

SITE C CLEAN ENERGY PROJECT

WHAT IS SITE C?

The Site C Clean Energy Project is a proposed third dam and hydroelectric generating station on the Peace River.

Site C would be located downstream from the existing Williston Reservoir and two existing BC Hydro dams. As the third project on one river system, Site C would generate 30 per cent of the electricity produced at the W.A.C. Bennett Dam with five per cent of the reservoir area.

The reservoir would be approximately 83 kilometres long and would be, on average, two to three times the width of the current river. The reservoir would be one of the most stable in the BC Hydro system.

Site C is now in the environmental and regulatory review phase, which will include an independent environmental assessment. BC Hydro anticipates formally entering the environmental assessment process in the spring of 2011 with the submission of a project description report.

As part of an environmental assessment of Site C, BC Hydro will identify and assess potential project effects, as well as seek opportunities to provide lasting benefits for the region and Aboriginal groups. Where effects cannot be avoided, BC Hydro will identify and evaluate options for mitigation.

An environmental assessment of Site C will include opportunities for consultation and input by the public, communities, property owners, Aboriginal groups, stakeholders and customers.

The Site C project requires environmental certification, other regulatory permits and approvals, and government decision to proceed before commencing construction.

SITE C CLEAN ENERGY PROJECT

ENGINEERING AND ENVIRONMENTAL STUDIES

Engineering and environmental studies for the Site C Clean Energy Project were conducted in Stage 2 and are continuing in Stage 3.

Studies in Stage 2 – Consultation and Technical Review

- Dozens of environmental and technical field studies conducted in Stage 2
- Public consultation informed the studies
- Input was received from Technical Advisory Committees
- Stage 2 Reports are available at www.bchydro.com/sitec

Studies in Stage 3 – Environmental and Regulatory Review

- Engineering and environmental studies are key activities in Stage 3
- Field studies will continue to collect baseline data, which characterize current conditions
- In Stage 3, studies will also transition from collecting baseline data to completing effects assessments
- The data collected will be used to predict potential effects, and for identifying and evaluating mitigation options



Surveys in wetland between Fort St. John and Hudson's Hope



Bedrock testing at the site of proposed Site C dam

FIELD STUDIES UNDERWAY

FISHER STUDY

To further BC Hydro's understanding of fisher habitat use, population and movement patterns.



Fisher Study

BAT HIBERNACULA STUDY

To document the presence and use of caves, rock crevices or other features where bats hibernate for the winter.

AVIAN STUDY

To gather data on the presence and habitat use of select bird species both within the proposed Site C project area and the region.



Bat Study: long-eared Myotis



Northern goshawk fledgling

CLIMATE MONITORING

To establish a baseline of climate features including air temperature, humidity, wind speed and direction, fog frequency and density, and precipitation in the Peace River valley.



Climate monitoring station near Bear Flat

AIR QUALITY MONITORING

To provide baseline measurements of air quality that are representative of air quality in the area near the proposed Site C dam.



Installation of an air quality monitoring station at Old Fort

FIELD STUDIES UNDERWAY

MULE DEER, MOOSE AND ELK MONITORING

WHY: To further the understanding of mule deer, moose and elk (ungulates) habitat use and movement patterns in the Peace River valley.



Moose in the Peace River valley

WHAT: Three phases: Phase I – capture and collaring; Phase II – monitoring, data collection, analysis; and Phase III – recapture for collar recovery.

In Phase I, approximately 70 animals were captured and outfitted with GPS collars.

Now in Phase II, collared animals are being tracked using a combination of ground-based telemetry and fixed-wing telemetry flights.

Between February and April 2011, limited re-collaring is being done on mule deer, moose and elk; an additional 10 mule deer will also be collared with a VHF (Very High Frequency) collar.

WHEN: Initiated in 2010, monitoring is ongoing and collars will be collected in 2012/2013.

WHERE: The study area is the Peace River valley between Hudson's Hope and the Alberta border.

HOW: The ungulate monitoring program is being led by Keystone Wildlife Research Ltd. and done in conjunction with the Ministry of Forest, Lands and Natural Resource Operations.



Moose tracks



Mule deer in the Peace River valley

FIELD STUDIES (SPRING 2011)

FISH AND AQUATICS STUDIES

WHY: BC Hydro has been conducting a number of studies on fish and fish habitat in the Peace River and tributaries over the last several years to gain an understanding of the resident fish species and fish community interactions in the Peace River system.



Fish Habitat Study

WHAT/WHERE: Continuing studies on the Peace River and tributaries to collect baseline fisheries information by sampling (and releasing) fish by boat, backpack electro-fishing, gill nets and fish traps.

The Peace River Aquatic and Productivity Study collects baseline information on water nutrients, lower trophic-level organisms (e.g., periphyton, plankton) and invertebrates (insects).



Fish measurement

Fish and Aquatics field studies in 2011 will include the following:

- Peace, Halfway and Moberly River Fish Inventories – eight areas of the Peace River from the Peace Canyon Dam into Alberta, and 10 sampling locations on the Halfway and Moberly rivers.
- Fish Movement – five Rotary Screw Trap locations on the Peace, Halfway and Moberly rivers.
- Peace River Aquatic Productivity Study – sampling locations on the Williston Reservoir, Dinosaur Reservoir, Peace River and Halfway, Moberly, Pine and Beatton rivers

WHEN: Recent fisheries studies have been ongoing since 2005 and the Aquatic and Productivity Study was initiated in 2010. All will continue through spring and summer 2011.

HOW: Fish and fish habitat studies are being led by Mainstream Aquatics Ltd. The Aquatic and Productivity Study is led by Golder Associates Ltd.



Fish Movement Study – Installation of trap

FIELD STUDIES (SPRING 2011)

GEOMORPHOLOGY AND SEDIMENT TRANSPORT STUDY

WHY: To characterize baseline river geomorphology, or the shape of the river channels, of the Peace River and its tributaries between the Peace Canyon Dam and the town of Peace River, Alberta. These studies will assess the river form, riverbed material, existing areas of erosion and sediment deposits, and sediment transport rates.



Turbidity sensor data logger housing

WHAT: Suspended sediment gauging equipment will be installed at six sites. The equipment includes a turbidity sensor anchored to the riverbed with a cable running up the river bank to a data logger housed in a metal case. Regular site visits will be made to collect data, check equipment and perform maintenance.



Turbidity sensor

WHEN: Initiated in 2010; field studies to continue April – October 2011.

WHERE: Six sites on the Peace River and tributaries (Pine River, Halfway River, Farrell Creek and Moberly River).

HOW: The Geomorphology and Sediment Transport Study will be led by Knight Piésold Ltd.

FIELD STUDIES (SPRING 2011)

GARTER SNAKE HIBERNACULA STUDY

WHY: To identify locations of dens where snakes hibernate for the winter. The study will also survey potential hibernacula sites identified by Ministry of Forests, Lands and Natural Resource Operations and will confirm the habitat ratings (relative importance) of garter snake hibernating habitat.



Garter Snake, Watson's Slough

WHAT: Ground surveys are being conducted to assess the potential for garter snake hibernacula. Researchers will map and record snakes or signs of snakes (for example, shed skins). Surveyors will target areas with the highest potential to contain hibernacula and any hibernacula found will be photographed.

WHEN: Field studies are scheduled to begin in April 2011 and to continue through the spring to coincide with the emergence of snakes from the hibernacula.

WHERE: Studies will be conducted between the location of the proposed Site C dam and the B.C.- Alberta border.

HOW: The Garter Snake Hibernacula Study is being led by Keystone Wildlife Research Ltd.

FIELD STUDIES (SPRING 2011)

NOISE MONITORING

WHY: To provide baseline measurements of noise near the proposed Site C dam.

What: Noise monitoring equipment to be set up for 24-hour periods in various locations in the Peace River Valley to monitor daytime and nighttime noise levels.

When: Monitoring will take place in several locations over a 10-day period in April 2011.

Where: Equipment will be installed at various locations in the Peace River Valley, near the proposed Site C dam location, between Fort St. John and Hudson's Hope.

How: Noise Monitoring is being led by RWDI Consulting Engineers and Scientists Ltd.



Noise monitoring equipment

FIELD STUDIES (SPRING 2011)

CLEARING PLAN INVESTIGATIONS

WHY: To investigate the feasibility of reservoir clearing access road options and to support a forest inventory.



Boat launch area near Lynx Creek

WHAT: Access roads would be needed as part of the reservoir clearing activities to move clearing equipment into the area, and to transport merchantable timber to area mills.

BC Hydro is updating the clearing plan as part of reservoir preparation planning. The clearing plan will include a forest inventory, evaluation of clearing access road options, and evaluation of waste wood disposal options.

The fieldwork will involve visual inspections on foot of previously proposed clearing access routes, with some aerial inspections using a helicopter. General measurements and observations of terrain and vegetation will be completed.

The forest inventory, which will consist of both field and office work to gather data about the forest, will use mapping, photo interpretation and selected field verification.

WHEN: Field studies are scheduled to begin in May and continue through October 2011.

WHERE: The majority of the fieldwork will be conducted in the potential reservoir area, and the clearing plan will cover areas that may be affected by the project, including the dam, powerhouse, and transmission line right-of-way areas.

HOW: BC Hydro vegetation management specialists will lead this program, with fieldwork supported by forestry consultants.



Forest engineer

FIELD STUDIES (SPRING 2011)

HERITAGE STUDY PROGRAM

WHY: To identify, record and evaluate heritage sites (archaeological sites, historic sites and palaeontological sites) located within the Site C project area.



Site C Heritage Program, 2010

Soil sampling

WHEN: Initiated in 2010; 2011 field work is scheduled for May – December 2011.

WHERE: Heritage assessment will be done for areas that may be affected by the project, including the reservoir, dam, powerhouse, and adjacent construction areas, as well as upland areas such as the expanded transmission line right-of-way, temporary or permanent access roads and construction material sites.

HOW: Archaeological and historic resources assessment will be led by Golder Associates Ltd., with AMEC Earth & Environmental, Millennia Research, Donald Luxton & Associates Inc., and field assistants. Palaeontological resources assessment will be led by Branta Biostratigraphy Ltd.

WHAT:

Archaeological Inventory Assessment (for archaeological and historic resources)

- Visual Surface Inspections
- Subsurface Testing – primarily shovel tests, and some hand auger or power auger tests, with the possibility of some larger test pits being dug with a backhoe
- Sites will be restored once testing is complete
- Archaeological Site Assessment – based on initial surface and subsurface testing results, some areas may require further archaeological site assessment or return visits

Palaeontological Assessment

- Will generally involve surface inspections to assess areas of palaeontological potential, such as steep river banks or exposed bedrock, by helicopter, boat, vehicle and by foot



Conducting shovel tests

FIELD STUDIES (SPRING 2011)

AGRICULTURAL ASSESSMENT STUDY, PROPERTY QUESTIONNAIRE AND INTERVIEW

WHY: To refine and update agricultural resource mapping and to conduct interviews with ranchers and farmers to inform the completion of the baseline agricultural resource inventory and the agricultural assessment.



Bear Flat, Peace River

WHAT: BC Hydro is initiating an Agricultural Assessment Study and will be working with the B.C. Agricultural Land Commission, the B.C. Ministry of Agriculture, potentially affected farmers and ranchers, and the agricultural community in the Peace region.

Soil Sampling and Capability

- Field observations and shovel or hand auger tests to inform soil capability
- All test holes will be filled upon completion

Property Questionnaire

- General land use questionnaire, including identification of primary or historic land uses, groundwater sources, water wells, site conditions of a potentially hazardous nature, wildlife use, and historic buildings or sites

Interview

- Agricultural specialists and BC Hydro will invite agricultural operation owners/operators to participate in an interview to understand their farm operations and the nature and extent of potential project effects on those operations

WHEN: Commenced in December 2010 with a technical review and Geographic Information System (GIS) update, fieldwork is scheduled to begin in May and continue through September 2011.

WHERE: Field studies will occur throughout the proposed project area, with a focus on the proposed reservoir area and transmission line.

HOW: The agricultural assessment study is being led by Golder Associates, Ltd.



Peace River Valley at Halfway River

FIELD STUDIES (SPRING 2011)

SHORELINE GEOTECHNICAL INVESTIGATIONS: IMPACT LINES

WHY: To gather detailed information on the geology and groundwater conditions to improve understanding of the effects of the proposed reservoir on erosion and slope stability. The results will be used to develop impact lines and to guide land use policy. The investigations will also provide geotechnical data for the Highway 29 realignment options.



Installing geotechnical instrumentation

WHAT/WHEN:

Surface Inspections (April – June 2011)

- Visual inspections of land immediately adjacent to the reservoir shoreline

Subsurface Investigations and Instrumentation Installation (May – September 2011):

- Drilling will be required in some areas to collect rock and soil samples and to install instrumentation
- Final drilling locations will be based on the results of the visual inspections
- Geotechnical instrumentation will be installed in drill holes to monitor groundwater and to detect any slope movement
- Sites will be restored once testing is complete

Monitoring of Instrumentation (Ongoing):

- Regular inspections, manual readings and maintenance of instrumentation

WHERE: The study area includes the north bank of the proposed reservoir from several kilometres upstream of Hudson's Hope to between Wilder and Tea Creek, and sites on the south bank opposite the area between Lynx Creek and Bear Flat. To avoid upgrading approximately 30 kilometres of existing access roads and building approximately five kilometres of new road, and due to safety considerations, helicopters will be used to access sites on the south bank during these investigations.

HOW: Geotechnical Investigations are being led by BGC Engineering.



Peace River at Lynx Creek

FIELD STUDIES (SPRING 2011)

DAM SITE INVESTIGATIONS

WHY: Geotechnical investigations at the proposed Site C dam site will be conducted on Crown or BC Hydro-owned land and will determine engineering characteristics required to support the environmental assessment process. Investigations will take place on the north and south banks of the Peace River and the central river island.

WHEN: Fieldwork is scheduled to begin in April and will continue until October 2011.



Adit in north bank of the Peace River



Decker drilling at the proposed dam site

HOW: BC Hydro will be leading the dam site investigation work.

WHAT:

- Establish access to the potential dam site investigation areas, including clearing if required
- Perform geotechnical drilling sampling and testing, including installation and monitoring of instrumentation
- Perform excavation of test pits for collection of bulk samples and testing of engineering characteristics
- Rehabilitation of existing adits to examine the foundation at the proposed dam site and collect samples for laboratory testing



Test pit

Installing geotechnical instrumentation

FIELD STUDIES UPCOMING SUMMER 2011

ENGINEERING INVESTIGATIONS

Construction Material Investigations

BC Hydro will be conducting additional engineering investigations this summer to investigate potential sources of construction materials for the proposed Site C dam and supporting infrastructure.

Highway 29 – Engineering Investigations

Based on consultation and discussions with property owners during Stage 2, and based on additional engineering investigations to be conducted this summer, BC Hydro will prepare a recommended Highway 29 realignment option for this fall.



Highway 29 at Halfway River



Highway 29 at Farrell Creek

Work will include surveying, geotechnical investigations, environment assessments, drainage inspections, existing road and bridge inspections, and clearing trees to construct access routes for equipment to complete investigation work.

Construction Access Roads Required – Engineering Investigations

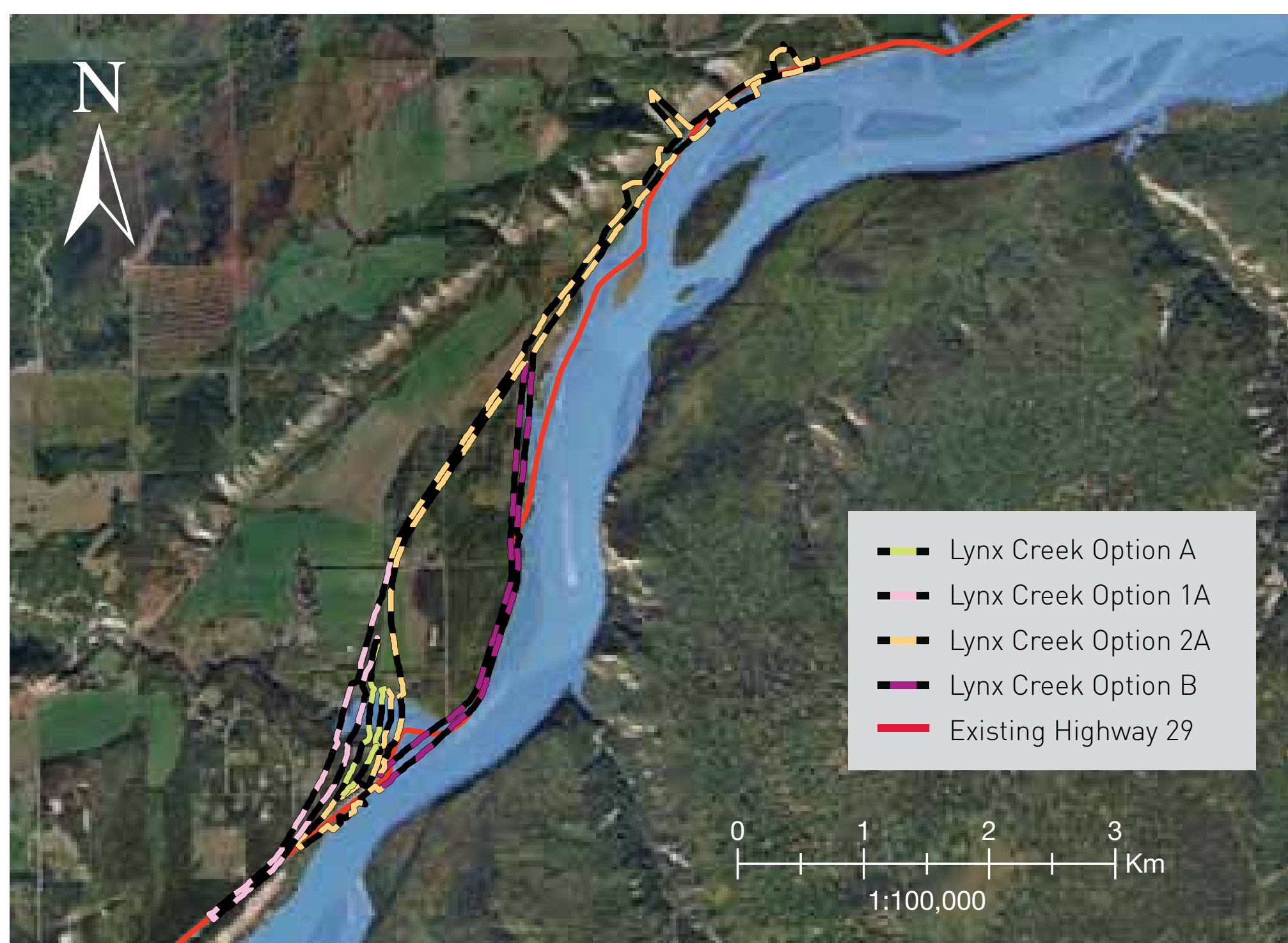
BC Hydro will be conducting engineering investigations of the existing access roads and the adjacent land on the north and south banks of the Peace River and along the existing BC Hydro transmission line right-of-way. These investigations will be used to determine proposed access roads for dam construction service, transmission line and reservoir clearing.



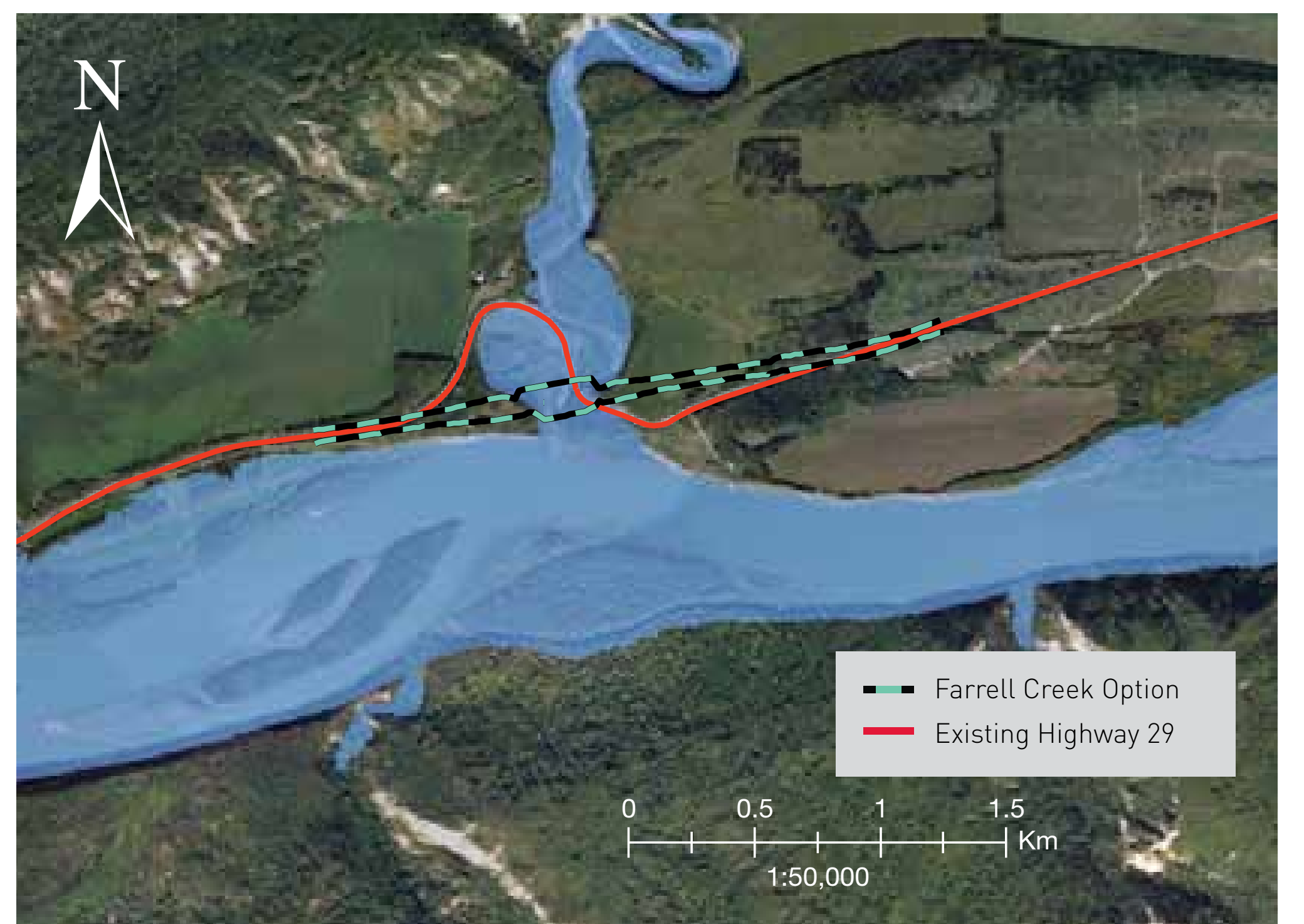
Typical south bank access road

HIGHWAY 29

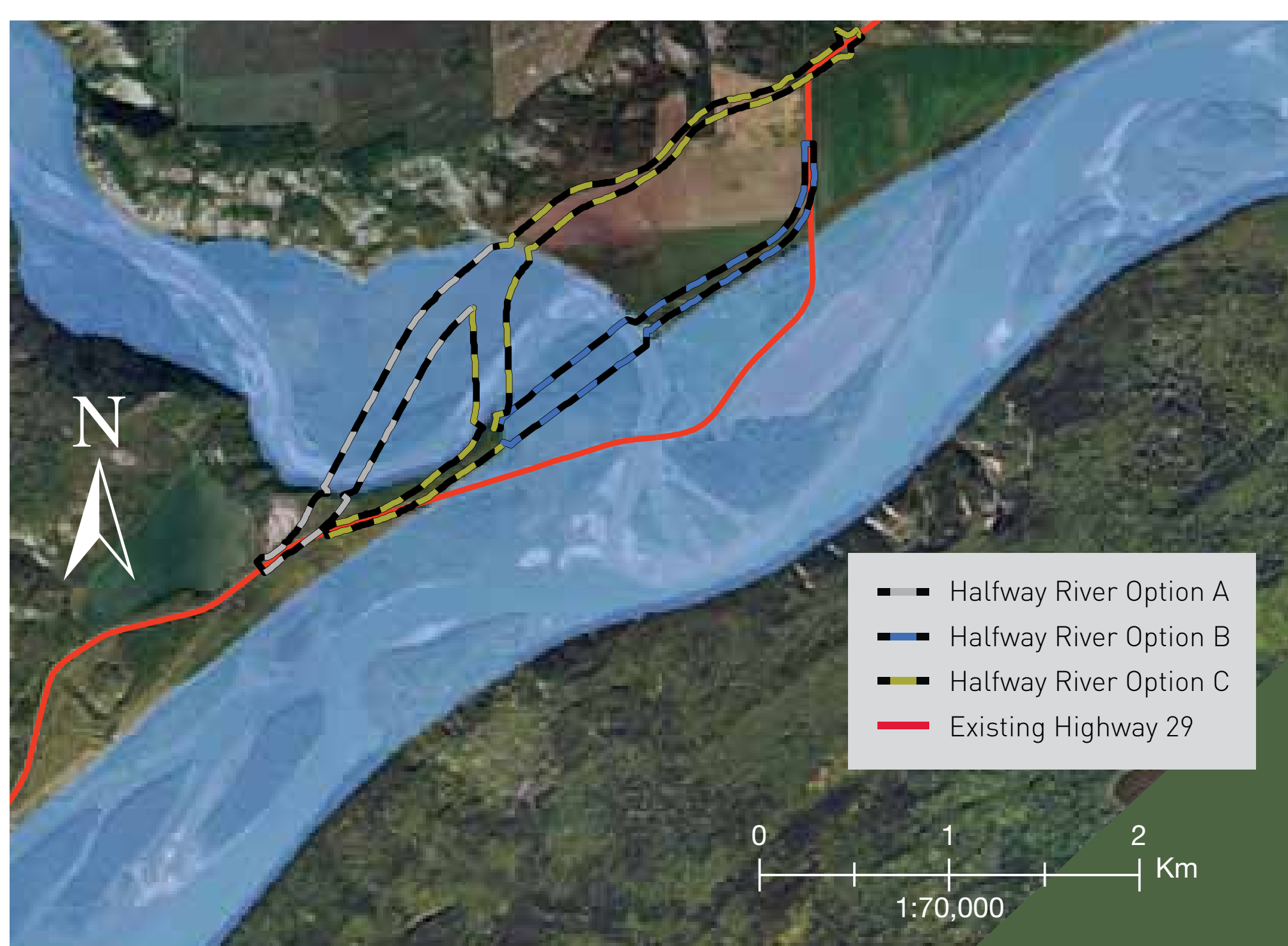
REALIGNMENT OPTIONS



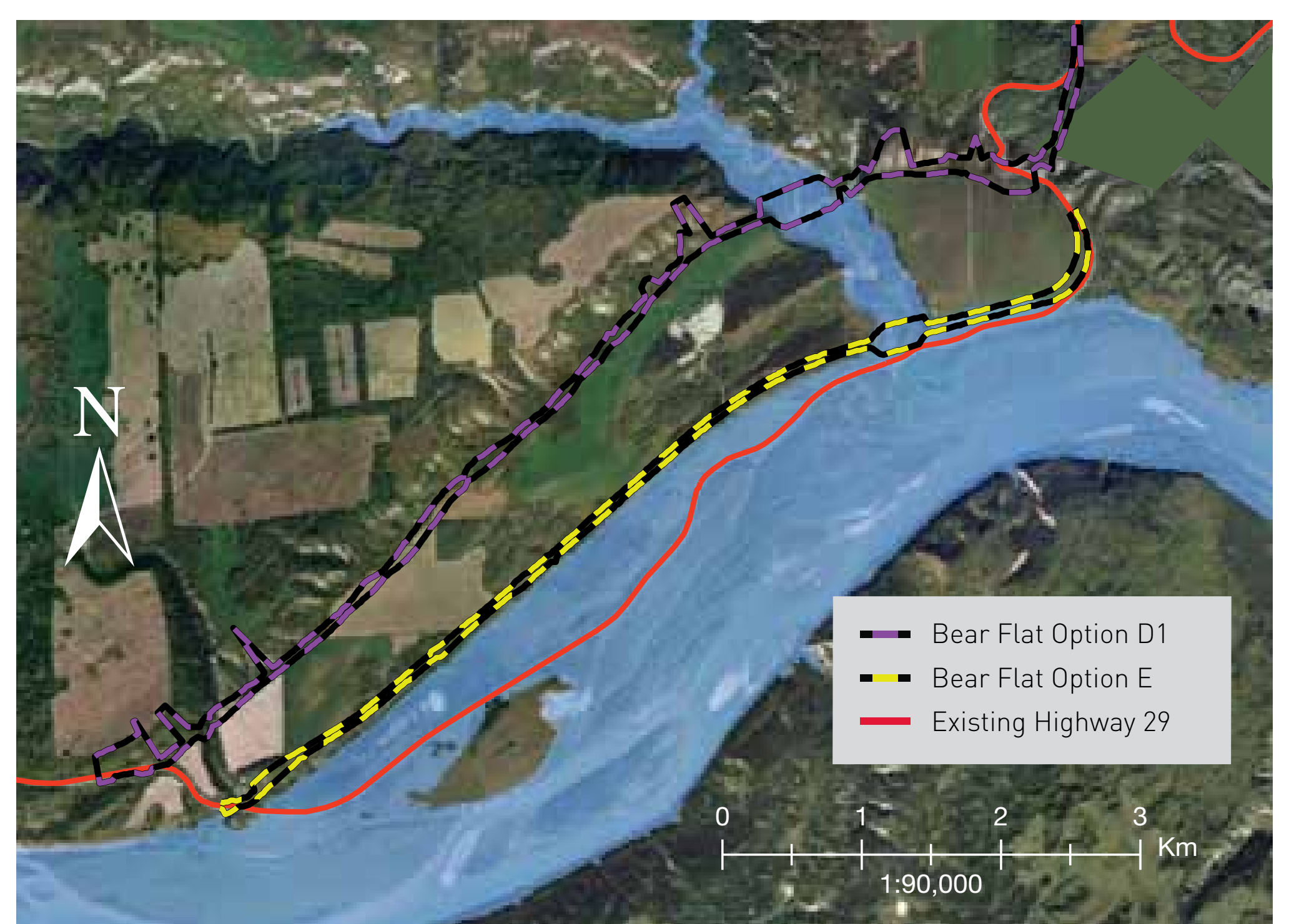
Potential Highway Realignment – Lynx Creek Segment



Potential Highway Realignment – Farrell Creek Segment



Potential Highway Realignment – Halfway River Segment



Potential Highway Realignment – Bear Flat Segment

SITE C CLEAN ENERGY PROJECT

2011 FIELD STUDY SEASON

PROPERTY OWNER MEETING

The Site C Clean Energy Project (Site C) is now in Stage 3, the environmental and regulatory review phase, which will include an independent environmental assessment. Stage 3 work includes conducting environmental and engineering field studies on and around the Peace River between the Williston Reservoir and the Alberta border.

The purpose of tonight's meeting is to provide property owners in the Peace River Region with information about the Site C field studies planned for the 2011 field season.

The meeting will focus on field work starting this spring and will also briefly touch on studies currently underway and those upcoming in the summer.

BC Hydro is seeking permission from property owners to access properties to complete these studies. Studies are also being done on Crown land and BC Hydro-owned land.

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PEACE RIVER – SOUTH BANK

