. Between approximately river kilometre 74.5 and 81, the proposed north bank reservoir shoreline would run along the base of a 25 metre high sand and gravel terrace slope. Along this section the **erosion impact line** is typically located near the crest of the slope while the **stability impact line** is typically located within 15 metres of the crest of the slope. **Highway 29 Preferred Realignment – Bear Flat/Cache Creek** Highway 29 is currently located on a low-lying terrace that would be inundated by the proposed reservoir, and would be realigned between river kilometre 75 and 81.
	Agriculture Assessment Improved (irrigated and/or drained) agricultural land capability ratings are provided for the Site C project component areas where additional soil survey work has been undertaken as part of the Agriculture Assessment. For remaining lands outside the Site C project component areas, including the Peace River valley downstream of the Site C dam, unimproved agricultural land capability ratings are provided. The unimproved ratings reflect published agricultural capability maps from the 1970s, based on an assumed low climatic moisture deficit (CMD) during the growing season in the range of 34 mm. However, subsequent climate studies have confirmed much drier conditions in the Peace River valley, with a CMD in the range of 148 mm, which results in a Class 3 unimproved climatic capability rating. With irrigation, it is likely that Peace River valley soils downstream of the Site C dam historically rated as Class 2 or Class 3 with aridity or soil water holding capacity limitations, which would now be rated as unimproved Class 3 due to climatic limitations, would improve to Class 2 or Class 1 with irrigation.	***Land Use Within Preliminary Impact Lines*** *BC Hydro has developed an approach to land use on private property within the impact lines. The approach focuses on public safety, maximizing flexibility for land owners, and minimizing the amount of land required by the project. BC Hydro's approach would be as follows:* • *BC Hydro would purchase land between the current river shoreline and the area required for the proposed reservoir, up to the Maximum Normal Reservoir Level (461.8 metres above sea level)* • *No new residential structures would be permitted within impact lines* • *Non-residential structures could remain, pending site specific geotechnical assessment* • *Within the Stability Impact Line, existing residential structures could remain for a period of time, at the owner's request and provided a site-specific geotechnical assessment determines that it is safe to do so* • *Within the Flood, Erosion or Landslide-Generated Wave Impact Line, existing residential structures would not be permitted to remain, to protect public safety* • *Other activities such as agriculture, grazing and trapping could continue within the impact lines* *The establishment of reservoir impact lines is intended to ensure public safety while maximizing land use flexibility, and to minimize the amount of land required by the project. BC Hydro will purchase the property rights required for the impact lines. Where impacts and implications on zoning, land use and property acquisition cannot be avoided, BC Hydro will identify and evaluate options for mitigation.* *BC Hydro is meeting directly with property owners whose land may be impacted to discuss their specific property interests.*
	Peace River Valley Definition BC Hydro defined the Peace River Valley as a spatial area, reflecting the Peace River mainstem from the Peace Canyon Dam to the B.C.-Alberta border. The upper edge of the Peace River Valley is defined as the crest of the top of high bank slopes, typically between El. 620 and 850m. The purpose of spatially defining the valley was to provide a consistent area for use where relevant in the Environmental Impact Statement.	

Map Follows on Next Page
These maps are best viewed printed on 11"x17" paper

Map 11: Watson Hill/Watson Slough - Km 72-81



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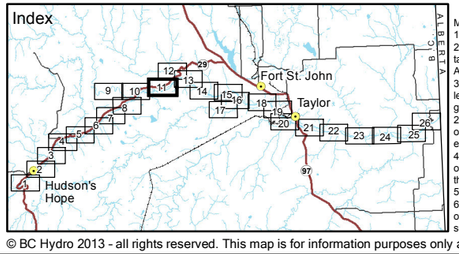

Map Notes:
1. Datum/Projection: NAD83/UTM Zone 10N.
2. Orthophotos created from 1:40,000 scale photography taken Sept 2007; 1:15,000 scale photography taken Aug 2011; TRIM; Bing Maps Aerial 2012.
3. Proposed maximum normal reservoir level (full supply level-461.8m) from Digital Elevation Models (DEM) generated from LiDAR data acquired July/August, 2006. The surface area of the reservoir will change over time after reservoir filling as a result of shoreline erosion and deposition of sediment.
4. Preliminary flood impact line is based on an elevation of 466 m and is only shown when located outside of the preliminary erosion impact line.
5. Exact extent of Hudson's Hope Berm yet to be determined.
6. The amount of water level fluctuation downstream of the proposed dam will be dependent on factors such as the flow volume, depth, width and slope of the river.

Legend

- Proposed Reservoir
- Peace River Valley Definition
- Highway 29
- Access Routes
- Preferred Highway Realignment
- Preferred Highway Realignment Right-Of-Way

Preliminary Impact Lines
- Preliminary Flood Impact Line
- Preliminary Erosion Impact Line
- Preliminary Stability Impact Line
- Preliminary Stability Impact Line - Subject to final highway design

Agriculture
Agriculture Utility Class
- High
- Moderate
- Low

Agriculturally Improved Capability Class (eg. with irrigation)
- (1) Capability Class 1-7 (Dominant)

Unimproved Capability Class
- 1 Capability Class 1-7 (Dominant)

0 0.5 1 km

SITE C CLEAN ENERGY PROJECT

BC hydro

Preliminary Impact Lines, Highway 29 Realignments & Agriculture Assessment

Date	March 2013	DWG NO	1016-C14-B6192	R 1

The Site C Clean Energy Project requires environmental certification and other regulatory permits and approvals before it can proceed to construction. The information presented in these maps reflects current planning for the Site C Clean Energy Project and is subject to change as the project continues to be further defined.