SITE C CLEAN ENERGY PROJECT

MONTHLY FIELD STUDIES SUMMARY

June 2011

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.

An overview of studies that will be taking place in June 2011 is below. Additional study activities may occur; notice of these studies will be posted at www.bchydro.com/sitec.

Overview
Socio-Economic Studies
♦ Agricultural Assessment Study
♦ Heritage Study Program
♦ Reservoir Clearing Plan Investigations
Fish and Aquatics Studies
♦ Peace, Moberly and Halfway River Fish Movement
♦ Peace, Moberly and Halfway River Fish Inventories
♦ Peace River Aquatic Productivity and Modelling Study
Wildlife Studies
♦ Avian Study Program
♦ Fisher Study Program
♦ Bat Hibernacula Study
♦ Mule Deer, Moose and Elk Study Program
Physical Environment Studies
♦ Geomorphology, Bathymetry and Sediment Transport Studies
♦ Climate and Air Quality Monitoring
Engineering Investigations
♦ Dam Site Investigations
♦ Geotechnical Shoreline Investigations
♦ Highway 29 Surveys

BC Hydro will require the use of helicopters for some engineering and environment field studies this spring and summer. Some field studies may require access to public and private land. BC Hydro will obtain permission before accessing private property and will notify property owners who may be directly impacted by helicopters. Ongoing regular BC Hydro work, in addition to the Site C field study activities outlined here, may be taking place on the Peace River and tributaries. This work is related to BC Hydro's Peace River water license requirements program or other operations work.

Field study updates are available at **www.bchydro.com/sitec** and in the Community Consultation offices in Fort St. John and Hudson's Hope.

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June 2011

Study Name	Description	Timing
Socio-Economic Studies – Agricultural Assessment Study	BC Hydro is conducting an agricultural assessment study for the Site C project. This field program will verify and refine agricultural resource mapping, and conduct interviews with local ranchers, farmers and resource agency specialists to update and gather additional data on agricultural resources in the study area. The study will involve visual inspections of the land for evidence of agricultural resources and soil testing. The study may also involve subsurface testing, consisting of periodic shovel tests supplemented in some cases by use of hand augers. Soil samples may be taken off-site for laboratory testing of agricultural capability parameters including texture, pH, salinity, etc. The lab analyses will not be carried out for contamination testing purposes. For larger agricultural operations, an interview with the owner/operator and tour of the operation will be carried out to verify agricultural resources.	May – September 2011
Socio-Economic Studies – Heritage Study Program	BC Hydro will be continuing the Heritage Study Program of the Site C project area. The archaeological study has been designed in consultation with the B.C. Archaeology Branch and carried out under permits issued under the *Heritage Conservation Act.* The assessment will identify, record and evaluate heritage sites located within the development area; assess potential impacts by the project to these sites; and recommend mitigation options. The majority of the work will be completed with shovel tests, as well as visual inspections of areas with good soil exposures, such as freshly tilled fields. Crews will be primarily on foot, with land access by road or boat, supported occasionally by helicopter or all-terrain vehicles.	May – November 2011

June 2011

Study Name	Description	Timing
Socio-Economic Studies – Reservoir Clearing Plan Investigations	BC Hydro is developing an updated clearing plan as part of the reservoir preparation plan work underway. The clearing plan will include a forest inventory, evaluation of clearing access road options, and evaluation of waste wood disposal options. Forestry professionals will be looking at the terrain and trees to assess the feasibility of existing and planned access routes for clearing activities. This work involves either walking the previously proposed clearing access routes, or by using a helicopter to conduct an aerial assessment of the proposed route. Field crews will be using handheld devices such as compasses and a distance measuring device to measure terrain and vegetation attributes. Crews will take pictures of terrain and vegetation conditions, as well as measurements of vegetation. If previously proposed clearing access routes are confirmed as infeasible then nearby areas will be assessed within the parcel for potentially feasible clearing access.	May – November 2011
Fish and Aquatics Studies – Peace, Moberly and Halfway River Fish Movement	Building on the 2010 fisheries studies, the 2011 study will further understanding of the movement of fish in the Peace River and its tributaries. The study will evaluate the usefulness of the rotary screw trap mechanism to sample fish in the Halfway River. The study will also document the abundance and timing of movement of fish that move downstream from the Halfway and Moberly rivers into the Peace River, and downstream in the Peace River past the proposed Site C dam site during the open water period. The study will further describe the biological characteristics and relative abundance of fish collected by the rotary screw traps.	May – November 2011

June 2011

Study Name	Description	Timing
	There will be five rotary screw traps placed in the rivers. Each trap is housed in a pontoon structure approximately 4m by 7m and will be operated from May through October. The study area includes the lower sections of the Halfway Moberly rivers (one kilometre upstream from the confluence with Peace River), and the Peace River in the immediate vicinity of the Moberly River confluence. Sampling will occur seven days per week alternating three day sampling periods between the Peace, Moberly and Halfway rivers. Access to the sites will be by motorized zodiac.	
Fish and Aquatics Studies – Peace, Moberly and Halfway River Fish Inventories	BC Hydro is continuing fish inventories on the Peace, Moberly and Halfway Rivers. The study will describe the seasonal distribution and relative abundance of fish populations, biological characteristics and fish community assemblages. The study area includes: • The Peace River from the Peace Canyon Dam into Alberta. • The Moberly River from the mainstream river from 19 km downstream of Moberly Lake to the confluence of the Peace River. • The Halfway River from 18 km downstream of the Chowade River to the confluence of the Peace River, approximately 110 km in length. The Peace River study period will occur during three seasons: spring (May); summer (August); and fall (October). The Moberly and Halfway study will occur in summer (August). Sample effort will be based on the number of sites that can be completed per crew-day using a particular fish capture method. A variety of sampling methods will be employed, including boat electro-fishing, backpack electro-fishing, and gill nets.	May – November 2011

June 2011

Study Name	Description	Timing
Fish and Aquatics Studies – Peace, Moberly and Halfway River Aquatic Productivity and Modelling Study	BC Hydro is continuing an aquatic productivity and modelling study in the Peace River. The purpose of the study is to assess current levels of aquatic productivity in order to predict productivity changes resulting from reservoir creation. The study will collect seasonal baseline data to gain an understanding of the current levels of invertebrate, primary production and nutrient dynamics in the system; and assess, determine and run the appropriate predictive modelling for assessing productivity in the current and post reservoir aquatic environment. The 2011 field sampling plan will include the same sampling sites used during the 2010 study: Williston and Dinosaur Reservoirs and the Peace, Halfway, Moberly, Pine and Beatton Rivers.	May – November 2011
Wildlife Studies – Avian Study Program	BC Hydro will be continuing to conduct avian field studies, initiated in 2010, within and adjacent to the Peace River valley between Hudson's Hope and the Alberta border. The objectives of the studies are to gather data on the presence and habitat use of select bird species both within the proposed Site C project area and the region. Data will be collected for northern goshawk, broad-winged hawk, owls, grouse, marsh birds, songbirds and swallows through species-specific surveys. Helicopter based surveys for conspicuous raptor stick nests will also be conducted. Work will include ground based surveys (boat, foot and/or vehicle based) which will be completed using a combination of call playback surveys, point counts and nest searches.	March – September 2011

June 2011

Study Name	Description	Timing
Wildlife Studies – Fisher Study Program	BC Hydro is conducting a study to further the understanding of fisher habitat use and movement patterns in and adjacent to the Peace River Valley. The study area extends from the Peace Canyon Dam to the confluence of the Pine and Peace Rivers on both sides of the Peace River. Fishers are members of the weasel family. They are about 60 cm in length and weigh 3 to 5 kg (6 to 11 lbs). Animals that have been fitted with radio-transmitters will be located monthly, via fixed-wing aircraft flights. Weekly locations will be obtained during ground visits during the breeding season to identify den sites (April through June). Weekly locations will also be obtained all year in some areas.	December 2010 – April 2013 *Tracking of instrumented animals will take place between January 2011 and April 2013*
Wildlife Studies – Bat Hibernacula Study	BC Hydro is conducting a bat hibernacula study. The purpose of the study is to document the presence of bat hibernacula within and outside the proposed Site C reservoir area. The work will be conducted between the location of the proposed Site C project and the Alberta border, and other potential sites in the surrounding area. Acoustic monitoring at potential hibernacula will occur during spring to document emergence and species that are present. Field crew access will be by vehicle and foot.	June 2011

June 2011

Study Name	Description	Timing
Wildlife Studies – Mule Deer, Moose and Elk Study Program	BC Hydro is conducting a mule deer, moose and elk study in the Peace River area from Hudson's Hope to the B.C. – Alberta border. The purpose of the study is to further the understanding of mule deer, moose and elk habitat use and movement patterns in the Peace River region. Monitoring and habitat data collection began in mid-February 2010 and will continue for up to 24 months. Animals will be located using a combination of ground based telemetry and fixed wing telemetry flights. Flights are scheduled for the first and last week of the month (weather dependent). Ground-based locating of animals occurs during both the first and last week of the month.	Phase 2 monitoring will occur from February 2010 to winter 2012.
Physical Environment Studies – Geomorphology, Bathymetry and Sediment Transport Studies	BC Hydro is continuing geomorphology, bathymetry and sediment transport studies started in 2010. These studies will characterize baseline river geomorphology, or shape of the river channels, and sediment transport rates at sites along the Peace River and its tributaries. They will be used to assess the potential effects of the Site C project on river geomorphology, and specifically, potential changes in water turbidity, fish habitat and areas of erosion or deposition. Bathymetric mapping and river bed characterization will be performed at various locations within the Peace River near Hudson's Hope downstream to Many Islands, Alberta. Suspended sediment gauging stations, including turbidity sensors anchored to the river bed with a cable running up the river bank to data loggers housed in metal cases, will be re-installed at four of the locations established in 2010 (Peace River, Pine River, Halfway River and Farrell Creek). At the same time, similar equipment and housing will be installed at two additional sites, one on the Peace River, above the Moberly River, and one on the Moberly River.	April – October 2011

June 2011

Study Name	Description	Timing
	Regular site visits will take place between April and October 2011 to collect data, check equipment and perform maintenance. Field crew access will be by boat and foot.	
Physical Environment Studies - Climate & Air Quality Monitoring in the Peace River Valley	BC Hydro is collecting climate and air quality data from eight monitoring stations on private and BC Hydro owned land between Hudson's Hope and Old Fort, south of Fort St. John. Information on various climate parameters will be gathered, including: air temperature, humidity, wind speed and direction, fog frequency and density, and precipitation. Monitoring of particulate matter (mixture of solid particles and liquid droplets in the air) will be conducted at Old Fort and Halfway River. This data will be used to establish baseline conditions and to inform the effects assessment of the Site C project on in-valley climate and air quality in the area. Stations are visited regularly to retrieve data. Access to the monitoring stations is by vehicle and foot.	June 2011 *Ongoing monitoring from February 2009.*
Engineering Investigations – Dam Site Investigations	BC Hydro is conducting investigations to determine engineering site conditions as required to support the environmental assessment process. Investigations will include performing geotechnical drilling, sampling and testing. Geotechnical instruments (piezometers and/or inclinometers) constructed of PVC pipe will be installed at each of the geotechnical drill holes to facilitate monitoring of groundwater levels or slope movement. Engineering field crews will excavate test pits for collection of bulk soil samples and testing to determine engineering properties. The condition of existing adits will be assessed and rehabilitated to visually inspect the foundation at the proposed dam site and collect samples for laboratory testing.	April – October 2011

June 2011

Study Name	Description	Timing
	Road maintenance to support the investigations will take place as required including the placement of clear span bridges and surveying. Investigations will take place on the north and south banks of the Peace River and the central river island. North bank access will be by vehicle via the north bank access road. South bank access will be by road or boat and access to the central river island will be by boat.	
Engineering Investigations - Geotechnical Shoreline Investigations	BC Hydro is initiating geotechnical investigations along the proposed reservoir slopes to gather more information about shoreline conditions. This program consists of surface inspections, subsurface investigations and the installation and monitoring of geotechnical instruments on both private and Crown land. Surface investigations will include: • Recording any signs of settlement or downslope movement on the ground surface; • Taking photographs, showing existing site conditions for project records; • Inspecting river banks to confirm geology and topography through surface observations and collection of small samples of rock and soil; • Inspecting steep rock bluffs, where present; • Recording any signs of seepage and groundwater conditions; and • Determining if additional drilling or testing is warranted based on surface inspection. Sub-surface investigations will be conducted between May and September and will involve using a drilling rig to drill holes. Prior to the start of any drilling, BC Hydro will carry out archaeological and environmental assessments. In most of the drill holes, geotechnical instruments will be installed to monitor groundwater conditions and movement. The study area for these geotechnical investigations	April – September 2011

June 2011

Study Name	Description	Timing
	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. Personnel, supplies and equipment will be mobilized by helicopter and truck.	
Engineering Investigations – Highway 29 Topographical Survey Program	BC Hydro is conducting a Topographical Survey Program this summer and fall along Highway 29 between Hudson's Hope and Fort St. John. Survey teams will be seen along the highway and surrounding area throughout the study period. Survey crews will be conducting surveys where the potential new alignments of Highway 29 will tie into the existing Highway 29 at Lynx Creek, Farrell Creek, Halfway River and Bear Flat sections. During June and July, the program will establish primary project control for Highway 29 to ensure all design work is referenced to a common coordinate system. Field crews will be setting the control points at 1 and 5 kilometre intervals. Control points will be brass capped monuments attached to 600mm rebar identified by a unique number. The overall accuracy of the LiDAR (laser radar) data for the Highway 29 area will be assessed through ground truthing surveys. The results will determine if the data can be used for design or if traditional topographical field surveys are required. If more accurate data is needed, additional topographical surveys will be completed later this summer and into the fall. BC Hydro will obtain permissions prior to conducting work on private properties.	June – October 2011

Note: Access to public and private land may be required in order to complete study work. BC Hydro will obtain permission from land owners and provide notification to BC Hydro leaseholders before entry onto private or leased lands.