

PRELIMINARY IMPACT LINES AND LAND USE

Overview

During Stage 2 consultation with communities, stakeholders and the public, BC Hydro introduced an impact line approach to assess the slopes of the proposed Site C reservoir. This approach replaces the previously established “safeline” approach from when the project was reviewed in the 1980s.

The purpose of the reservoir impact line approach is to:

- Protect public safety
- Maximize land use flexibility
- Minimize the amount of land required for the project

Background

The creation of the proposed Site C reservoir would flood land and impact land use in the surrounding area. When Site C was initially examined more than 30 years ago, a residential “safeline” around the potential reservoir was established. Since then, a modern impact line approach has been adopted by BC Hydro, consistent with guidelines from the International Commission on Large Dams. The impact line approach is consistent with recommendation from the British Columbia Utilities Commission in the early 1980s to, where possible, minimize the land acquisition required for the project.

Preliminary impact lines have been determined, and outline potential effects from flooding, erosion, slope instability, and landslide-generated waves that could affect safety and land use around the reservoir.

What We Heard about Impact Lines in Stage 2 (2007-2009)

During Stage 2 consultation, public and stakeholder participants indicated that the residents who live adjacent to the Peace River are aware of and are concerned about erosion and landslides associated with the proposed reservoir, and how these processes could affect public safety, property use, recreation and the environment.

Participants were presented with information regarding the reservoir impact line approach, and asked for their level of agreement with BC Hydro adopting this approach. Overall, 64% of participants agreed (“strongly” or “somewhat”) with the reservoir impact line approach with respect to property and land use, 22% were neutral and 15% disagreed (“strongly” or “somewhat”).

These results were considered during Stage 3 as the reservoir impact line approach was further developed.

Preliminary Impact Lines

Preliminary impact lines have been determined around the proposed Site C reservoir, based on information gathered as part of historical and recent geotechnical investigations and analyses of erosion, seepage and slope stability.

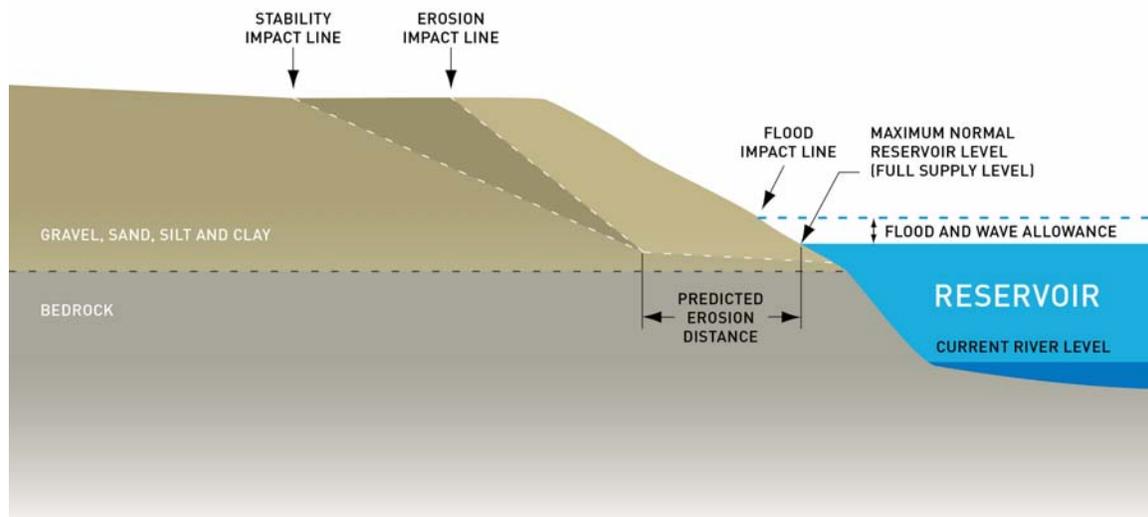
The preliminary impact lines are based on predictions of potential changes to the shoreline from flooding, erosion, and landslides, as a result of the creation of the reservoir.

There are four preliminary impact lines:

Flood Impact Line: the boundary beyond which land is not expected to be affected by flood, wind-generated waves, the operation of the Site C auxiliary spillway, and waves caused by boats and small landslides. The Flood Impact Line is located at an elevation of 466 metres, approximately 4 metres above the Maximum Normal Reservoir Level (Full Supply Level) of the proposed Site C reservoir (461.8 metres). As the Maximum Normal Reservoir Level and Flood Impact Line are based on elevation, their location will change as erosion occurs.

Erosion Impact Line: the boundary beyond which the top of the slope is not expected to regress due to erosion caused by the creation and operation of the reservoir over a period of 100 years. The most active period of erosion would be expected to occur during the first five years of reservoir operation.

Stability Impact Line: the boundary beyond which land is not expected to be affected by landslide events caused by the creation and operation of the reservoir. This line considers extremely unlikely landslide events.



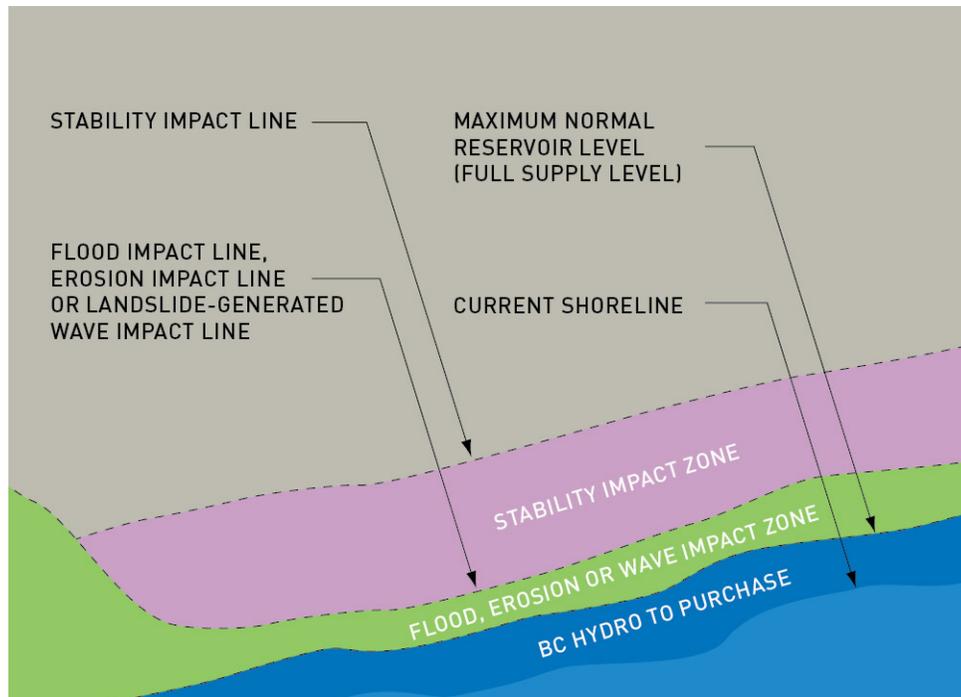
This cross-section illustrates the maximum normal reservoir level and preliminary flood, erosion and stability impact lines

Landslide-Generated Wave Impact Line (Not shown on graphic): a boundary applied to three areas on the north bank (Lynx Creek, Farrell Creek and Halfway River), which comprise less than five per cent of the reservoir shoreline, where landslide-generated waves could temporarily flood elevations higher than the flood impact line. It is based on extremely unlikely landslide events.

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.

The graphic below illustrates, in aerial view, the impact lines and land use zones described below.



BC Hydro's approach:

- 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 zones
- Non-residential structures could remain, pending site specific geotechnical assessment
- Within the Stability Impact Zone, existing residential structures could remain for a period of time, at the owner's request and provided a site specific geotechnical assessment conducted by BC Hydro determines that it is safe to do so
- Within the Flood, Erosion or Landslide-Generated Wave Impact Zone, existing residential structures would not be permitted to remain, to protect public safety

BC Hydro is meeting directly with property owners who may be impacted to discuss their specific property interests and options.

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 would 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.

Next Steps

During the environmental assessment for the Site C project, the preliminary impact lines may be revised once project elements, such as Highway 29 realignment, recreation site locations and potential shoreline mitigation measures are finalized.

Following reservoir filling, impact lines will be reviewed and may be updated following an initial period of monitoring. An additional update of the impact lines will take place following the first five years of reservoir operations.

A full set of maps showing the location of the impact lines around the reservoir is available online at www.bchydro.com/sitec.

Geology of Peace River Slopes

The topography and geology of the reservoir shoreline are the most significant factors influencing impact lines. A typical section, as shown below, might include bedrock underneath old river gravels, sand, silt and clay lake deposits, a layer of till, and another lake deposit.

Each of these materials has different strength, erosion potential, and susceptibility to changes in water levels. Where the proposed reservoir would flood bedrock slopes or old river gravels, minimal effects on slope stability are anticipated. Where the lake deposits are to be flooded, there is a much higher likelihood for beach erosion and increased landslide activity.

BC Hydro has conducted investigations and assessments of the shoreline geology to help determine the impact lines around the proposed Site C reservoir.



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 this document reflects current planning for the Site C Clean Energy Project and is subject to change as the Project continues to be further defined.