BC Hydro
Power smart

Fisheries and Aquatic Habitat Management Plan Annual Report: Jan 1, 2018 to Dec 31, 2018

Site C Clean Energy Project

March 29, 2019

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1.0 Introduction

1.1 Background

The Fisheries and Aquatic Habitat Management Plan (FAHMP, or the Plan) describes the measures that will be used to mitigate the adverse effects of the Site C Clean Energy Project (the Project) on fish and fish habitat during the construction and operation of the Project. The Plan has been developed in accordance with the conditions of the Project's provincial Environmental Assessment Certificate (EAC #14-02, or the EAC), including the EAC's Schedule B, and Federal Decision Statement issued for the Project, dated October 14, 2014 and reissued November 25, 2014 (the FDS). FDS conditions 8.3 to 8.7 refer to "a fish and fish habitat management plan", while EAC condition 4 refers to "a Fisheries and Aquatic Habitat Management Plan". Each refers to similar requirements for fish and fish habitat. For simplicity, BC Hydro developed one plan, entitled "Fisheries and Aquatic Habitat Management Plan" (FAHMP, or the Plan) that satisfies the conditions of both the EAC and the FDS. Revision 1 of the FAHMP was submitted on June 1, 2015, and is available on the Project's website[1].

As described in the FAHMP Section 7 and per the reporting requirement in condition 8.7 of the FDS – Implementation and Reporting, BC Hydro will provide annual reports on the implementation of the Plan to the Canadian Environmental Assessment Agency (the Agency). Condition 8.7 states:

> The Proponent shall implement the plan and provide to the Agency an analysis and summary of the implementation of the plan, as well as any amendments made to the plan in response to the results, on an annual basis during construction and for the first ten years of operation and once every five years for the next 20 years.

This report is submitted to satisfy Condition 8.7. BC Hydro previously submitted to the Agency annual reports for earlier reporting periods of Project construction. The reporting period for this report covers January 1, 2018 through December 31, 2018.

This report is part of a broader set of information that BC Hydro reports to the Agency, per the FDS, on the Project's construction and environmental management. For example, BC Hydro provides to the Agency 'Monthly Environmental Monitoring Summary Reports' (the Monthly Reports) as follows:

> "Under Section 2.1 of the Construction Environmental Management Plan (CEMP), BC Hydro must submit monthly reports on construction and environmental monitoring activities for the Site C Clean Energy Project to the Independent Environmental Monitor (IEM), the BC Environmental Assessment Office (BCEAO), and the Canadian Environmental Assessment Agency (CEA Agency). The reports must summarize:
>
> - Weekly information provided by contractor Environmental Monitors to BC Hydro;
> - Results of BC Hydro field inspections;
> - Environmental incidents and applicable corrective actions; and
> - Compliance of construction activities with the Environmental Requirements for the Project."

[1] Available at: https://www.sitecproject.com/document-library/environmental-management-plans-and-reports

The Monthly Reports include information on many aspects of the Project's construction and environmental management. This report is specific to the implementation of mitigation measures for fisheries and aquatic habitat that are required under FDS conditions 8.3 to 8.7.

1.2 Status of Project Construction

Construction activities during the reporting period included components described in the Project's Environmental Impact Statement (Volume 1 Section 4 Project Description, sub-section 4.4 Construction).

Significant progress was made across the Project in 2018, both on and off the dam site. At the dam site, the north bank excavation neared completion and work continued on Relocated Surplus Excavated Material (RSEM) areas L5, L6, and Area 25. Excavation of the diversion tunnels on the north bank commenced and continued at both the inlet and outlet portals. On the south bank, excavation and placement of roller compacted concrete for the powerhouse was completed in 2018. Works on the service bay superstructure continued in 2018. Excavation also began for the foundation of the temporary fish passage facility. Assembly of the steel components for the turbine and generator works at site continued and construction of an assembly facility for the steel penstocks began near Fort St. John. Work on the transmission line included tree clearing and vegetation removal, construction of access roads, and installation of transmission tower foundation. Realignment of Highway 29 at Cache Creek commenced with archaeological stripping and road construction taking place at Cache Creek West (4 kilometers of road). In late 2018, reservoir clearing commenced in the Moberly River Valley. River diversion is scheduled to commence in 2020 with reservoir filling and operations beginning in fall 2023.

Additional information on construction progress has been submitted to the Agency previously as part of BC Hydro's Monthly Reports. The Project's website[2] also provides information and regular updates on construction activities.

Construction of the fish habitat enhancement sites in side channels on the south bank of the Peace River downstream of the dam site began in 2018. Construction works included contouring a mainstream bar at Site 108R. Habitat enhancement at this site is described in the FAHMP Section 6.2.1.1, Peace River Channel Contouring and Side Channel Enhancement. Construction will continue in 2019.

Construction of the temporary upstream fish passage facility began in fall 2018. Construction will continue in 2019. The construction and operation of the upstream fish passage facilities is described in the FAHMP Section 6.2.2.2, Upstream Fish Passage.

1.3 Summary

Per FDS Condition 8.7, this report documents the measures to mitigate the adverse effects of the Project on fish and fish habitat during the reporting period (Tables 1 and 2). Standard mitigation measures and Project-specific mitigation measures were implemented to mitigate potential effects on fish and fish habitat in accordance with the implementation schedules in the FAHMP. BC Hydro audits compliance with these requirements by reviewing contractor Environmental Protection Plans (EPPs) and conducting audits and inspections during construction to verify implementation of the mitigation measures outlined in EPPs. The effective

[2] Information on construction activities available at the: https://www.sitecproject.com/construction-activities/construction-bulletins

implementation of these measures was documented during most inspections. Corrective actions, where required, were identified and implemented.

Annual reporting will continue to document the implementation of the FAHMP. In addition, monitoring of physical habitat, lower trophic levels, fish abundance, and community composition under the Fisheries and Aquatic Habitat Monitoring and Follow-up Program (FAHMFP) will provide information to evaluate the effectiveness of these measures to mitigate potential effects on fish and fish habitat over the longer term.

2.0 Fisheries and Aquatic Habitat Management Plan

The objective of this report (the Report) is to describe the mitigation measures implemented during this period to meet the reporting requirements of FDS condition 8.7. The Report follows the information in Section 7.0 Implementation and Reporting of the FAHMP.

Tables 1 and 2 outline the structure of the Report. These tables list the Conditions (and components of the Conditions), as well as the corresponding sections of the FAHMP that pertain to the Conditions. These tables also list whether components within the Conditions occurred or were implemented during the reporting period, and if so, the corresponding section in the Report that summarizes the implementation. Section 7 of the Report is an analysis of implementation of the Plan.

Table 1. Environmental Assessment Certificate Conditions and Relevant Plan Sections**.**

EAC Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
FISH AND FISH HABITAT				
4	The EAC Holder must manage harmful Project effects on fish and fish habitats during the construction and operation phases by implementing mitigation measures detailed in a Fisheries and Aquatic Habitat Management Plan.	Described in rows below.	Described in rows below	Not Applicable
	The Fisheries and Aquatic Habitat Management Plan must be developed by a QEP	No. Occurred prior to the reporting period.	Not Applicable	This condition is addressed in FAHMP Section 8.0 Qualified Professionals
	The Fisheries and Aquatic Habitat Management Plan must include at	Described in rows below.	Described in rows below	Described in rows below

EAC Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
	least the following:			
	• Remove temporary structures as soon as they are no longer required.	Yes	Section 3.1	These conditions are addressed in Construction Environmental Management Plan (CEMP) Section 4.5, Fisheries and Aquatic Habitat Management.
	• Maintain a 15 m machine free zone adjacent to watercourses during reservoir clearing (as measured from the Ordinary High Water Mark).	Yes	Section 3.2	
	• Place material relocation sites (R5a, R5b, and R6) 15 m back from the mainstem to avoid affecting Peace River fish habitat.	Yes	Section 3.3	
	• Contour mainstream bars to reduce potential for fish stranding, as advised by FLNR.	Yes	Section 3.4	This condition is addressed in FAHMP Section 6.2.1.1, Peace River Channel Contouring and Side Channel Enhancement.
	• Incorporate fish habitat features into the final capping of	No, planned for implementation during subsequent stage of construction.	Not Applicable	This condition is addressed in FAHMP Section 6.2.3.4, Dam Site Material

EAC Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
	material relocation sites upstream of the dam.			Relocation Site Enhancement.
	• Contour and cap with gravels and cobble substrate the spoil area between elevations 455 m and 461 m to provide a productive fish habitat that will be available to fish during the operation phase.	No, planned for implementation during subsequent stage of construction.	Not Applicable	This condition is addressed in FAHMP Section 6.2.3.4, Dam Site Material Relocation Site Enhancement.
	• Include fish habitat features (e.g., shears, large riprap point bars, etc.) in the final design of the north bank haul road bed material that would be placed in the Peace River.	No, constructed and reported during previous reporting period.	Not Applicable	This condition is addressed in FAHMP Section 6.2.1.2, River Road Habitat Enhancement.
	• Incorporate fish habitat features into the final design of the Highway 29 roadway that	No, planned for implementation during subsequent stage of construction.	Not Applicable	This condition is addressed in FAHMP Section 6.2.3.2, Highway 29 Realignment Fish Habitat.

EAC Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
	would border the reservoir, east of Lynx Creek.			
	• Construct the Hudson‘s Hope shoreline protection with large material that will provide replacement fish habitat.	No, planned for implementation during subsequent stage of construction.	Not Applicable	This condition is addressed in FAHMP Section 6.2.3.3, Hudson’s Hope Shoreline Protection Fish Habitat.
	• Incorporate additional fish habitat features (e.g., shear zones and point bars) into the final design of the Hudson‘s Hope shoreline protection.	No, planned for implementation during subsequent stage of construction.	Not Applicable	This condition is addressed in FAHMP Section 6.2.3.3, Hudson’s Hope Shoreline Protection Fish Habitat.
	• Contour Highway 29 borrow sites prior to decommissioning to provide littoral fish habitat in the reservoir.	No, planned for implementation during subsequent stage of construction.	Not Applicable	This condition is addressed in FAHMP Section 6.2.3.1, Site C Reservoir Shoreline Enhancement.
	• Cap material repositioning areas with gravel and cobble, and contour to enhance fish habitat	No, planned for implementation during subsequent stage of construction.	Not Applicable	This condition is addressed in FAHMP Section 6.2.3.4, Dam Site Material Relocation Site Enhancement.

EAC Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
	conditions.			
	• Plant a 15 m wide riparian area along the reservoir shoreline adjacent to BC Hydro-owned farmland where necessary to provide riparian habitat and bank stabilization except as approved by the onsite environmental monitor.	No, planned for implementation during subsequent stage of construction.	Not Applicable	This condition is addressed in FAHMP Section 6.2.3.5, Reservoir Shoreline Riparian Planting.
	• Increase wetted habitat by creating new wetted channels and restoring back channels on the south bank island downstream of the dam.	Yes	Section 3.5	This condition is addressed in FAHMP Section 6.2.1.1, Peace River Channel Contouring and Side Channel Enhancement.
	• Enhance side channel complexes between the dam site and the confluence of the Peace and Pine rivers during low flows.	Yes	Section 3.5	This condition is addressed in FAHMP Section 6.2.1.1, Peace River Channel Contouring and Side Channel Enhancement.

EAC Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
	• Manage reservoir fluctuation within a 1.8 m maximum normal operating range from the maximum operating level of 461.8 m.	No. Will occur during Project operations.	Not Applicable	
	• If the reservoir deviates from the normal operating range, the EAC Holder must report the event in accordance with water licence requirements.	No. Condition applies to Project operations.	Not Applicable	
	The EAC Holder must manage construction footprints to reduce the harmful Project effects on fish and fish habitat, in accordance with the conditions of the applicable *Fisheries Act* authorization(s) and direction provided by FLNR.	Yes. Construction footprints were in accordance with the conditions of the applicable *Fisheries Act* authorizations.		
	This draft Fisheries and Aquatic	No. Occurred prior to the reporting	Not Applicable	This condition is addressed in

EAC Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
	Habitat Management Plan must be provided to FLNR, MOE and Aboriginal Groups for review a minimum of 90 days prior to commencement of construction.	period.		FAHMP Section 2.3 Consultation
	The EAC Holder must file the Final Fisheries and Aquatic Habitat Management Plan with EAO, FLNR, MOE and Aboriginal Groups a minimum of 30 days prior to commencement of construction.	No. Occurred prior to the reporting period.	Not Applicable	
	The EAC Holder must develop, implement and adhere to the Final Fisheries and Aquatic Habitat Management Plan, and any amendments, to the satisfaction of EAO.			

Table 2. Federal Decision Statement Conditions and Relevant Plan Sections.

FDS Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
8.	**Fish and Fish Habitat**			
8.1	The Proponent shall undertake efforts to avoid or minimize adverse impacts to fish and fish habitat to ensure the continued availability of fisheries resources in the Local Assessment Area.	Yes, see rows below.	See rows below.	
8.2	The Proponent shall prepare and submit to the Agency an annual schedule identifying the location and timing of construction activities that may impact fish or fish habitat 90 days prior to such activities occurring.	Yes	Not applicable	Submitted under separate cover.
8.3.	The Proponent shall prepare, in consultation with Fisheries and Oceans Canada, Reservoir Area Aboriginal groups and Immediate Downstream Aboriginal groups, a fish and fish habitat management plan.	No. Occurred prior to the reporting period.	Not applicable	These conditions are addressed in the Fisheries and Aquatic Habitat Management Plan (FAHMP).
8.4	The Plan shall include:			
8.4.1.	Identification of baseline conditions for fish and	No. Occurred prior to the	Not applicable	This condition is addressed in

FDS Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
	fish habitat in the Local Assessment Area;	reporting period		FAHMP Section 4.0, Fish and Fish Habitat Baseline Conditions.
8.4.2.	Measures to mitigate potential effects on fish and fish habitat during construction and operation of the Designated Project including:	Yes, see rows below.	See rows below.	This condition is addressed in FAHMP Section 6.0, Fish and Fish Habitat Mitigation.
8.4.2.1.	Erosion and sediment control measures, riparian zone avoidance measures, best practices for watercourse crossings, in-stream work guidelines, and in-stream work timing windows;	Yes	Section 3.6	These conditions are addressed in CEMP Section 4.5, Fisheries and Aquatic Habitat Management.
8.4.2.2.	Measures to avoid or reduce fish stranding;	Yes	Section 3.7	This condition is addressed in CEMP Section 4.5, Fisheries and Aquatic Habitat Management. See also FAHMP 6.2.1.1, Peace River Channel Contouring and Side Channel Enhancement.
8.4.2.3.	Operational practices, technologies and design features that minimize downstream fish	No, planned for implementation during	Not Applicable	This condition is addressed in FAHMP Section 6.2.2.1, Fish

FDS Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
	entrainment past the dam site;	subsequent stage of construction.		Entrainment.
8.4.2.4.	Measures to mitigate the effects of Total Dissolved Gas concentrations in tailwater on fish; and	No, planned for implementation during subsequent stage of construction.	Not Applicable	This condition is addressed in FAHMP Section 6.2.2.3, Mitigation of Total Dissolved Gas.
8.4.2.5.	Measures to mitigate obstructed upstream fish passage for bull trout and, as appropriate and feasible, other migrating fish species;	No, planned for implementation during subsequent stage of construction.	Section 3.8	This condition is addressed in FAHMP Section 6.2.2.2, Upstream Fish Passage.
8.4.3.	An approach to monitor changes to fish and fish habitat baseline conditions in the Local Assessment Area;	Yes	Section 3.9	The approach is summarized in FAHMP Section 2.2, Scope as well in the monitoring programs listed in Appendix D. Further information on monitoring is provided in the Fisheries and Aquatic Habitat Monitoring and Follow-up Program.
8.4.4.	An approach to monitor and evaluate the effectiveness of mitigation or offsetting measures and to verify the accuracy of the predictions made during the environmental assessment on fish and	Yes, monitoring and evaluation occurred per the approach in the Project's Fisheries and Aquatic Habitat Monitoring and	Section 3.9	The approach is summarized in FAHMP Section 2.2, Scope as well in the monitoring programs listed in Appendix D. Further information on monitoring is

FDS Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
	fish habitat; and	Follow-up Program.		provided in the Fisheries and Aquatic Habitat Monitoring and Follow-up Program.
8.4.5.	Any other requirements identified by Fisheries and Oceans Canada in support of its application for an authorization under the *Fisheries Act*.	Not applicable	Section 3.10	To date, Fisheries and Oceans Canada has not identified other requirements in support of an application for an authorization under the *Fisheries Act*. Should DFO identify other requirements, these will be taken into account in amendments to the plan, as described in condition 8.7
8.5.	The Proponent shall submit a draft copy of the plan to the Agency, Fisheries and Oceans Canada, Reservoir Area Aboriginal groups and Immediate Downstream Aboriginal groups 90 days prior to submitting its application for authorization under the *Fisheries Act*.	No. Occurred prior to the reporting period.	Not Applicable	This condition is addressed in FAHMP Section 2.3 Consultation
8.6.	The Proponent shall submit to the Agency the final plan a minimum of 30 days prior to submitting its application for authorization under the Fisheries Act. When	No. Occurred prior to the reporting period.	Not Applicable	This condition is addressed in FAHMP Section 2.3 Consultation

FDS Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
	submitting the final plan, the Proponent shall provide to the Agency an analysis that demonstrates how it has appropriately considered the input, views or information received from Fisheries and Oceans Canada, Reservoir Area Aboriginal groups and Immediate Downstream Aboriginal groups and shall describe how it has taken the plan into consideration as part of its application for an authorization under the Fisheries Act.			
8.7.	The Proponent shall implement the plan and provide to the Agency an analysis and summary of the implementation of the plan, as well as any amendments made to the plan in response to the results, on an annual basis during construction and for the first ten years of operation and once every five years for the next 20 years.	Yes	This report, addressed Condition 8.7	This condition is addressed in FAHMP Section 7 Reporting
8.8	The Proponent shall develop an offsetting plan, in consultation with Fisheries and Oceans Canada, to offset residual serious harm to fish and monitor the effectiveness of offsets.	No, plan developed during a previous reporting period.	Section 3.11	Offsetting plans were submitted as a component of the applications for authorization under the Fisheries Act. Information from offsetting plans was submitted to CEAA as described under

FDS Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
				FDS Condition 8.9.
8.9	The Proponent shall conduct an analysis for any physical fish habitat offsets proposed in the offsetting plan, in consultation with Transport Canada, Environment Canada, Reservoir Area Aboriginal groups and Immediate Downstream Aboriginal groups, that includes:	No, occurred during a previous reporting period.	Section 3.12	These conditions were met in a separate analysis.
8.9.1	the effects on migratory birds and their habitats;			
8.9.2	the effects on terrestrial species and their habitats;			
8.9.3	the effects on species at risk and species at risk habitat;			
8.9.4	the effects on current use of lands and resources for traditional purposes by Aboriginal peoples;			

FDS Condition	Condition	Occurred During Construction Period for Report	Section in this Report	Plan Reference
8.9.5	identification of navigation impacts; and			
8.9.6	identification of potential sources of contamination (e.g. mercury).			
8.10	The Proponent shall submit to the Agency the results of the analysis in condition 8.9, including a description of how the input, views or information received have been taken into account in finalizing its fish habitat offsetting plan.	No, occurred during a previous reporting period.	Section 3.12	This condition was met in a stand-alone document that was submitted to CEAA on June 24, 2016 prior to implementing the offsetting plan.

3.0 Summary of Plan Implementation

Section 3.1 "Remove temporary structures as soon as they are no longer required."

Temporary bridges used to access areas for reservoir clearing were removed once clearing activities were completed.

Section 3.2 "Maintain a 15 m machine free zone adjacent to watercourses during reservoir clearing (as measured from the Ordinary High Water Mark)."

Initial components of reservoir clearing occurred during the reporting period. A machine free zone was used to reduce potential effects on riparian areas.

Section 3.3 "Place material relocation sites (R5a, R5b, and R6) 15 m back from the mainstem to avoid affecting Peace River fish habitat."

Development of Relocated Surplus Excavated Material (RSEM) areas R5a, R5b and R6 commenced greater than 15 m back from the mainstem to avoid affecting Peace River fish habitat.

Section 3.4 "Contour mainstream bars to reduce potential for fish stranding, as advised by FLNR."

Peace River Channel Contouring and Side Channel Enhancement (described in FAHMP Section 6.2.1.1) are scheduled to occur over many years, per the schedule in the FAHMP. Contouring of some bar areas occurred during previous reporting periods. Construction works to contour a mainstream bar at Site 108R in the Peace River occurred during the reporting period. As well, physical and biological monitoring of the previously contoured bar occurred during the reporting period, in accordance with the FAHMFP.

Section 3.5 "Increase wetted habitat by creating new wetted channels and restoring back channels on the south bank island downstream of the dam. Enhance side channel complexes between the dam site and the confluence of the Peace and Pine rivers during low flows."

Construction of the fish habitat enhancement sites in side channels on the south bank of the Peace River downstream of the dam site began in 2018. Habitat enhancement at this site is described in the FAHMP Section 6.2.1.1, Peace River Channel Contouring and Side Channel Enhancement. Construction will continue in 2019.

Section 3.6 "The Plan shall include: Erosion and sediment control measures, riparian zone avoidance measures, best practices for watercourse crossings, in-stream work guidelines, and in-stream work timing windows."

These measures are listed in the CEMP Section 4.5, Fisheries and Aquatic Habitat Management. The CEMP specifies the requirements for site-specific EPPs that are developed for specific components of work. BC Hydro audits compliance with this requirement by reviewing contractor EPPs and conducting environmental audits during construction to verify implementation of the EPPs. In addition, BC Hydro has implemented an enhanced site-wide erosion and sediment control program that requires assessment of sites and preparation of

detailed prescriptions by Qualified Erosion and Sediment Control Professionals and overseeing installation of measures by these professionals and ongoing re-inspections. Environmental issues and associated corrective actions reported during environmental monitoring and compliance auditing are described in the BC Hydro Monthly Environmental Monitoring Summary Reports. Monthly reports for 2018 have been submitted to the Agency, with the exception of reports for November and December which were being finalized at the time of writing this report.

Suspended sediment levels in the Peace River, as well as inputs to the Peace River as a result of construction, were monitored in the reporting report and indicated that construction inputs were low relative to the background suspended sediment levels. These results are consistent with past years and predictions in the Project's Environmental Impact Statement (EIS). Baseline suspended sediment load in the Peace River at the dam site is estimated at 1,136,000 tonnes / year, and increases to 3,540,000 tonnes / year downstream of the Pine River confluence (Table 5.3 and Fig 5.3a of the EIS, Vol 2 Appendix I Fluvial Geomorphology and Sediment Transport Technical Data Report). Over the ten-year construction phase, fine sediment inputs related to instream construction activities would represent an estimated increase of 0.2% to 0.3% above mean annual baseline sediment load immediately downstream of the Site C dam site (EIS Volume 2 Appendix I).

During the reporting period there were environmental incidents and near misses related to fish and fish habitat. No adverse effects on fish and fish habitat resulted from these incidents. Below is a summary of these incidents.

On January 31, 2018, a machine entered a Riparian Vegetation Management Area (RVMA) that bordered a wetland. The wetland primarily runs parallel to the Site C Transmission Line however there is a small section that encroaches on the transmission line. The operator's GPS device showed the machine outside of the RVMA, but the accuracy of the GPS was lower than normal due to electrical interference from the overhead powerlines. The operator immediately stopped the machine once he realized he had entered the RVMA. The incident resulted in no impact to the wetland as the RVMA was frozen and covered in snow. Vegetation at this site consisted of very sparse poplar saplings that were hand cleared later that afternoon.

On August 23, 2018, sediment-laden water originating from Highway 29 drilling activities had breached the rolled tarp containment and spilled onto the bank of the Peace River. Water flowed off of the tarp, through a hole in the ground and exited down the bank. The contractor immediately turned the drill off, sediment logs were used to block and filter water flowing down slope. Erosion and sediment control measures were inspected and containment was re-rolled.

On September 8 and 9, 2018, a discharge of approximately four million litres of low pH, partially treated storm water from the RSEM R5b pond into the Peace River occurred during a 55-mm rain event. The discharge was a relatively small volume of approximately 34 litres per second over a 26-hour period into a flow in the Peace River of approximately 1.2 million litres per second. As such, the water was immediately diluted (within 100m of the discharge location) with no harmful effects observed. Following this event, the Comptroller of Water Rights requested a review of the capacity of the care of water system on the right bank approach channel. Environment Canada is also investigating the incident. BC Hydro is taking action to increase the holding capacity and effectiveness of the care of water system and to remove the weathered acidic rock to reduce the potential for a similar reoccurrence.

Section 3.7 "The Plan shall include: Measures to avoid or reduce fish stranding."

The contouring of mainstem bars (described in the Section 3.4) has reduced the risk of fish stranding by reducing the area of the bars that dewaters when discharge in the Peace River fluctuates.

Section 3.8 "Measures to mitigate obstructed upstream fish passage for bull trout and, as appropriate and feasible, other migrating fish species."

Construction of the temporary upstream fish passage facility began in fall 2018. Construction will continue in 2019. The construction and operation of the upstream fish passage facilities is described in the FAHMP Section 6.2.2.2, Upstream Fish Passage.

Section 3.9 "The Plan shall include: An approach to monitor changes to fish and fish habitat baseline conditions in the Local Assessment Area.

An approach to monitor and evaluate the effectiveness of mitigation or offsetting measures and to verify the accuracy of the predictions made during the environmental assessment on fish and fish habitat."

BC Hydro developed and implemented the FAHMFP[3] to monitor changes in habitat conditions in the Local Assessment Area and the effectiveness of mitigation and offsetting measures, and to verify the predictions made during the environmental assessment. The general monitoring approach in the FAHMFP is to monitor changes in baseline conditions in the Local Assessment Area for physical habitat, lower trophic levels, fish abundance, and community composition. This information will be used to evaluate the effectiveness of Project mitigation or offsetting measures and verify the accuracy of predictions made during the Environmental Assessment. Monitoring under the FAHMFP in 2018 will be summarized in BC Hydro's report: Fisheries and Aquatic Habitat Monitoring and Follow-up Program Annual Report: Jan 1, 2018 to Dec 31, 2018. Previous reports under the FAHMFP are available on the Project website[4].

Section 3.10 "The Plan shall include: Any other requirements identified by Fisheries and Oceans Canada in support of its application for an authorization under the Fisheries Act."

Fisheries and Oceans Canada has not identified other requirements in support of an application for an authorization under the *Fisheries Act* in addition to those in the FAHMP.

Section 3.11 "The Proponent shall develop an offsetting plan, in consultation with Fisheries and Oceans Canada, to offset residual serious harm to fish and monitor the effectiveness of offsets."

Offsetting plans were developed in consultation with Fisheries and Oceans Canada, and are described in:

[3] Available at: https://www.sitecproject.com/document-library/environmental-management
[4] Available at: https://www.sitecproject.com/sites/default/files/report-annual-fahmfp-2017-20180301.pdf

1. “Section 9.0 Offsetting Plan” of the document titled “DFO – Application for Authorization Site Preparation – Site C Clean Energy Project British Columbia Hydro and Power Authority”
2. “Section 9.0 Offsetting Plan” of the document titled “DFO – Application for Authorization Dam Construction, Reservoir Preparation, and Filling – Site C Clean Energy Project British Columbia Hydro and Power Authority"

Section 3.12 Conditions 8.9 and 8.10 refer to “an analysis for any physical fish habitat offsets proposed in the offsetting plan.”

The analysis of physical fish habitat offsets[5] was completed and submitted to the Agency during a previous reporting period.

[5] “Site C Clean Energy Project, Site Preparation: Environmental Analysis of Physical Fish Habitat Offsets” dated Aug 5, 2015 and “Site C Clean Energy Project, Dam Construction, Reservoir Preparation and Filling: Environmental Analysis of Physical Fish Habitat Offsets” dated June 24, 2016.

4.0 Analysis of Plan Implementation

The FAHMP describes the following categories of measures:

- Standard mitigation measures during construction activities described in the CEMP (e.g., erosion and sediment control measures); and
- Project-specific mitigation measures described in the FAHMP (e.g., habitat enhancements for reservoir shoreline habitat enhancement works, capping of dam site material relocation site with fish habitat features).

During the reporting period, both standard mitigation measures and Project-specific mitigation measures were implemented to mitigate potential effects on fish and fish habitat.

Monitoring of physical habitat, lower trophic levels, fish abundance, and community composition under the FAHMFP will provide information to evaluate the effectiveness of these measures to mitigate potential effects on fish and fish habitat over the longer term.

5.0 Revisions to the Plan

No revisions to the Fisheries and Aquatic Habitat Management Plan have been required since Revision 1 dated June 1, 2015.

6.0 Qualified Professionals

This report was prepared by the following Qualified Individuals:

Qualified Individual	Expertise
Brent Mossop, MRM, RPBio	Fisheries
Nich Burnett, MSc, RPBio	Fisheries

Figure 1. Fish salvage occurred in RSEM L5 (top) and RSEM L6 (bottom) (April 25, 2018).

Figure 2. Fish were excluded using stop-nets during restoration of the back channel on the south bank island downstream of the dam (November 16, 2018).

Figure 3. Biodegradable hydraulic fluids were used in equipment working above or within wetted areas during the construction of RSEM L6 (November 6, 2018).

Figure 4. Water intakes were screened in accordance with Fisheries and Oceans Canada's Freshwater Intake End-of-Pipe Fish Screen Guidelines (July 2, 2018).