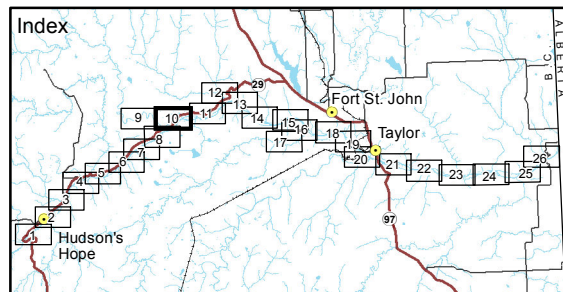
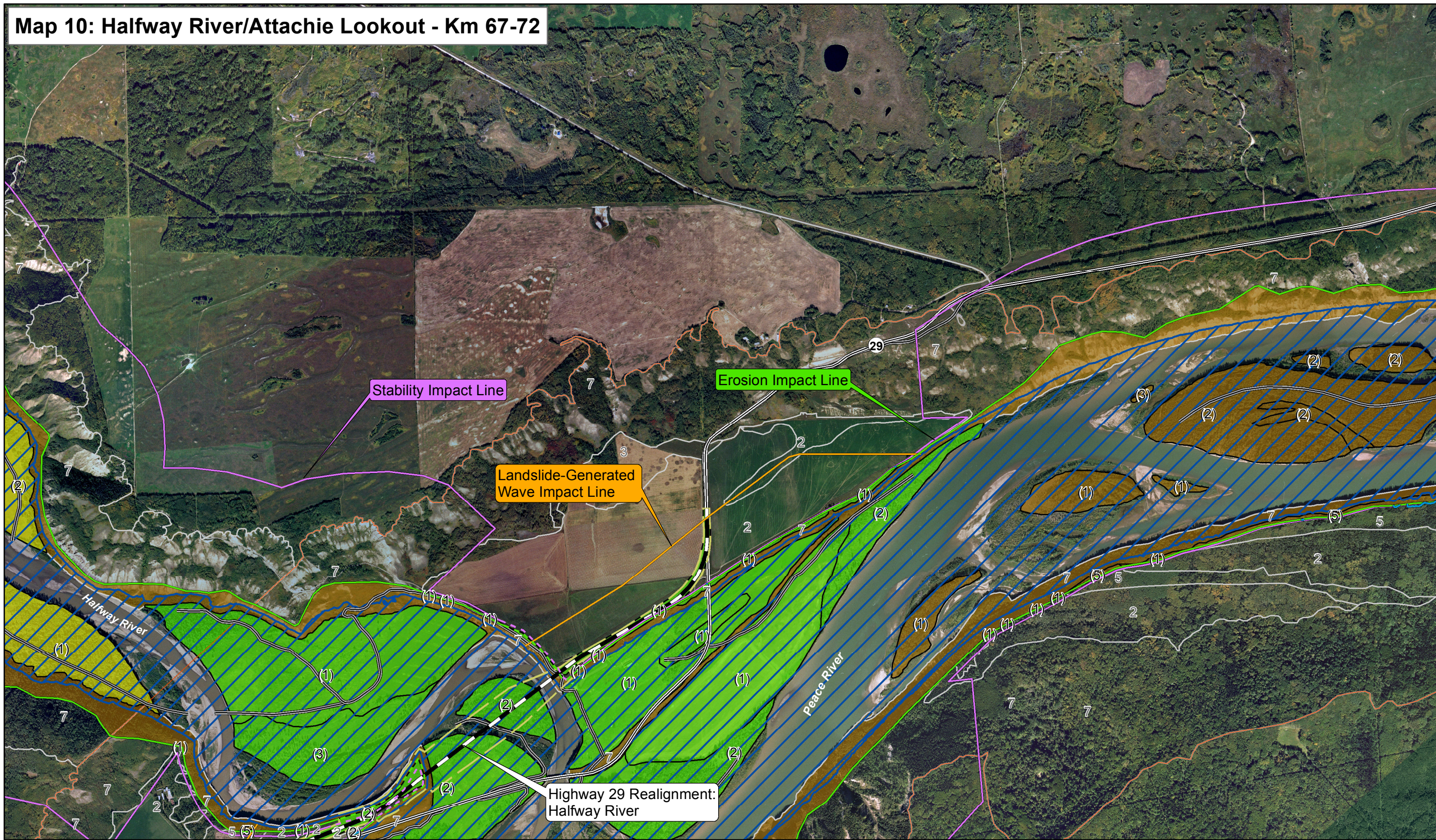


Kilometre	Current Conditions	Reservoir Conditions and Preliminary Impact Lines Related to the Proposed Site C Reservoir
67-72	<p><b>Location</b></p> <p>This map sheet covers from approximately river kilometre 67 to 72 (measured downstream from the W.A.C. Bennett Dam). Attachie Lookout is located at approximately river kilometre 70. Halfway River is located at the upstream end of the map sheet near river kilometre 66.</p> <p><b>Geology and Topography</b></p> <p>The north bank generally comprises a sand and gravel terrace overlying silty shale bedrock. The south bank generally comprises colluvium, interbedded sand, silt and clay, and layers of sand and gravel that overlies silty shale bedrock slopes.</p> <p>The slopes on the south bank upstream of river kilometre 68 are quite high and extend to an elevation of about 660 metres above sea level.</p> <p>The 1973 Attachie landslide originated from the interbedded sand, silt and clay materials from the upper portion of the south bank near river kilometre 65. The debris from this landslide moved rapidly and travelled across the valley, temporarily blocking the river. Should a similar landslide occur under reservoir conditions, it could trigger a wave that could impact the opposite shore.</p> <p><b>Highway 29 and Other Infrastructure</b></p> <p>Highway 29 is located along the north bank of the river. It crosses the terrace on the east side of Halfway River and climbs up to the top of the valley, traversing along the crest of a high slope starting around river kilometre 70.</p> <p>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.</p>	<p><b>Proposed Reservoir</b></p> <p>Within this map sheet, the proposed Site C reservoir would have a width ranging from about 1,000 metres to 1,400 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 32 metres at the upstream end to about 35 metres at the downstream end.</p> <p><b>Preliminary Impact Lines</b></p> <p>Most of the proposed reservoir shoreline comprises steep slopes and the reservoir shoreline and the <b>flood impact line</b> would be located close together in aerial-view when the reservoir is first filled.</p> <p>Between approximately river kilometre 66.5 and 69, the north bank of the proposed reservoir shoreline would predominantly be in sand and gravel. Along this section, predicted shoreline erosion over the life of the project is on the order of 20 metres. The <b>erosion impact line</b> is typically located within 15 to 20 metres of the crest of the slope while the <b>stability impact line</b> is typically located within 20 to 25 metres of the crest of the slope.</p> <p>Downstream of approximately river kilometre 69, the proposed reservoir shoreline would be in silty shale bedrock slopes where minimal erosion is predicted over the life of the project. Where the banks are low, the <b>erosion impact line</b> is typically located near the crest of the riverbank and the <b>stability impact line</b> is typically located within 20 m of the crest of the riverbank.</p> <p>Downstream of river kilometre 69.5, 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 <b>stability impact line</b> encompasses lands at the top of this slope to highlight the ongoing natural potential for landslides. If the project proceeds, groundwater and stability conditions will be monitored during reservoir operation to confirm that the reservoir does not negatively impact slope stability.</p> <p>Starting about river kilometre 66.5, low-lying terraces on the north side of the valley could potentially be affected by waves caused by landslides originating from the slopes adjacent to the 1973 Attachie landslide. Consequently, a <b>landslide-generated wave impact line</b> has been defined in this area. It is a conservative line that considers the potential for combinations of landslide volumes and velocities that very unlikely to occur. The landslide-generated wave impact line roughly follows the 480 metre contour east of Halfway River. The likelihood of landslide-generated waves reaching the landslide-generated wave impact line over the life of the project is considered extremely low.</p> <p><b>Highway 29 Preferred Realignment – Halfway River</b></p> <p>Realignment of Highway 29 at Halfway River is proposed. The highway realignment and proposed bridge have been designed to minimize the potential impacts from landslide-generated waves.</p>
	<p><b>Agriculture Assessment</b></p> <p>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.</p> <p>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.</p>	<p><b>Land Use Within Preliminary Impact Lines</b></p> <p><i>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:</i></p> <ul style="list-style-type: none"><li><i>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)</i></li><li><i>No new residential structures would be permitted within impact lines</i></li><li><i>Non-residential structures could remain, pending site specific geotechnical assessment</i></li><li><i>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</i></li><li><i>Within the Flood, Erosion or Landslide-Generated Wave Impact Line, existing residential structures would not be permitted to remain, to protect public safety</i></li><li><i>Other activities such as agriculture, grazing and trapping could continue within the impact lines</i></li></ul> <p><i>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.</i></p> <p><i>BC Hydro is meeting directly with property owners whose land may be impacted to discuss their specific property interests.</i></p>
	<p><b>Peace River Valley Definition</b></p> <p>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.</p>	

Map 10: Halfway River/Attachie Lookout - Km 67-72



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 Right-Of-Way

Preliminary Impact Lines

- Preliminary Flood Impact Line
- Preliminary Erosion Impact Line
- Preliminary Erosion Impact Line - Subject to final highway design
- Preliminary Landslide-Generated Wave 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.