Map 13 of 26 – Cache Creek Slide

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
81-88	**Location** This map sheet covers from approximately river kilometre 81 to 88 (measured downstream from the W.A.C. Bennett Dam). The pre-historic Cache Creek Slide is located along the north bank near river kilometre 84. **Geology and Topography** The north bank of Peace River generally comprises moderately steep to steep high bank slopes in shale bedrock. The slopes lower in the valley tend to be flatter and are covered by a layer of bedrock colluvium (landslide debris). The upper slopes on the north bank are capped by sandstone bedrock. Large, bedrock landslides have originated from the upper high bank slopes in the past, the largest being the Cache Creek Slide. The south bank generally comprises sand and gravel terraces. **Highway 29 and Other Infrastructure** Highway 29 climbs Cache Creek Hill at the upstream end of the map sheet and east of this is located far from the crest of the valley slopes.	**Proposed Reservoir** Within this map sheet, the proposed Site C reservoir would have a width ranging from about 700 metres to 1,300 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 40 metres at the upstream end to about 43 metres at the downstream end. **Preliminary Impact Lines** The lower slopes along the north side of Peace River are fairly gentle. Consequently the **flood impact line** extends several metres inland from the proposed reservoir shoreline. On rare occasions, flooding of these low-lying areas could occur due to wind generated waves combined with high reservoir levels, or from small landslide-generated waves. The **erosion impact line** through this section is typically located within 40 metres of the proposed reservoir shoreline. The **stability impact line** is located beyond the crest of the valley slopes and encompasses the headscarps of the large bedrock landslides. The results of geotechnical investigations indicate that flooding of the proposed reservoir would likely not impact the stability of these slopes. If project proceeds, groundwater and stability conditions will be monitored during reservoir operation to confirm that the reservoir does not negatively impact slope stability. **Highway 29 Preferred Realignment – Bear Flat/Cache Creek** Realignment of Highway 29 is required through this section. A preferred corridor for a new bridge crossing at Cache Creek has been identified, and the final road alignment will be determined based on the results of additional geotechnical investigation.
	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 13: Cache Creek Slide - Km 81-88

N

Highway 29 Realignment: Cache Creek

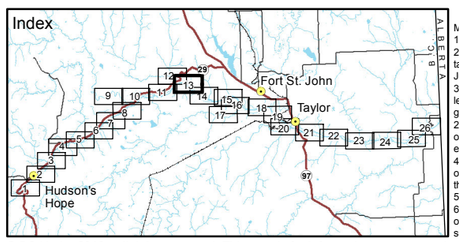
Flood Impact Line

Stability Impact Line

Erosion Impact Line

Cache Creek

Peace River



Map Notes:
1. Datum/Projection: NAD83/UTM Zone 10N.
2. Orthophotos created from 1:40,000 scale photography taken Sept, 2007; 1:20,000 scale photography taken June, 2007; 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 Corridor

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