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October 4, 2019

Mr. Patrick Wruck
Commission Secretary and Manager
Regulatory Support
British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Mr. Wruck:

**RE: British Columbia Utilities Commission (BCUC or Commission)
British Columbia Hydro and Power Authority (BC Hydro)
Site C Clean Energy Project
PUBLIC Quarterly Progress Report No. 16 – April to June 2019 (Report)**

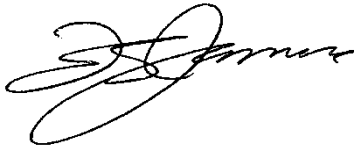
BC Hydro writes to provide its public Report.

Commercially sensitive and contractor-specific information has been redacted.

A confidential version of the Report is being filed with the BCUC only under separate cover.

For further information, please contact Geoff Higgins at 604-623-4121 or by email at bchydroregulatorygroup@bchydro.com.

Yours sincerely,



Fred James
Chief Regulatory Officer

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Enclosure (1)

Site C Clean Energy Project

Quarterly Progress Report No. 16

F2020 First Quarter

April 2019 to June 2019

PUBLIC

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1 **Project Status – April to June 2019**

2 This Quarterly Progress Report No. 16 (**Report No. 16**) provides information
3 concerning the Site C Clean Energy Project (**Project**) covering the period from
4 April 1, 2019 to June 30, 2019.

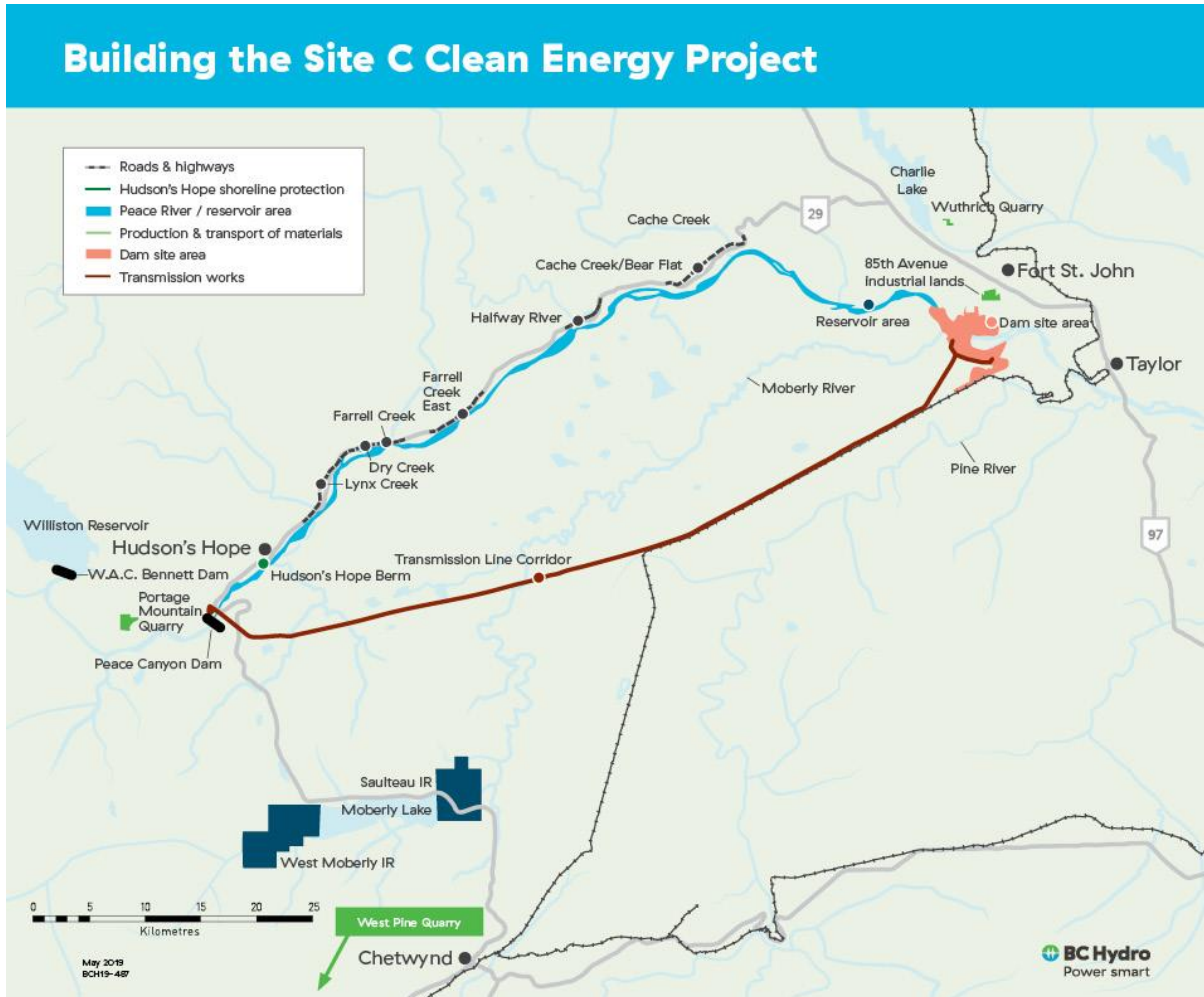
5 **1.1 Overview and General Project Status**

6 Construction began on July 27, 2015 and is ongoing. Since the commencement of
7 construction, the following work has been completed:

- 8 • Site preparation, including on-site access roads;
- 9 • Clearing of the left and right banks at the dam site is substantially complete and
10 clearing of the lower reservoir area is complete;
- 11 • Left bank cofferdams;
- 12 • Construction of the original worker accommodation lodge and Peace River
13 construction bridge;
- 14 • Powerhouse excavation, and placement of 414,000 cubic metres (m³) of
15 roller-compacted concrete in the powerhouse buttress;
- 16 • Construction of dam site access public road;
- 17 • Construction of the Site C viewpoint;
- 18 • Excavation of the diversion tunnel inlet (upstream) and outlet (downstream)
19 portals, allowing for the commencement of diversion tunnel excavations;
- 20 • Excavation of the right bank drainage tunnel, which will be used to monitor and
21 drain the remaining excavations for the spillway and dam buttresses and will
22 eventually be connected to services within the powerhouse;
- 23 • Breakthrough on the excavation of the first of two river diversion tunnels, which
24 will be used to temporarily reroute a short section of the Peace River to allow

- 1 for the construction of the earthfill dam. Subsequent to the reporting period,
 2 breakthrough on the longer second tunnel occurred; and
 3 • Clearing activities in the lower reservoir.

4 **Figure 1 Site C Project Components**



- 5 Significant Project updates that occurred between April 1, 2019 and June 30, 2019,
 6 include:
 7 • In April 2019, the first penstock segment arrived on site.

-
- 1 • The balance of plant request for proposals was issued on April 30, 2019. Refer
2 to section [1.2.1.3](#) for further information.
- 3 • The first truss (roof structure) was installed in the main service bay in
4 April 2019.
- 5 • Spillway excavation on the right bank was completed in April 2019.
6 Approximately 465,000 cubic metres of materials have been removed from this
7 area since fall 2018. Refer to section [1.2.1.1](#) for more information. In May 2019,
8 roller-compacted concrete placements began on the spillway area on the right
9 bank. Approximately 600,000 cubic metres of roller-compacted concrete are
10 scheduled to be placed in this area before the end of 2019. Refer to
11 section [1.2.1.1](#) for more information.
- 12 • In April 2019, eight local Indigenous students completed the BC Hydro and
13 Northern Lights College pre-carpentry skills pilot program, which was created to
14 provide Indigenous candidates the necessary skills to pursue carpentry
15 employment opportunities at Site C. Refer to section [1.8.3](#) for more information.
- 16 • Work resumed on Highway 29 in the Cache Creek West segment in May 2019.
17 Refer to section [1.2.1.6](#) for more information.
- 18 • In May 2019, the Site C community relations team in Fort St. John responded to
19 the 10,000th public enquiry since construction began in July 2015. Refer to
20 section [1.9.2.1](#) for more information.
- 21 • The alternating current (**AC**) station service (powerhouse/spillway power supply
22 system) and the generator circuit breaker equipment supply contracts were
23 awarded in May 2019 and June 2019 respectively. Refer to sections [1.2.1.3](#)
24 and [1.10.1](#) for further information.
- 25 • In early June 2019, BC Hydro held a community open house in Hudson's Hope
26 to provide an update on Site C construction, as well as plans underway to help

1 mitigate the impacts related to the project. Refer to section [1.9.2.1](#) for more
2 information.

- 3 • The June 2019 employment statistics showed there were 4,634 people working
4 on the Project (76 per cent of those from British Columbia). This is the highest
5 workforce number on the Project to date. For more information, refer to
6 section [1.8.2](#).
- 7 • In late June 2019, the Site C project completed the successful breakthrough on
8 the excavation of the first of two river diversion tunnels. Subsequent to the
9 reporting period, breakthrough on the longer second tunnel occurred in
10 July 2019. The achievement of this milestone reduces the uncertainty related to
11 the geological conditions around the tunnels. For more information, refer to
12 section [1.2.1.1](#).
- 13 • The powerhouse bridge cranes were erected in the main service bay in
14 June 2019. Refer to section [1.2.1.2](#) for more information.
- 15 • In June 2019, nine local non-profit organizations received a combined \$65,000
16 in funding from the Generate Opportunities (**GO**) Fund. The \$800,000 fund
17 supports community-enriching services in the Peace Region. This was the
18 tenth time funds were distributed.

19 These, and other, project updates are detailed in Report No 16. [Table 1](#) provides a
20 dashboard based on the Project's status as of June 30, 2019.

1
2

Table 1 Project Status Dashboard

● On Target ● Moderate Issues ● At Risk

Status as of:		June 2019
Overall Project Health	●	Overall project health remains amber. At June 30, 2019, the project remains on schedule and on budget. Safety issues and cost pressures continue to be monitored. The overall environmental status has improved over the last quarter.
Scope	●	Scope changes have been minimal and the changes are expected to be managed within contingency.
Schedule	●	The Project continues to be on track for river diversion (September 2020) and for the overall in-service date of 2024.
Cost	●	At June 30, 2019, the Project is forecast to be completed under the project budget of \$10.7 billion, which includes drawing on the Treasury Board Reserve. This forecast is based on BC Hydro's standard project delivery methodology which uses a P50 confidence level as the basis for preparing a forecast. The project budget was approved by the board of directors in February 2018. Cost pressures continue to be identified, assessed, and monitored.
Regulatory, Permits and Tenures	●	Permits are on track and are meeting schedule requirements. To date, the Project has obtained 70 per cent of its major required authorizations and the remaining authorizations are anticipated to be received as required to meet the overall project schedule needs. Environmental assessment certificate amendment approvals are progressing, with all requested amendments approved to date.
Environment	●	BC Hydro and contractors have substantially completed the main care-of-water features within the dam site and are further developing the care-of-water features along the till conveyor corridor as well as within Highway 29 works. Spring wildlife sweeps have been substantially completed and, overall, contractors and sub-contractors are complying with the Construction Environmental Management Plan. Updates to the Construction Environmental Management Plan to reflect operational needs are underway and being discussed with provincial and federal regulators.
Procurement	●	The proponents that have been selected to participate in the request for proposals for the balance of plant contract were approved by the Board in November 2018.
Indigenous Relations	●	Six of 10 agreements are fully executed and in implementation. Confidential discussions between the Province of British Columbia, BC Hydro, West Moberly First Nations and Prophet River First Nation to seek alternatives to litigation related to the Site C Project started in February 2019. Subsequent to the reporting period, West Moberly First Nations withdrew from the discussions in August 2019.

Status as of:		June 2019
Litigation	●	The treaty infringement claims filed by West Moberly First Nations and Prophet River First Nation in January 2018 remain active. The trial of these claims is expected to occur sometime in 2022. In February 2019, the Province of British Columbia, BC Hydro, West Moberly First Nations and Prophet River First Nation agreed to enter into confidential discussions to seek alternatives to litigation related to Site C. Subsequent to the reporting period, West Moberly First Nations withdrew from the discussions in August 2019. Discussions with Prophet River First Nation remain open.
Safety	●	This quarter saw the start of a busy summer construction work period with many new and concurrent work-fronts, and over 4,000 personnel on the project. As a result, the project saw an increase in the number of safety incidents and injuries, most involving strains and sprains. The frequency rate of serious incidents (based on work hours) has not increased significantly and Site C safety metrics continue to outperform WorkSafeBC benchmarks in the Major Construction and Forestry industries.
Stakeholder Engagement	●	BC Hydro continues to work with the communities, regional district and stakeholder groups on the implementation of various community agreements.
Quality	●	Overall, quality is tracking well across the project. BC Hydro continues to work with each contractor to identify and resolve nonconformities and quality issues as they arise. The project team placed additional focus on the generating station and spillways civil works contractor's curing and thermal control of concrete and continues to monitor this closely. BC Hydro continues to implement the recommendations from the Project quality assessment performed in the previous reporting period, including the commencement of regular quality audits at the site of both the main civil works and generating station and spillways civil works contractors.

1 **1.2 Major Accomplishments, Work Completed, Key Decisions and**
2 **Key Issues**

3 **1.2.1 Construction**

4 Refer to [Appendix F](#) for the high level construction schedule.

5 **1.2.1.1 Main Civil Works**

6 The scope of the main civil works contract includes the construction of the following
7 major components:

- 8 • Diversion works, including two 10.8 metre diameter, concrete-lined tunnels.
9 Tunnel No. 1 is 700 metres in length and tunnel No. 2 is 790 metres in length;
- 10 • Inlet and outlet portals;

-
- 1 • Excavation and bank stabilization (approximately 26 million cubic metres of
2 overburden and rock excavation);
 - 3 • Relocation of surplus excavated material (including management of
4 discharges);
 - 5 • Dams and cofferdams (including a zoned earth embankment 1,050 metres long
6 and 60 metres above the present riverbed and stage 1 and 2 cofferdams);
 - 7 • Roller-compacted concrete (including a buttress approximately 800 metres long
8 made up of two million cubic metres of concrete); and
 - 9 • Haul roads.

10 Construction progress is currently split between work on the left bank and right bank.
11 Main civil works is on track to meet river diversion in September 2020 and the dam
12 in-service milestone in July 2023.

13 ***Left Bank***

14 Work activities on the left bank are to stabilize the slope with a mass excavation,
15 stabilize the diversion inlet and outlet portals and excavate two diversion tunnels in
16 preparation for river diversion and construction of the earthfill dam.

17 The activities currently underway or completed on the left bank during this reporting
18 period include:

- 19 • Completion of the successful breakthrough on the excavation of the first of two
20 river diversion tunnels. Work on the diversion tunneling began in August 2018.
21 Due to early challenges, BC Hydro worked with the contractor to mitigate
22 schedule risks, enabling the successful breakthrough on the excavation of
23 tunnel 1 in June 2019; breakthrough on the longer tunnel 2 heading occurred
24 subsequent to the reporting period, in July 2019. The achievement of this
25 milestone reduces the uncertainty related to the geological conditions around
26 the tunnels. Continued excavation is underway of the lower portions of both

1 tunnels and is on track to be completed by the end of 2019. BC Hydro
2 continues to target achievement of the key construction diversion milestone on
3 March 1, 2020;

4 • The lining of tunnel 1 is underway with the first two concrete pours completed in
5 June 2019, and the lining of tunnel 2 is following. The tunnel 2 inlet structure
6 concrete placements started in June 2019, and the inlet and outlet structures
7 are forecast to be completed by the end of 2019 in support of gate installation
8 and dry testing by March 2020;

9 • Preparation on the left bank dam core excavation has started but is tracking
10 behind schedule. BC Hydro is working with the contractor to identify options to
11 improve the 2019 excavation schedule to support till placements in 2019.
12 Foundation grout trials are expected to be completed by the end of
13 August 2019; and

14 • The till conveyor system construction is progressing with foundations completed
15 and structure installation underway. The schedule to place the conveyor into
16 operation is at risk due to a WorkSafeBC permitting delay, wildlife nesting
17 concerns, productivity issues and weather impacts.

18 ***Right Bank***

19 The right bank scope of work includes the excavation of the powerhouse, spillways
20 and dam, and placing roller-compacted concrete for the foundations to support the
21 powerhouse, dam and spillway structures.

22 The activities currently underway or completed on the right bank during this reporting
23 period include:

24 • The last blast to complete the second phase of the spillway buttress slope
25 excavation was completed in April 2019 and roller-compacted concrete
26 placements started in May 2019. The plan for 2019 is to place approximately

1 600,000 cubic metres of roller-compacted concrete, which will be the largest
2 roller-compacted concrete season of the project;

- 3 • With the completion of the spillway excavation, the right bank dam core trench
4 and dam buttress excavations started in May 2019 and are expected to be
5 complete by the end of 2019. Roller-compacted concrete for the dam buttress is
6 to commence in spring 2020 and is expected to be complete in fall 2020; and
- 7 • Approximately 60 per cent of the aggregates required for 2019 roller-compacted
8 concrete placement have been produced. Aggregate supply is currently in full
9 production and it is expected that production needs for roller-compacted
10 concrete aggregate will be met in 2019.

11 ***In-River Work***

12 After the river is diverted in 2020, upstream and downstream cofferdams will be
13 constructed in the Peace River to provide safe access for the main dam
14 construction. The current in-river work includes dredging in support of the stage 1
15 cofferdams.

16 ***Earthfill Dam***

17 Work on the earthfill dam commenced in October 2018 and initial material
18 placements for the earthfill dam will continue through 2019. Foundation preparation
19 has commenced with core trench excavation and grout trials underway. While the
20 left bank core excavation and till conveyor schedules are at risk, BC Hydro expects
21 to meet the key earthfill dam construction milestone of July 2023 for reservoir filling.

22 **1.2.1.2 *Generating Station and Spillways***

23 The generating station and spillways scope of work includes the construction of the
24 following major components:

- 25 • Generating station and spillways civil work includes:
 - 26 ▶ Concrete, steel, installing cranes, and installing gates for the powerhouse;

- 1 ▶ Concrete, penstocks, and installing gates for the inlet headworks; and
- 2 ▶ Concrete and installing gates for the spillways;
- 3 • Cranes which includes the supply and commissioning of the powerhouse
- 4 cranes, tailrace gantry crane, and headworks gantry crane; and
- 5 • Hydromechanical equipment, including the supply of all gates.

6 ***Generating Station and Spillways Civil Work***

7 As of June 26, 2019, the generating station and spillways contractor had placed a
8 cumulative total of 49,100 cubic metres of concrete for the powerhouse compared to
9 a plan of 50,900 cubic metres.

10 Concrete placements for the powerhouse are being completed on Units 1, 2, 3,
11 and 5. Concrete and structural steel in the main service bay are complete.

12 The generating station and spillways contractor had placed a cumulative total of
13 3,800 cubic metres of concrete for the intake headworks to June 26, 2019,
14 compared to a plan of 4,700 cubic metres.

15 Concrete placements for the intake headworks are being completed on
16 Units 1 and 3.

17 ***Cranes***

18 Powerhouse cranes were installed in the main service bay in June 2019. These are
19 vital components in the Site C generating station and, with a lifting capacity of
20 320 tonnes, can lift the heaviest equipment in the powerhouse, including the major
21 components of the turbine and generator units. The cranes are scheduled to be
22 commissioned and operational by October 2019.

23 ***Hydromechanical Equipment***

24 Gates guides for the draft tube maintenance gates are proceeding ahead of
25 schedule.

1 **1.2.1.3 Balance of Plant**

2 The formal procurement process for the generating station and spillways balance of
3 plant contract was launched in June 2018. The request for proposals for the balance
4 of plant contract was issued to three shortlisted proponents on April 30, 2019. Over
5 the coming months, the three teams will continue to visit the site and participate in
6 collaborative meetings to facilitate developing their competitive proposal. Proposals
7 will be received in 2020 with a target award date of June 2020 and mobilization set
8 for September 2020. The AC station service and the generator circuit breaker
9 equipment supply contracts were awarded in May 2019 and June 2019 respectively.

10 **1.2.1.4 Turbines and Generators**

11 The scope of the work includes the complete design, supply, installation, testing and
12 commissioning of six turbines, generators, governors and exciters. All progress for
13 design, procurement and manufacturing for the turbines and generators is on
14 schedule.

15 The contractor continues the assembly and welding of embedded turbine
16 components in its temporary manufacturing facility on the right bank at site. The
17 contractor's São Paulo factory will supply the majority of the turbine generator
18 components, and has produced all cast steel parts for four of the six turbines. Initial
19 meetings for the various other turbine and generator components in the São Paulo
20 factory have been held concurrently with visits to most of the contractor's
21 subcontractors in the São Paulo area. Based on the powerhouse construction
22 schedule, the contractor will commence turbine installation in the powerhouse by
23 July 2020. Current areas of focus include ensuring quality of the manufactured
24 components and that contract specifications and schedule are met.

25 Pre-production stator bars for the generators were shipped in March 2019 from the
26 contractor's São Paulo facility to BC Hydro's subsidiary, Powertech Labs, for type
27 testing. The test results confirmed the design will meet contractual requirements.

1 **1.2.1.5 Transmission and Substation**

2 The transmission sub-project will connect the Site C Project to the BC Hydro
3 transmission system. The scope of work includes the following major components:

- 4 • A new 500 kV Site C substation;
- 5 • Two 75-kilometre long, 500 kV transmission lines from the Site C substation to
6 the Peace Canyon generating station;
- 7 • Three, one-kilometre long, 500 kV transmission lines from the Site C generating
8 Station to the Site C substation; and
- 9 • Expansion of the existing Peace Canyon 500 kV gas-insulated switchgear to
10 incorporate the two new 500 kV transmission line terminals.

11 **Transmission**

12 The transmission line contractor remobilized to site during the reporting period and
13 continued to install helical pile foundations and assemble lattice towers; this was part
14 of the plan to get back on schedule by fall 2019 due to a pause in work in
15 March 2019, which was a result of road access restrictions during the spring break
16 up period. The transmission line contractor received the final deliveries of lattice
17 tower steel and overhead conductor from the suppliers.

18 Construction of access roads on the western half of the transmission right-of-way
19 started in May 2019, two months ahead of schedule.

20 **Substation**

21 Substation construction continued between April and June 2019, including the
22 construction of concrete foundations and the installation of cable trenches and
23 protection and control wiring to connect the 500 kV equipment to the control building.
24 The substation contractor completed the installation of the telecommunication
25 system (steel tower, microwave antenna and waveguide and telecommunications
26 panels), meeting a contract milestone. Substation construction remains on schedule.

1 ***Peace Canyon Gas-Insulated Switchgear Expansion***

2 The gas-insulated switchgear design-build contractor continued installation of the
3 gas-insulated switchgear equipment during an outage at Peace Canyon, which
4 started in April 2019 and ended in July 2019. The indoor portion of the Peace
5 Canyon gas-insulated switchgear expansion was placed into service in July 2019,
6 subsequent to the reporting period.

7 **1.2.1.6 Highway 29 and Hudson's Hope Shoreline Protection Berm**

8 The creation of the Site C reservoir requires realignment of segments of Highway 29
9 totalling approximately 30 kilometres. The scope of the highway realignment also
10 entails relocation of existing 25 kV distribution lines along the existing highway and
11 construction of a slope protection berm at the District of Hudson's Hope to protect
12 against bank erosion due to reservoir wind waves and water table rise. The
13 permanent realignment is planned to be completed by spring 2023 in order for the
14 highway to remain accessible once the reservoir is created and the dam is
15 operational.

16 The Highway 29 and Hudson's Hope Shoreline Protection Berm realignment is
17 divided into the following main areas:

- 18 • Cache Creek (Cache Creek East and Cache Creek West);
- 19 • Halfway River;
- 20 • Western segments (Farrell Creek East, Farrell Creek, Dry Creek, Lynx Creek);
21 and
- 22 • Portage Mountain Quarry and Hudson's Hope shoreline protection.

1 **Cache Creek**

2 **Cache Creek East**

3 The design for the revised realignment option continues to progress and is expected
4 to be completed in late 2019. The design in support of a tender for the construction
5 of an embankment fill is expected to be completed in July 2019, for a tender issue in
6 August 2019. A request to amend the Project's Environmental Assessment
7 Certificate to reflect the revised realignment was submitted to the Environmental
8 Assessment Office in May 2019.

9 **Cache Creek West**

10 Construction of the four kilometre highway realignment at Cache Creek West
11 resumed in May 2019 after shutting down for winter conditions. The construction
12 activities for this initial partial scope of work was completed in spring 2019.
13 Construction of this segment is expected to be complete on schedule in
14 summer 2020.

15 **Halfway River**

16 The design for the Halfway River bridge tender was completed in June 2019, and
17 the tender package issued to the Ministry of Transportation and Infrastructure to
18 include in their tender documents. The tender was issued by the Ministry of
19 Transportation and Infrastructure in early July 2019.

20 The stripping and data recovery of archeological site materials was awarded to a
21 First Nations contractor and work began in June 2019.

22 **Western Segments**

23 Functional design work for Farrell Creek was completed in April 2019. Functional
24 design for Dry Creek and Lynx Creek continued and is planned to be completed in
25 summer 2019.

26 The property acquisition process will continue for the western segments.

1 ***Portage Mountain Quarry and Hudson's Hope shoreline protection berm***

2 The Portage Mountain quarry is being developed to supply rip rap materials for
3 sections of Highway 29 realignment and construction of the shoreline protection
4 berm for the District of Hudson's Hope. Construction and development of the quarry
5 continued during this reporting period, including construction of a haul road and
6 stockpiling area. A permit was submitted to the Ministry of Energy, Mines and
7 Petroleum Resources for the operation of the quarry.

8 A public meeting was held in the town of Hudson's Hope to provide an update on the
9 Hudson's Hope Shoreline Protection. Engineering design of the shoreline protection
10 is in progress and is expected to be complete in fall 2019.

11 ***1.2.1.7 Reservoir Clearing***

12 The remaining reservoir clearing scope of work is divided into two main areas:

- 13 • Moberly River drainage, eastern reservoir including Cache Creek drainage; and
14 • Middle reservoir, Halfway River drainage and western reservoir.

15 Clearing in the Moberly River drainage, eastern reservoir and middle reservoir is
16 required to support river diversion in fall 2020. All other clearing is scheduled for
17 completion by spring 2023 (prior to reservoir inundation).

18 ***Moberly River Drainage, Eastern Reservoir including Cache Creek Drainage***

19 Clearing occurred in the Moberly River drainage, eastern reservoir and Cache Creek
20 area over the 2018/2019 winter. All clearing was completed in these areas except for
21 some floodplain debris removal and some trees on steep slopes in the Moberly River
22 drainage and the left bank of the eastern reservoir. Wood waste disposal and any
23 remaining clearing is planned for fall/winter 2019.

1 Procurement for the clearing of the right bank portion of the eastern reservoir began
2 in May 2019 and the road portion of the access and clearing work was awarded in
3 June 2019, with works scheduled to start in July 2019.

4 ***Middle Reservoir including Halfway River Drainage and Western Reservoir***

5 Designs for the middle reservoir including Halfway River drainage and western
6 reservoir are ongoing. Procurement on the first contract package for the middle
7 reservoir was initiated in May 2019 and is anticipated to be awarded in August 2019.
8 Access and clearing for the middle reservoir is scheduled to start in summer 2019
9 and will progress westward in future clearing seasons.

10 **1.2.2 Engineering**

11 The Engineering team provides technical support across the Site C project, with
12 substantial focus this reporting period on supporting the achievement of the Project
13 and contractors' schedule for both the main civil works contract and the generating
14 station and spillways civil works contract.

15 ***Main Civil Works***

16 For the main civil works contract, the main focus areas for the engineering team
17 during the reporting period were the advancement of the river diversion schedule
18 and completion of engineering designs and proposed contractors' changes for the
19 left bank excavation permanent drainage, spillway buttress roller-compacted
20 concrete slope protection and concrete outline drawings, right bank dam buttress
21 slope protection, the left bank dam core trench excavation and slope protection
22 sequencing, and the consolidation and curtain grouting mix design. Engineering also
23 provides ongoing support to construction through constructability, schedule and
24 engineering reviews for the sequencing and scheduling of the spillway buttress
25 excavation and roller-compacted concrete placements for the handover to the
26 generating station and spillways civil works contractor.

1 ***Large Cranes, Hydromechanical, Turbines and Generators***

2 Engineering support to construction and vendor integration has been ongoing
3 throughout the reporting period for the large cranes, hydromechanical equipment
4 and turbines contracts. The two powerhouse bridge cranes have been successfully
5 erected onto the crane rails in the powerhouse. The contractor has also commenced
6 detailed design and material procurement activities for the headworks gantry crane.

7 The hydromechanical equipment specifications and the gantry crane design basis
8 memorandum continued to be advanced.

9 ***Generating Station and Spillways, Balance of Plant and Equipment Supply***

10 Several batches of construction drawings for the generating station and spillways
11 civil works contract were completed through the reporting period, in support of, and
12 in accordance with, the revised contractors schedule for the release of remaining
13 construction drawings.

14 The implementation design for the balance of plant and equipment supply packages
15 for the generating station and spillways have been advancing including
16 specifications and REVIT modelling work. A first draft of the technical schedule was
17 issued to the balance of plant proponents in May 2019, comprised of approximately
18 120 specifications and 700 drawings. A balance of plant proponent site visit also
19 took place in June 2019.

20 Design continued to advance on the protection and control systems and is on
21 schedule.

22 ***Transmission and Substation***

23 Implementation design was completed for upgrades of telecommunications facilities
24 to support energization of the substation and transmission lines. Detailed design of
25 the final transmission towers for the 500KV powerhouse transmission lines is in
26 progress.

1 **Highway 29**

2 Advancement of the implementation design for Highway 29 and associated bridge
3 structures continues in accordance with the Project schedule requirements.
4 Geotechnical investigations were completed to confirm subsurface conditions and
5 aggregate sources for the upstream segments of Highway 29. A tender package
6 was issued for Halfway River by the Ministry of Transportation and Infrastructure in
7 July 2019. Design and procurement packages are being prepared to support early
8 works construction at Cache Creek and Lynx Creek, in support of construction
9 expected to start in fall 2019.

10 **Technical Advisory Board**

11 A Technical Advisory Board meeting was held from May 28, 2019 to May 31, 2019 in
12 Fort St. John and Vancouver. The Technical Advisory Board was provided with a
13 project update and a variety of technical and other issues were discussed.

14 A workshop with the Technical Advisory Board will be held from September 12, 2019
15 to September 13, 2019 in Fort St. John and the next formal meeting is planned for
16 January 2020 in Fort St. John and Vancouver.

17 **1.2.3 Quality Management**

18 The Project has a quality management plan that outlines activities to ensure
19 materials, equipment and the constructed works meet contract quality requirements.
20 The plan identifies resources and procedures necessary for achieving the quality
21 objectives, roles and responsibilities, resource planning and establishment of a
22 quality management program.

23 Implementation and monitoring of quality control and quality assurance plans are a
24 requirement for all contractors. The Project tracks and manages quality
25 nonconformities, defined as an occurrence that does not conform to the quality
26 requirements of the contract. [Table 2](#) identifies quality management nonconformity
27 instances occurring during the reporting period

1
2
3

**Table 2 Quality Management Nonconformity
 Report Metrics Reporting Period –
 April 2019 to June 2019**

Contract	April 1, 2019 to June 30, 2019		Cumulative to Date		Open as of June 30, 2019
	Reported	Closed	Reported	Closed	
Main Civil Works	57	46	1,181	1,134	47
Turbines and Generators	18	1	54	23	31
Generating Station and Spillways Civil Works	86	47	182	105	77
Large Cranes	0	1	10	10	0
Hydromechanical Equipment	1	0	1	0	1
Transmission	10	5	73	62	11

4 The quality performance of the main civil works contractor was assessed as good for
 5 the reporting period. BC Hydro and the contractor continue to meet on a weekly
 6 basis to discuss and resolve quality issues, and quality steering committee meetings
 7 continue to be held monthly to discuss broader topics related to the contractor’s
 8 quality performance. The main civil works contractor continues to maintain its
 9 staffing targets for quality control personnel at the site to support the multiple work
 10 fronts in the 2019 construction season. Offsite manufacturing of the diversion gates
 11 and embedded parts continues to proceed without any major quality issues.

12 The quality performance of the turbines and generators contractor was assessed as
 13 good for the reporting period. BC Hydro and the contractor continue to meet on a
 14 weekly basis to discuss and resolve quality issues. The increase in nonconformities
 15 reported is attributed to the increase in runner blade and wicket gate casting
 16 activities in the contractor’s foundry. It should be noted that based upon both the
 17 contractor’s and BC Hydro’s past experiences, this is not unusual. BC Hydro now
 18 has two local surveillance inspectors employed full time at the contractor’s São
 19 Paulo manufacturing facility, and expects to employ an additional resource as the
 20 manufacturing moves towards three key high-volume activities: runner welding,
 21 stator bar manufacturing and stator core lamination manufacturing.

1 The quality performance of the generating station and spillways civil works
2 contractor was assessed as generally good for the reporting period. However,
3 multiple nonconformities were identified related to curing and thermal control of
4 concrete in the powerhouse Units 1 and 3 draft tube placements. In response,
5 BC Hydro and the contractor instituted a joint-inspection of placed concrete to
6 ensure that the accepted procedures were being adhered to and to immediately
7 address any observed nonconformities. The performance of the contractor, as it
8 relates to curing and thermal control of concrete, has significantly improved as a
9 result of these joint inspections. BC Hydro and the contractor are in the process of
10 closing out the nonconformity dispositions, and none of the nonconformities are
11 expected to impact the Project schedule or the performance of the structures. Offsite
12 manufacturing of penstocks and trashracks is proceeding without any major quality
13 issues.

14 The quality performance of the transmission contractors was assessed as good for
15 the quarter ending June 30, 2019. BC Hydro continues to perform quality
16 surveillance audits of the transmission contractors to verify that their quality
17 management systems are being adhered to.

18 Updates to the Project quality plan and the quality sections of the resident
19 engineering plan have been completed and the revised plans were issued in April
20 and June 2019 respectively.

21 BC Hydro has started performing quality audits of the main civil works and
22 generating station and spillways civil works contractors. The audits are performed
23 every four to six weeks and are focused on the contractor's construction operations
24 and supporting processes. Audits to date have included: storage and preservation of
25 materials, non-conformance reporting, aggregate production and roller-compacted
26 concrete operations.

1.3 Safety and Security

This reporting period saw the start of a busy summer construction work period with many new and concurrent work-fronts, and over 4,000 workers on the Project. Focusing on the safe completion of work remains a top priority for the Project's safety and construction teams.

Almost 60 per cent of the injuries experienced since the initial start of the construction season in April 2019 have involved muscular-skeletal sprains and strains; primarily from trips and falls, contusions, cuts from hand tools, overexertion, repetitive motion, and lifting and pulling. As a result, discussion of muscular-skeletal injury root causes and mitigation strategies was a key agenda item at recent Joint Safety Steering Committee meetings. The steering committee includes safety and construction representatives from BC Hydro and the Prime Contractors.

A new safety initiative implemented this reporting period is the addition of independent specialists to complete safety-oriented technical assessments of higher risk equipment and plant, operating across the site. An assessment of the chiller plants operated by two major contractors was completed this quarter. The assessment found the chiller plants have been installed and are operating according to manufacturer's instructions, and provided continuous improvement recommendations for ongoing inspection and maintenance. A similar assessment is planned for the newly constructed till conveyors next quarter.

Summary of Safety and Regulatory Performance Metrics

With the increase of work fronts and workers on the Project, there is an increase in the number of safety incidents and injuries reported; however, the Serious Safety Incident Frequency (based on work hours) has significantly decreased compared to the same reporting period last fiscal year ([Table 2](#)). The Site C Safety Team expects continued higher volume of safety related incidents for the rest of the construction season.

1 [Table 3](#) below reflects safety and regulatory performance results for the Project
 2 including all contractors. The table summarizes results in a tabular format, and more
 3 details are included following the table.

4 **Table 3 Summary of Site C Safety and Regulatory**
 5 **Metrics**

	Reported April 1, 2019 to June 30, 2019 ¹	Reported Since Inception (July 27, 2015 to June 30, 2019) ¹
Fatality ²	0	0
Permanently Disabling Injury ³	0	1 ⁴
Serious Incidents ⁵	5	41
Lost Time Injuries ⁶	1	21
All-Injury Incidents ⁷ (Lost Time Injuries ⁶ and Medical Attention requiring Treatment ⁸)	12	94
Regulatory Inspections	9	93
Regulatory Orders	15	167

6 During this reporting period, the Project experienced five serious incidents, and
 7 12 all injury incidents that included one lost time injury and eleven medical attention
 8 requiring treatment incidents.

1 Numbers are subject to change due to timing of when data is retrieved and when injury is categorized.

2 Excludes health events unrelated to work standards.

3 A permanently disabling injury is one in which someone suffers a probable permanent disability.

4 In June 2018, an injured worker received a permanent partial disability award from WorkSafeBC due to a lost time injury incident in August 2017. The worker was attempting to unload a light plant (tower) from a flatbed truck. The worker stepped on the light plant (tower) outrigger to gain enough height to reach the lifting attachment when the worker lost balance and fell approximately 7.5 feet to the ground. BC Hydro reclassified this incident as a permanent disabling injury after receiving an update on the WorkSafeBC award in June 2018. The incident is identified as a serious injury in the BC Hydro Incident Management System.

5 Serious incidents are any injury or near miss with a potential for a fatality or serious injury.

6 Lost time injuries are those where a worker (employee or contractor) misses their next shift (or any subsequent shift) due to a work-related injury / illness. If a worker only misses work on the day of the injury, it is not considered a lost time injury.

7 All Injury incidents is a count of all work-related fatalities, lost time injuries and medical attention requiring treatment.

8 Medical attention requiring treatment is where a medical practitioner has rendered services beyond the level defined as “diagnostic or first aid” and the worker (employee or contractor) was not absent from work after the day of the injury. Services beyond diagnostic / first aid include (but are not limited to) receiving stitches, a prescription, or any treatment plan such as physiotherapy or chiropractic.

1 The Project to date has experienced 41 serious incidents, which include 27 near
2 misses and 14 injuries with the potential to be serious.

3 ***Serious Safety Incidents***

4 The five serious incidents that occurred during this reporting period include:

- 5 1. A worker's fall arrest lanyard was attached to a formwork that shifted. The
6 worker immediately unhooked their lanyard and climbed off of the formwork;
- 7 2. A worker was travelling down on a steep path in rugged terrain when they
8 turned to speak to another worker, lost their footing, fell, and sustained a
9 fracture;
- 10 3. A loader's rear tire failed due to contact with the catwalk and metal apron on a
11 Roadheader. The sudden release of air from the ruptured tire caused a worker
12 to suffer a brief loss of consciousness;
- 13 4. Sloughing of material from the spillway buttress excavation slope struck a
14 worker and carried them down the slope for approximately 2.5 meters; and
- 15 5. While inspecting cables on a tower crane, a worker was struck by a pin
16 assembly that fell from approximately 51 meters above.

17 ***All Injury Incidents***

18 The 12 injury incidents that occurred during this reporting period include:

19 **Lost Time injury**

- 20 1. A worker was travelling down a step path in rugged terrain when they turned to
21 speak to another worker, lost their footing, fell, and sustained a fracture.

22 **Medical Attention requiring Treatment**

- 23 1. A worker, wearing gloves, was using a box cutter to cut tape and received a
24 laceration that required stitches;

- 1 2. A loader's rear tire failed due to contact with the catwalk and metal apron on a
2 roadheader. The sudden release of air from the ruptured tire caused a worker
3 to suffer a brief loss of consciousness;
- 4 3. A worker was widening a hole in a girder when the drill bit caught; torque from
5 the drill resulted in the worker sustaining a fracture;
- 6 4. A worker using a palm drill sustained a puncture that required staples;
- 7 5. A worker was cutting steel with an oxyacetylene torch when a piece of metal fell
8 off the table, struck the worker, resulting in a fracture;
- 9 6. A worker was cutting a piece of rope. The knife blade went through the rope
10 then cut through the worker's leather glove, causing a laceration that required
11 stitches.
- 12 7. A worker stepping over a pile of rebar, lost their footing and received a
13 laceration that required stitches;
- 14 8. A worker was pre-loading core tubing into a drill rod, when the tip of their right
15 thumb became pinched between the core tubing and drill rod and required
16 stitches;
- 17 9. A worker was drilling anchors for coil rod in-beds. The worker filled a hole with
18 epoxy, started to hammer a piece of coil rod into the hole, and hit an air pocket
19 causing the epoxy to splatter up under their safety glasses and make contact
20 with their eye.
- 21 10. A worker was cleaning construction debris out of water that had been used for
22 green-cutting concrete. Their hand showed signs of peeling from concrete
23 irritation.
- 24 11. A worker slipped at the end of a plywood access path; tried to catch themselves
25 and hit their arm on a horizontal rebar.

1 **Safety Performance Frequency Metrics**

2 To track safety performance over time, the Project considers the key safety metrics
 3 in context of the total amount of hours worked, thus providing a more calibrated view
 4 to account for the volume of work.

	Fiscal 2019 (Rolling 12-Month Average)				Fiscal 2020 (Rolling 12-Month Average)			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Serious Incident Frequency	0.95	0.56	0.44	0.36	0.43			
Lost Time Injury Frequency	0.48	0.43	0.40	0.29	0.17			
All Injury Frequency	1.67	1.47	1.25	1.01	0.97			

5 Fiscal 2020 Q2, Q3 and Q4 will be updated when information is available.

6 The serious incident frequency for this reporting period was 0.43, a significant
 7 decrease from 0.95 compared to the same reporting period last fiscal year. Lost time
 8 injury frequency for this reporting period was 0.17, down from 0.48 compared to the
 9 same reporting period last fiscal year. All injury frequency was 0.97 this reporting
 10 period compared to 1.67. These results suggest the site-wide safety focus during
 11 on-boarding of new hires and apprentices has gone well this construction season.
 12 BC Hydro will assess second quarter results before drawing any conclusions with
 13 respect to sustained changes in safety culture.

14 **Non-Serious Incidents**

15 During this reporting period, the Project reported 261 non-serious safety incidents
 16 which included six good catches, 88 near misses and 167 minor injuries that may
 17 have required first aid and/or medical treatment. A “near miss” is defined as an
 18 incident that could have resulted in an injury, but did not because of effective hazard
 19 barriers or the person was out of harm’s way/missed. BC Hydro considers near miss
 20 reporting as indicative of a stronger and improving safety culture, and is strongly
 21 encouraging all Site C contractors and employees to report near misses. The

1 BC Hydro safety team is also investing effort into a deeper analysis of Site C near
2 misses to identify and mitigate safety trends.

3 ***Safety Regulatory Inspections and Orders***

4 WorkSafeBC, under the authority of the *Worker's Compensation Act*, is the primary
5 safety regulator with jurisdiction over the Site C project. It oversees all worker safety
6 (employee and contractor) for Site C, both on the dam site and off the dam site. The
7 Ministry of Energy, Mines and Petroleum Resources has been involved in some
8 aspects of safety for the Site C project, specifically: West Pine Quarry, Portage
9 Mountain Quarry, and Wuthrich Quarry.

10 From April through June 2019, WorkSafeBC conducted eight inspections and issued
11 14 orders. The Ministry of Energy, Mines and Petroleum Resources conducted one
12 regulatory inspection and issued one order.

13 WorkSafeBC's primary focus this reporting period was on the material sloughing
14 incident on the Spillway Buttress Excavation slope. Others topics referenced in the
15 inspections and orders included supervisor responsibilities, appropriate use of
16 equipment, using equipment according to the manufacturer's instructions, fall
17 protection, signed and sealed design instructions available at the work site, and
18 exposure control plans.

19 Of the nine regulatory inspections that occurred during this reporting period, two
20 resulted in no orders or a 'clean sheet'. As of June 2019, the Project's rolling
21 12-month 'clean sheet' result was 27 per cent which is lower than BC Hydro overall,
22 and WorkSafeBC industry averages. To assess regulatory compliance performance,
23 Site C monitors an additional metric, average number of orders per regulatory
24 inspection, which helps account for the higher volume of regulatory inspections
25 expected at a large construction project like Site C. The average number of orders
26 per regulatory inspection this reporting period is 1.7, up from 1.3 in the same period
27 last fiscal year.

1 Refer to [Appendix B, Table B-1](#) for the details of the safety regulatory inspections
2 and orders that occurred during the reporting period.

3 **1.4 First Nations Consultation**

4 Pursuant to the Environmental Assessment Certificate and Federal Decision
5 Statement, BC Hydro is required to consult with 13 Indigenous groups with respect
6 to the construction stage of the Project. This consultation includes provision of
7 information on construction activities, support for the permit review process, and
8 review and implementation of mitigation, monitoring and management plans, and
9 permit conditions.

10 Accommodation offers were originally extended to ten First Nations communities.

11 Six agreements have been fully executed and are in various stages of
12 implementation. The Province of British Columbia, BC Hydro, West Moberly First
13 Nations and Prophet River First Nation have agreed to enter into confidential
14 discussions to seek alternatives to litigation related to the Site C Project.

15 Subsequent to the reporting period, West Moberly First Nations withdrew from the
16 discussions in August 2019. Discussions with Prophet River First Nation remain
17 open. To date, Impact Benefits Agreements with Doig River First Nation, Halfway
18 River First Nation, Sauteau First Nation and McLeod Lake Indian Band, and a
19 Project Agreement with Dene Tha' First Nation have been publicly announced, while
20 a Project Agreement with Duncan's First Nation has also been reached.

21 Consultation and engagement with Indigenous groups is ongoing through the
22 Cultural and Heritage Resources Committee, Environment Forum and Permitting
23 Forum. Engagement through these forums and directly with Indigenous groups to
24 prepare them for river diversion and reservoir inundation is ongoing and includes
25 numerous boat, highway and site tours.

1 **1.5 Litigation**

2 A number of legal challenges of the Project have been filed by First Nations and
3 other interests. In all cases where the courts have issued rulings, the legal
4 challenges have been dismissed.

5 The treaty infringement claims filed by West Moberly First Nations and Prophet River
6 First Nation in January 2018 remain active. West Moberly First Nations had
7 concurrently filed an injunction application in January 2018 to stop construction of
8 the Project, but the injunction was denied by the B.C Supreme Court. The trial of the
9 treaty infringement claims is expected to occur sometime in 2022.

10 In February 2019, the Province of British Columbia, BC Hydro, West Moberly First
11 Nations and Prophet River First Nation agreed to enter into confidential discussions
12 to seek alternatives to litigation related to Site C. As mentioned in [Table 1](#) and
13 section [1.4](#) of this report, subsequent to the reporting period, West Moberly First
14 Nations withdrew from the discussions in August 2019. Discussions with Prophet
15 River First Nation remain open.

16 The details of all open proceedings as of June 30, 2019 are summarized in [Table 4](#)
17 below.

1 **Table 4 Litigation Status Summary**

Description	Date
B.C. Supreme Court: Treaty Infringement Claims	
West Moberly First Nations Prophet River First Nation	Claims filed January 15, 2018
West Moberly First Nations	Injunction application filed Hearing date Injunction denied No appeal filed January 31, 2018 July 23 to August 3, 2018 and September 4 to 7, 2018 October 24, 2018
B.C. Supreme Court Civil Claims	
Building Trades v. BC Hydro	Civil claim filed Response to claim filed March 2, 2015 April 10, 2015
Aggregate Mining Process LLC and Reynolds Shipping LLC	Civil claim filed Response to claim filed Order granting security for BC Hydro's costs November 16, 2018 December 6, 2018 June 17, 2019
Office of the Information and Privacy Commissioner (OIPC)	
Applicant requested review of Freedom of Information response	Request for review filed OIPC Order issued Application for judicial review of Order filed Hearing date August 17, 2017 December 11, 2018 January 18, 2019 September 17, 2019 and October 4, 2019

2 **1.6 Permits and Government Agency Approvals**

3 **1.6.1 Background**

4 Before the Site C Project could start construction, an extensive environmental
 5 assessment process was undertaken that resulted in the issuance of the Provincial
 6 Environmental Assessment Certificate and the Federal Decision Statement in
 7 support of the Project. In addition, the Project is required to apply for multiple
 8 provincial permits, water licences, leaves to commence construction and federal
 9 authorizations. Timing of the application for these permits and authorizations is
 10 staged and aligned with the construction schedule, availability of detailed design
 11 information, and by project component. Permitting approaches and requirements are
 12 also determined through regular meetings with regulatory agencies, and are subject

1 to change throughout the Project. As at June 30, 2019, BC Hydro estimates that
2 approximately 444 permits will be required throughout the life of the Project. Of
3 these permits, 301 have been received and are actively being managed.

4 Multiple conditions are attached to each permit or authorization, which cover
5 subjects such as air quality, water quality, fish and aquatics, wildlife, heritage, health
6 and safety, construction environmental management and First Nations consultation.
7 Each of the conditions must be implemented, audited and tracked to prove
8 compliance or identify issues for follow-up with corrective actions. BC Hydro has
9 developed a comprehensive Construction Environmental Management Plan which
10 outlines how we will comply with the Project Environmental Assessment Certificate,
11 Federal Decision Statement, and provincial and federal permits and authorizations.
12 As of June 30, 2019, all required conditions and submissions have been met in
13 accordance with the schedule and requirements of the conditions.

14 **1.6.2 Federal Authorizations**

15 Federal authorizations are required under the *Fisheries Act* (Fisheries and Oceans
16 Canada) and the *Navigation Protection Act* (Transport Canada). All major federal
17 authorizations for construction and operation of the Site C dam and reservoir were
18 received in July 2016. At this time, no further *Fisheries Act* authorizations are
19 anticipated. Additional *Navigation Protection Act* approvals for discrete works in the
20 reservoir (e.g., shoreline works, debris booms and Highway 29 bridges) are
21 anticipated to be issued at the regional level. As of June 30, 2019, a total of
22 44 federal approvals have been received and are actively being managed.
23 Four approvals are pending, and 16 future approvals are planned.

24 **1.6.3 Provincial Permits**

25 Site C requires provincial permits primarily under the *Land Act*, *Water Sustainability*
26 *Act*, *Forest Act*, *Wildlife Act*, *Heritage Conservation Act*, and *Mines Act*. These
27 permits include investigative permits, licences to occupy land, water licence

1 approvals, leaves to commence construction and leaves to construct, and licences
2 to cut vegetation, among others. Permit applications are sequenced with the overall
3 schedule of the Project to ensure the most current and factual information is
4 included in the submissions.

5 Approximately 380 provincial permits and approvals will be required throughout the
6 life of the Project. As of June 30, 2019, 257 permits have been obtained and are
7 actively being managed. These include permits for the dam site area (site
8 preparation and clearing, as well as preliminary works for the main civil works and
9 generating station and spillways, such as construction of cofferdams, excavation and
10 construction of roller-compacted concrete buttress), worker accommodation (land
11 tenure and water withdrawal), Highway 29 geotechnical investigations, transmission
12 line clearing and construction of access roads, and lower/eastern reservoir and
13 Moberly River clearing. Future provincial permits are planned for the construction of
14 the Highway 29 realignment, Hudson's Hope Berm, and middle and western
15 reservoir clearing and filling. All future permits are anticipated to be issued in
16 accordance with the Project construction schedule.

17 The majority of the provincial permits are administered by the Ministry of Forests,
18 Lands, Natural Resource Operations and Rural Development and the Ministry of
19 Energy, Mines and Petroleum Resources. In addition, BC Hydro has developed a
20 coordinated First Nations consultation process with the Ministry of Forest, Lands,
21 Natural Resource Operations and Rural Development to assist with the government
22 permit workload. This coordinated consultation process was implemented in
23 January 2018.

24 **1.6.4 Environmental Assessment Certificate**

25 Compliance with the Project conditions in the Environmental Assessment Certificate
26 is regularly monitored, and evidence is collected by various federal and provincial

1 regulatory agencies, the Independent Environmental Monitor, BC Hydro and
2 contractors.

3 To date, the Environmental Assessment Office has issued four amendments to the
4 Project's Environmental Assessment Certificate. These are:

- 5 • Amendment No. 1 – Changes to Environmental Assessment Certificate
6 Schedule A, project description regarding design changes to the generating
7 station and spillways (issued June 22, 2018);
- 8 • Amendment No. 2 – Changes to Environmental Assessment Certificate
9 Schedule A, project description regarding design changes to the Halfway River
10 Bridge within the Halfway River Highway 29 realignment (issued
11 October 26, 2018);
- 12 • Amendment No. 3 – Changes to Environmental Assessment Certificate
13 Schedule A, project description regarding the use of West Pine Quarry, in
14 addition to the already approved Portage Mountain Quarry, as a source of
15 quarry and excavated material for the construction of the Highway 29
16 realignment, Hudson's Hope shoreline protection, and areas along the reservoir
17 requiring protection during reservoir filling (issued November 14, 2018); and
- 18 • Amendment #4 – Changes to Environmental Assessment Certificate
19 Schedule B, Condition Nos. 4 and 13 to permit the selective use of mechanical
20 clearing in riparian zones during reservoir clearing when it is unsafe to
21 undertake manual clearing (issued February 12, 2019).

22 All amendments and amendment requests are posted on the Environmental
23 Assessment Office website at

24 <https://projects.eao.gov.bc.ca/p/site-c-clean-energy/docs>.

1 As with any large construction project, refinements to the design are expected.
2 There are no material impacts to the cost of the Project as a result of the proposed
3 amendment requests.

4 **1.6.5 Permitting Improvement**

5 In order to efficiently and effectively manage the large volume of permits required for
6 the Project, BC Hydro continues to engage with regulators, First Nations
7 communities and contractors to share information, seek feedback, and identify
8 process improvements. Process improvements implemented include the following:

- 9 • BC Hydro continues to facilitate meetings with the Ministry of Forests, Lands,
10 Natural Resource Operations and Rural Development, the Comptroller of Water
11 Rights, the Department of Fisheries and Oceans and contractors to ensure
12 permit applications are coordinated, timely and sufficient;
- 13 • Regular permitting forums are being held with Indigenous groups to share
14 information on upcoming permit applications and to seek feedback before
15 applications are submitted to regulators;
- 16 • BC Hydro has implemented a coordinated Indigenous groups consultation
17 process with the Ministry of Forest, Lands, Natural Resource Operations and
18 Rural Development to assist with the government permit workload; and
- 19 • Permit forum #12 was held on May 2, 2019, covering five permits and
20 authorizations for Highway 29 realignment at Halfway River, including
21 approvals for bridge construction.

22 **1.7 Environment**

23 **1.7.1 Mitigation, Monitoring and Management Plans**

24 The Environmental Assessment Certificate and Federal Decision Statement
25 conditions require the development of draft and final environmental management,

1 mitigation and monitoring plans, as well as the submission of annual reports on
2 some of these plans.

3 Focus remains on minimizing sediment and erosion across the dam site, care of
4 water, hydrocarbon management, invasive weed control and wildlife identification
5 and avoidance.

6 On the left bank, construction of the sediment control features located at L3 (a gully
7 on the left bank which contains a stream that flows for a portion of the year) is
8 substantially complete and the control features effectively conveyed water during the
9 spring rain events. Care of water systems are substantially complete within the till
10 conveyor area and include directional ditching, sediment control devices and ponds.

11 On the right bank, management of water that has contacted naturally occurring
12 acidic rock has been substantially implemented. Works are progressing on schedule
13 for the right bank downstream side channel fish enhancement project. This project
14 creates shallow, still backwaters that provide valuable habitat for fish within the
15 Peace River.

16 Wildlife mitigation works have progressed on the construction of the right bank side
17 channel fish enhancement downstream of the dam as well as the wildlife habitat
18 installations for bats and fishers upstream of the dam.

19 Wildlife and fisheries studies continue to collect baseline usage data for comparison
20 post dam construction.

21 Air quality, water, noise and light monitoring continue at various locations throughout
22 the project with only localized or sporadic elevated readings noted.

23 As of June 30, 2019, all required submissions have been made in accordance with
24 the schedule and requirements of the conditions.

1 Also during this reporting period, one annual report was submitted to regulators in
2 accordance with the conditions.

3 **1.7.2 Environmental Compliance Inspections and Enforcement**

4 During the reporting period, the Site C Project was inspected by provincial regulators
5 from the B.C. Environmental Assessment Office who performed more than 36 hours
6 of inspections. No warning letters or orders were issued as a result of these
7 inspections. Compliance officers from the B.C. Environmental Assessment Office,
8 Canadian Environmental Assessment Agency, Ministry of Forests, Lands, Natural
9 Resource Operations, and Rural Development and the Ministry of Energy and Mines
10 performed on-site inspections during the reporting period. During the inspections,
11 environmental compliance was focused on the following areas:

- 12 • Selected over-greasing of equipment at the dam site area. BC Hydro is
13 requiring any non-compliant contractors to immediately address the
14 non-compliances and implement an action plan that requires equipment to be
15 maintained going forward to prevent a re-accumulation of grease; and
- 16 • Enhancing erosion and sediment control measures along the 85th Avenue
17 conveyor corridor. BC Hydro is addressing these concerns through the
18 installation of erosion and sediment control structures on the site. Hydroseeding
19 of both contact and non-contact slopes is also taking place within the deep cut
20 portions of the corridor. In addition, the catchment located at the base of the L3
21 ravine is handling sediment releases and reducing turbidity in downstream
22 reaches.

23 BC Hydro had 9,663 environmental inspection results over the reporting period, with
24 a compliant or partial compliant result of 98 per cent across all contractors and
25 works areas.

26 During the reporting period, the independent environmental monitor continued
27 weekly inspections with a focus on hydrocarbon management, waste disposal,

1 erosion and sediment control, dust management and wildlife management. Overall,
2 the weekly inspections indicated general environmental compliance.

3 Site C Project staff met bi-weekly with provincial regulators to ensure ongoing focus
4 and attention to the areas of most importance and concern for the regulators and to
5 proactively address any environmental or regulatory issues that could arise.

6 Additionally, the Site C Project has engaged both an Independent Environmental
7 Monitor and an Independent Engineer that report directly to provincial regulators.
8 The Independent Environmental Monitor provides weekly reports that have
9 demonstrated substantial compliance across the Project while continuing to identify
10 areas of focus for sediment and erosion control, water management and spill
11 prevention. The Independent Engineer works directly with site staff to proactively
12 identify design issues that may impact the environment and develop mitigation plans
13 to avoid or minimize impacts.

14 **1.7.3 Heritage**

15 In accordance with a number of Environmental Assessment Certificate and Federal
16 Decision Statement conditions, the Site C Heritage Resources Management Plan
17 addresses the measures that will be used to mitigate the adverse effects of the
18 Project on heritage resources.

19 The 2019 heritage field program is focused on field work that will meet regulatory
20 requirements for pre-construction archaeological impact assessments, and
21 systematic data recovery at selected archaeological sites. This year's field season
22 was initiated in May 2019, and is anticipated to be completed in November 2019.

23 During the reporting period, BC Hydro's heritage specialist did not submit any
24 archaeological interim reports to the BC Archaeology Branch or Indigenous Groups
25 per the Heritage Conservation Act permit terms and conditions. This field season's
26 interim reports will be submitted starting in July 2019.

1 Heritage reviews of contract documents, contractor environmental plans and
2 construction readiness plans were performed on an ongoing basis to ensure
3 compliance. In this reporting period, two new Heritage Conservation Act permits
4 were received, and zero heritage chance finds were reported.

5 Additionally, the assemblage of paleontological samples recovered as part of the
6 Site C paleontology field program was formally transferred into the permanent
7 collection of the Royal British Columbia Museum in Victoria.

8 **1.7.4 Agricultural Mitigation and Compensation Plan Framework**

9 As part of the Site C Agricultural Mitigation and Compensation Plan, BC Hydro has
10 established a \$20 million BC Hydro Peace Agricultural Compensation Fund to
11 support agricultural production and related economic activity in the Peace Region.
12 The fund is governed by a regional decision-making board made up of
13 representatives from five regional agricultural organizations, the Peace River
14 Regional District, three agricultural producer members-at-large and one Peace River
15 Valley agricultural producer. Northern Development Initiative Trust was selected as
16 the fund administrator in a public request for proposals process with a contract
17 concluded on August 8, 2018. BC Hydro approved the financial management plan
18 for the \$20 million fund, which was developed by Northern Development Initiative
19 Trust and the fund board. In December 2018, BC Hydro transferred \$20 million to
20 Northern Development Initiative Trust. In spring 2019, the board and Northern
21 Development Initiative Trust established a \$250,000 first agricultural grant intake
22 which will open in August 2019.

1.8 Labour, Employment and Training Initiatives and Building Capacity Initiatives

1.8.1 Labour

To date, unions that have participated in the construction of Site C are listed in [Table 5](#) below.

Table 5 – Participating Unions

Union
Construction Maintenance and Allied Workers (CMAW)
Christian Labour Association of Canada (CLAC), local 68
Canada West Construction Union (CWU)
Construction and Specialized workers Union (CSWU), local 1611
International Union of Operating Engineers (IUOE), local 115
Ironworkers, local 97
International Brotherhood of Electrical Workers (IBEW)
MoveUP, local 378
Pile Drivers 2402
The Boilermakers, lodge 359
The United Association of Journeymen & Apprentices of the Plumbing & Pipefitting Industry of the U.S. & Canada, local 170
Teamsters, local 213

In addition, ten unions affiliated with the BC Building Trades will be working on the installation of the turbines and generators. Since September 2017, members of the Boilermakers, lodge 359, have been working on this contract.

The generating station and spillways contractor has signed a labour agreement for the generating station and spillways civil works with the IUOE Local 115, the CSWU Local 1611 and CMAW.

Further, the substation contractor has negotiated labour agreements with the IBEW for the electrical work on the Site C substation, and their civil subcontractor has been certified to the CMAW. The transmission contractor is performing transmission line work on the Project and is signatory to a labour agreement with the IBEW.

1.8.2 Employment

Contractors submit monthly workforce data electronically to BC Hydro. [Table 5](#) presents the monthly number of construction contractors, non-construction contractors, engineers, and project team workers for this period. As with any construction project, the number of workers – and the proportion from any particular location – will vary month-to-month and also reflects the seasonal nature of construction work.

Table 5 Site C Jobs Snapshot Reporting Period – April 2019 to June 2019

Month	Number of B.C. primary residents ⁹	Number of total workers ¹⁰
April 2019	2,950	3,775
May 2019	3,395	4,385
June 2019	3,521	4,634

In June 2019, 76 per cent of the workforce was made up of residents of British Columbia, while 21 per cent of the workforce lived in the Peace River Regional District. The on Site Contractor workforce number also includes 14 per cent women and 189 workers who are working for various contractors as apprentice carpenters, welders, electricians, millwrights, ironworkers, mechanics, boilermakers and heavy equipment operators.

1.8.3 Training and Capacity Building Initiatives

In September 2017, the Contractors Labour Committee agreed to establish an Indigenous labour subcommittee. The purpose of the subcommittee is to support

⁹ Employment numbers provided by Site C contractors and consultants are subject to revision. Data not received by the Project's deadlines may not be included in the above numbers. Employment numbers are direct only and do not capture indirect or induced employment.

¹⁰ Total workers include:

- Construction and non-construction contractors performing work on Site C dam site, transmission corridor, reservoir clearing area, public roadwork, worker accommodation and services;
- Engineers and project team that is comprised of both on-site and off-site workers; and
- The project team, which includes, BC Hydro construction management and other offsite Site C project staff. An estimate is provided where possible if primary residence is not given.

1 Indigenous training, labour and employment on Site C through communication,
2 consultation, coordination and cooperation among contractors on the Project.

3 The committee meets quarterly, or on an as-needed basis. All major Site C
4 construction contractors currently attend this meeting.

5 The committee has developed a number of initiatives, such as:

- 6 • Established a protocol for distribution of Indigenous candidate resumes;
- 7 • Developed and implemented the Indigenous Employment and Information Day;
- 8 • Participated in the development of the BC Hydro and Northern Lights College
9 pre-carpentry skills pilot program on the Site C Project;
- 10 • Reviewed and assisted contractors in contract reporting requirements;
- 11 • Discussed communication of site-wide policies;
- 12 • Shared regional cultural events with project contractors;
- 13 • Shared BC Hydro's Indigenous Employment and Business Development
14 employment and training initiatives;
- 15 • Reviewed contractors' best practices;
- 16 • Shared success stories to assist in generating opportunities; and
- 17 • Reviewed project status and upcoming labour requirements for contractors and
18 how to meet labour demands.

19 BC Hydro has included apprentice targets in the generating station and spillways
20 civil works contract, the transmission lines and the substation contracts, and the
21 Highway 29 work to be procured by BC Hydro.

22 As of June 2019, the generating station and spillways contractor employed
23 approximately 220 journeyman carpenters on the generating station and spillways
24 civil works contract and 50 apprentices. This amounts to 22 per cent of all these

1 workers being apprentices. Further, 13 per cent of the carpentry workforce from the
2 generating station and spillways contractor self-identifies as Indigenous. Of the
3 self-identified Indigenous carpenters, nearly 33 per cent are apprentices.

4 In August 2013, Northern Lights College Foundation started distributing the
5 BC Hydro Trades and Skilled Training Bursary Awards. As of June 30, 2019, a total
6 of 256 students had received bursaries, including 111 Indigenous students who have
7 benefitted from the bursary in programs such as electrical, welding, millwright,
8 cooking, social work, and many others. The bursary ended in October 2018, with
9 remaining amounts still available. However, BC Hydro has worked with the Northern
10 Lights College Foundation to extend the bursary for an additional year, and reserve
11 the remaining bursary amounts for trades programs directly needed for project work.
12 Part of this agreement was to set aside funds for the BC Hydro and Northern Lights
13 College pre-carpentry skills pilot program for Site C.

14 BC Hydro continues to work with local employment agencies to ensure that as job
15 opportunities become available, they are posted on the WorkBC website as well as
16 on the Fort St. John Employment Connections website. With the announcement of
17 the Louisiana Pacific Peace Valley Oriented Strand Board (**OSB**) mill permanent
18 curtailment, BC Hydro is working with Ministry of Forests, Lands, Natural Resource
19 Operations and Rural Development and their worker transition initiative to assist the
20 local community in responding to this closure. In June 2019, Site C contractors
21 reported 829 workers on-site from the Peace River Regional District. This is a total
22 of 21 per cent of the Site C construction and non-construction contractors'
23 workforce.

24 Site C contractors have noted that certain trades will be in high demand over the
25 next two to three years during peak project construction periods. As such, major
26 contractors on-site are exploring opportunities for apprentice and other training
27 on-site. BC Hydro worked with Northern Lights College and Site C contractors to
28 develop the BC Hydro and Northern Lights College pre-carpentry skills pilot program

1 on site. This program was successfully delivered in April 2019 and BC Hydro and
2 Northern Lights College are currently planning on delivering the program again in
3 spring 2020.

4 The intent of this program is to provide an overview of the skills required for the
5 carpentry trade (essential skills training), general employment knowledge
6 (employment readiness), overview of job requirements for carpenters, knowledge of
7 B.C.'s apprenticeship system, and Site C Project-specific knowledge.

8 This is a 14 day program designed for local new workers or workers new to the trade
9 with preference given to local Indigenous candidates. The course was partly run at
10 the worker accommodation camp and the 14 days was intended to reflect a typical
11 Site C schedule.

12 The main civil works contractor has reported apprentices in the heavy equipment
13 operator and labourer trades through a new training program in partnership with
14 Christian Labour Association of Canada (**CLAC**) and the Industry Training Authority.

15 BC Hydro facilitated the fourth Site C Project Indigenous Employment and Training
16 Information Session in Fort St. John in July 2019. The purpose of these meetings is
17 to assist in building relationships between employment and training professionals
18 from the Indigenous communities and key Site C contractors.

19 **1.9 Community Engagement and Communication**

20 **1.9.1 Local Government Liaison**

21 There are a number of Environmental Assessment Certificate conditions that are
22 relevant to local communities in the vicinity of the Project. BC Hydro is implementing
23 some of these conditions through community agreements offered to five local
24 governments. Through these discussions BC Hydro has, in some instances, agreed
25 to additional measures to address concerns about local community impacts from
26 construction and operation of the Project.

1 BC Hydro has concluded four community agreements with respect to the Project: the
2 District of Taylor (2013), the District of Chetwynd (2013), the City of
3 Fort St. John (2016) and the District of Hudson’s Hope (2017). BC Hydro and the
4 City of Fort St. John established a Community Agreement Monitoring Committee to
5 jointly oversee implementation of the community agreement. BC Hydro continues to
6 work cooperatively with the City of Fort St. John, District of Hudson’s Hope,
7 District of Taylor and the District of Chetwynd to ensure implementation of their
8 respective agreements.

9 During this reporting period, the Regional Community Liaison Committee, which is
10 comprised of local elected officials and local First Nations communities, met once
11 (June 19, 2019). Eight local governments and four local First Nations communities
12 (McLeod Lake, Doig River, Saulteau and Blueberry River) as well as the two MLAs
13 for Peace River North and Peace River South, are invited to participate as
14 committee members. Representatives from the Project’s major contractors have also
15 attended the meetings as invited guests.

16 **1.9.2 Business Liaison and Outreach**

17 BC Hydro continued to implement its business construction liaison and outreach by
18 attending local chamber of commerce meetings in Fort St. John and Chetwynd.
19 During this reporting period, the project team sent one notification to the Site C
20 business directory.

21 **1.9.2.1 Community Relations and Construction Communications**

22 BC Hydro continued to implement its construction communications program
23 throughout the reporting period. The program includes updating and maintaining the
24 project website (www.sitecproject.com) with current information, photos and videos
25 of construction activities, and providing information to local and regional
26 stakeholders as required.

1 A community open house was held in Hudson's Hope on June 12, 2019 to provide
2 an update on Site C construction, as well as plans underway to help mitigate the
3 impacts related to the project.

4 ***Construction Bulletins***

5 There were six bi-weekly construction bulletins issued throughout this reporting
6 period. These bulletins are posted on the project website and sent by email to the
7 web-subscriber list.

8 ***Public Enquiries***

9 In total, BC Hydro received 580 public enquiries between April 1, 2019 and
10 June 30, 2019, compared to 577 in the previous quarter. The majority of these
11 enquiries continued to be about business and job opportunities, with limited
12 construction impact concerns from local residents. [Table 6](#) shows the breakdown of
13 some of the most common enquiry types.

14 In total, BC Hydro has received more than 10,200 enquiries since August 2015.

1 **Table 6 Public Enquiries Breakdown**

Enquiry Type ¹¹	April 2019	May 2019	June 2019
Job Opportunities	177	119	104
Business Opportunities	29	24	43
General Information	15	15	12
Construction Impacts ¹²	5	9	4
Other ¹³	10	6	8
Total	236	173	171

 2 **1.9.2.2 Communications Activities**

 3 Based on a search using the media database Infomart, there were 98 stories
 4 referencing the Site C Project in B.C. news media between April 1, 2019 and
 5 June 30, 2019, compared to 124 media stories in the previous quarter.

 6 **1.9.3 Housing Plan and Housing Monitoring and Follow-Up Program**

 7 BC Hydro and BC Housing signed a contribution agreement on July 19, 2016 related
 8 to the development, construction and operation of a building in Fort St. John
 9 comprised of 50 residential rental units. This agreement is the outcome of detailed
 10 discussions between the two partners to find the most appropriate approach to
 11 meeting the Project's environmental assessment conditions and the housing terms
 12 of the Community Measures Agreement with the City of Fort St. John. The
 13 agreement structured the financial contribution from BC Hydro to enable viable
 14 financial operation of the affordable housing units in the near-term and viable
 15 financial operation of all 50 units of affordable housing in the longer term.

 16 The housing project construction has been completed by Western Canadian
 17 Properties Group with landscaping and other finishing works underway. BC Hydro
 18 completed a head lease with BC Housing in May 2019 for 20 units in the building.

11 This table is a sample of enquiry types and does not include all enquiry types received.

12 The nature of the construction impact inquiries is primarily air quality, noise and traffic conditions.

13 "Other" accounts for enquiries related to a variety of other topics, such as recreation access near construction sites, property owner correspondence, or requests for site tours.

1 Any suites not utilized by BC Hydro are available to BC Housing to offer for public
2 rental.

3 **1.9.4 Labour and Training Plan**

4 In accordance with an Environmental Assessment Certificate condition, a Labour
5 and Training Plan was developed and submitted to the Environmental Assessment
6 Office on June 5, 2015. This plan, as well as Environmental Assessment Certificate
7 Condition 45, include reporting requirements to support educational institutions in
8 planning their training programs to support potential workers in obtaining project jobs
9 in the future. This report was issued to the appropriate training institutions in the
10 northeast region of B.C. in July 2016, July 2017, July 2018 and July 2019.

11 **1.9.5 Human Health**

12 **1.9.5.1 Health Care Services Plan and Emergency Service Plan**

13 The Project health clinic is contracted by BC Hydro with Halfway River International
14 SOS Medical Ltd., a partnership between Halfway River First Nation and
15 International SOS. The clinic continues to operate in its permanent location within
16 the Two Rivers Lodge, and based on camp occupancy, was staffed 24/7 during this
17 period with a nurse practitioner and advanced care paramedics. BC Hydro and the
18 clinic operator continue to liaise with the local health care community.

19 The clinic provides workers with access to primary and preventative health care and
20 work related injury evaluation and treatment services and is currently open seven
21 days a week, 24 hours a day. Since opening the health clinic, there have been a
22 total of 10,624 patient interactions. During the reporting period, there were
23 1,463 patient interactions, of which 369 were occupational and 1,094 were
24 non-occupational. Several preventive health themes were promoted to workers
25 including: first aid, healthy food choices and physical activity, and heat exhaustion
26 and hydration.

1 **1.9.6 Property Acquisitions**

2 During this quarter, BC Hydro continued to access private properties to inform
3 design and mitigation options for the Project. BC Hydro also completed the
4 acquisition of rights over two private properties impacted by reservoir inundation and
5 the Highway 29 re-alignment project. With the exception of portions of Cache Creek
6 East and portions of Lynx Creek East, the property acquisition drawings for all
7 highway components and the Hudson’s Hope shoreline protection project have been
8 finalized.

9 In the next quarter, BC Hydro will continue the property acquisition process for the
10 various properties impacted by the Highway 29 re-alignment project and the
11 Hudson’s Hope shore line protection project.

12 **1.10 Key Procurement and Contract Developments**

13 **1.10.1 Key Procurement**

14 The procurement approach was approved by the board of directors in June 2012 for
15 the construction of the Project. The procurement approach defined the scope of the
16 major contracts and their delivery models, as summarized in [Table 7](#) below.

1
2

Table 7 Major Project Contracts and Delivery Models

Component	Contract	Procurement Model	Anticipated Timing
Worker Accommodation	Worker accommodation and site services contract	Design-Build-Finance-Operate-Maintain	Completed
Earthworks	Site preparation contracts	Predominantly Design-Bid-Build	Completed
	Main Civil Works contract	Design-Bid-Build	Completed
Reservoir/Transmission Clearing	Multiple reservoir clearing contracts to be awarded over seven to eight years	Design-Bid-Build	Five contracts completed (transmission line, lower and eastern reservoirs)
Generating Station and Spillways	Turbines and Generators contract	Design-Build	Completed
	Generating Station and Spillways Civil Works contract	Design-Bid-Build	Completed
	Hydromechanical Equipment contract	Supply Contract	Completed
	Balance of Plant Equipment Supply	Supply Contracts	Four contracts completed (generator terminal equipment, protection and control panels, generator circuit breakers and AC station service equipment), six more contracts to be awarded in fiscal 2020
	Balance of Plant Contract	Design-Build/Design-Bid-Build	Site visit with the three shortlisted proponents held on June 19, 2019
Electrical and Transmission Infrastructure	Transmission Lines Construction contract	Design-Bid-Build	Completed
	Site C substation contract	Design-Bid-Build	Completed
	Peace Canyon Substation upgrade contract	Design-Build	Completed
Highway 29 Realignment	Cache Creek West 2018 and 2020 scope of work	Design-bid-Build	Completed
	Halfway River Bridge, Grade and Paving	Design-Bid-Build	October 2019
	Cache Creek East Embankment	Design-Bid-Build	October 2019
	Design-Bid-Build in coordination with B.C. Ministry of Transportation and Infrastructure with anticipated contracts being awarded from 2019 to 2022		

1.10.2 Major Construction Contracts Exceeding \$50 Million

Since inception of the Project seven major construction contracts have been awarded that exceed \$50 million in value, as shown in [Table 8](#).

All of the construction contracts have been procured and awarded through the competitive public procurement process within the budget established for each contract.

Table 8 Major Contracts Exceeding \$50 Million

Work Package	Contract Value ¹⁴ (\$ million)	Contract Execution Date
Site Preparation: North (Left) Bank	60	July 2015
Worker Accommodation	473	September 2015
Main Civil Works	2,127	December 2015
Turbines and Generators	464	March 2016
Generating Station and Spillways Civil Works	1,622	March 2018
Hydromechanical Equipment	69	April 2018
Transmission Line Construction	114	May 2018

1.10.3 Contracts Exceeding \$10 Million

For open contracts procured and awarded in excess of \$10 million, refer to [Appendix C](#).

1.10.4 Contract Management

1.10.4.1 Material Changes to the Major Contracts

The main civil works contract is a unit price contract and as such variations in quantities and design are expected over the term of the contract. Since contract award in December 2015, the main civil works contract value has increased by \$379 million to reflect approved changes to date. To June 30, 2019, the changes have been managed within project contingency.

¹⁴ Contract value reflects the current value including executed change orders to the end of the reporting period.

1 **1.10.4.2 Contingency and Project Reserve Draws**

2 As a result of the change in timing for river diversion and other factors including an
3 increase in direct and indirect costs, BC Hydro revised the project budget to
4 \$10.7 billion, which was approved by the provincial Treasury Board in January 2018
5 and the BC Hydro board of directors in February 2018. This revised budget includes
6 an \$858.1 million contingency allowance and a \$708.0 million reserve that is subject
7 to Treasury Board's discretion.

8 The project has a risk management plan that establishes the risk management
9 framework for the project and describes specific processes, procedures,
10 organization, tools and systems that guide and support effective risk management.
11 Utilizing this plan, risks are identified, assessed and managed on a continuous
12 basis. The output of the risk management process is documented in the risk register.
13 The risk register is utilized as an input into project forecasts and cost risk analysis is
14 conducted periodically to inform contingency requirements. Subsequent to the
15 reporting period, work commenced on the next cost risk analysis and that
16 information will be used to inform the next quarterly progress report.

17 Refer to [Appendix E](#) for more detailed information regarding contingency and project
18 reserve draws.

1 **1.11 Plans During Next Six Months**

2 [Table 9](#) below presents the key milestones for activities planned during the next
3 six months.

4 **Table 9 Key Milestones for Activities Planned**
5 **during the Next Six Months**
6 **(July 2019 to December 2019)**

Milestone	Performance Measurement Baseline	Plan Date (Control Date ¹⁵)	Forecast ¹⁶	Variance
Generating Station and Spillways				
Main service bay ready for powerhouse bridge cranes assembly and erection	July 2019	July 2019	June 2019	Complete
Work Area W3 Access to generating station and spillways	November 2019	November 2019	November 2019	On track
Powerhouse bridge cranes commissioned and ready for travel load tests	December 2019	December 2019	December 2019	On track
Highways				
Halfway River grading, paving and bridge contract award complete	July 2019	October 2019	October 2019	On track
Main Civil Works				
Cast-in-place concrete & roller-compacted concrete of spillway (apron boundary around roller-compacted concrete walls) complete	October 2019	October 2019	October 2019	On track
Diversion tunnel inlet structure complete	January 2020	January 2020	December 2019	On track
Diversion tunnels 1 & 2 construction complete	November 2019	November 2019	February 2020 ¹⁷	At risk
Turbines and Generators				
Unit 1 draft tube supply complete	August 2019	August 2019	August 2019	On track
Transmission				
Peace Canyon GIS in-service date	October 2019	October 2019	July 2019	On track

¹⁵ Control date reflects plan, adjusted for approved changes to milestone dates.

¹⁶ As of June 30, 2019.

¹⁷ In response to some delays with the excavation of the diversion tunnels, the construction activities required to complete the diversion tunnels have been re-sequenced, by advancing some activities and delaying others, to optimize the schedule. This optimized schedule still achieves the key schedule milestones associated with river diversion in fall 2020.

1 **1.12 Impacts on Other BC Hydro Operations**

2 In the reporting period, GM Shrum and Peace Canyon dams were operated as
 3 expected during this phase of the Site C construction, with no material impacts on
 4 generation or water management relative to plan. BC Hydro continues to plan the
 5 operation of Williston Reservoir to reduce the risks to the Project during the Site C
 6 river diversion.

7 **1.13 Site Photographs**

8 Refer to [Appendix A](#) for Site Construction photographs.

9 **2 Project Schedule**

10 **2.1 Project In-Service Dates**

11 As filed with the British Columbia Utilities Commission Inquiry respecting Site C on
 12 October 4, 2017, BC Hydro identified that the river diversion milestone will move
 13 from 2019 to 2020. This did not impact the overall in-service dates, as shown in
 14 [Table 10](#) below.

15 **Table 10 In-Service Dates**

Description	Final Investment Decision In-Service	Status
5L5 500 kV Transmission Line	October 2020	On Track
Site C substation	November 2020	On Track
5L6 500 kV transmission line	July 2023	On Track
Unit 1 (first power)	December 2023	On Track
Unit 2	February 2024	On Track
Unit 3	May 2024	On Track
Unit 4	July 2024	On Track
Unit 5	September 2024	On Track
Unit 6	November 2024	On Track

1 **2.2 Project Governance, Costs and Financing, and Risk**

2 **2.2.1 Project Governance**

3 In December 2017, the provincial government announced their approval to continue
4 with construction of the Site C project. The approval to proceed included increased
5 external and internal oversight of project performance. Measures to improve project
6 governance implemented this quarter include:

- 7 • EY Canada continued to provide independent oversight for the Project including
8 budget oversight, schedule evaluation and risk assessment analysis. BC Hydro
9 and EY Canada are working collaboratively on enhancements to risk analysis
10 and reporting; and
- 11 • A Technical Advisory Board meeting was held in May 2019 when a variety of
12 technical and other issues were discussed with a final report being issued. The
13 four day meeting took place in Fort St. John and Vancouver.

14 **2.2.2 Project Budget Summary**

15 As a result of the change in timing for river diversion and other factors including an
16 increase in direct and indirect costs, BC Hydro presented a revised cost estimate of
17 \$10.7 billion to the board of directors in December 2017.

18 [Table 11](#) below presents the overall project budget, based on the project budget
19 approved in February 2018, represented in nominal dollars.

1 **Table 11 Project Budget**

Description	(Nominal \$ million)
Dam, Power Facilities, and Associated Structures	4,548
Offsite Works, Management and Services	1,845
Total Direct Construction Cost	6,393
Indirect Costs	1,456
Total Construction and Development Cost	7,849
Contingency	858
Interest During Construction	1,285
Project Budget, before Treasury Board Reserve	9,992
Treasury Board Reserve	708
Total Project Budget	10,700

 2 **2.3 Project Expenditure Summary**

3 [Table 12](#) provides a summary of the budget for the total Project, the current forecast
 4 total Project cost and the variance between the two. It also presents the cumulative
 5 updated budget amount planned to June 30, 2019 compared to the cumulative
 6 actual costs incurred to June 30, 2019 and the variance between the two.

7 **Table 12 Total Project Expenditures Budget**
 8 **Compared to Forecast and Life to Date –**
 9 **Budget Compared to Actual**
 10 **Expenditures to June 30, 2019**
 11 **(\$ million Nominal)**

Description	Total Project			Life to Date, to June 30, 2019		
	Budget	Forecast	Variance	Budget	Actual Expenditures	Variance
Project	9,992	9,992	0	3,665	3,817	(152)
Treasury Board Reserve	708	708	0	0	0	0
Total Project	10,700	10,700	0	3,665	3,817	(152)

12 [Table 13](#) below provides a summary of the 2019/20 to 2021/22 Service Plan Project
 13 expenditures for Fiscal 2020 to June 30, 2019, the actual Project expenditures for
 14 Fiscal 2020 to June 30, 2019 and the related variance.

1 **Table 13 Actual Fiscal 2020 Project Expenditures**
 2 **Compared to 2019/20 to 2021/22 Service**
 3 **Plan (\$ million Nominal)**

Description	2019/20 to 2021/22 Service Plan June, 2019 YTD	Actual Expenditures June, 2019 YTD	Variance
Project	315	326	(11)
Treasury Board Reserve	-	-	-
Total Project	315	326	(11)

4 Details of the variances between actual and plan are in [Appendix E](#).

5 **2.4 Internal Project Financing versus External Borrowings to Date**

6 To date, all project funding has been from internal borrowings and there has been no
 7 Site C Project-specific debt issued. As part of BC Hydro's debt management
 8 strategy, BC Hydro's exposure to variable debt is managed within a board-approved
 9 range of 5 per cent to 25 per cent and a target of 15 per cent. In addition, since
 10 fiscal 2017, BC Hydro has hedged \$10.0 billion of its future forecast long-term debt
 11 issuances through the use of derivative contracts to lock in interest rates. As at
 12 June 30, 2019, \$5.6 billion of hedges remained outstanding to hedge future debt
 13 issuances, hedging approximately 75 per cent of BC Hydro's forecast total borrowing
 14 requirements out to and including fiscal 2025.

15 **2.5 Material Project Risks**

16 Material project risks are identified and reviewed on an ongoing basis. As the Project
 17 progresses through implementation phase, the material project risks will evolve to
 18 reflect the current risks facing the Project. The following list of material project risks
 19 does not include risks that are subject to confidentiality obligations or solicitor client
 20 privilege, or that disclose commercially sensitive information relating to matters that
 21 are currently outstanding, including procurements and negotiations that are in
 22 progress at the time of this report, the disclosure of which would be harmful to
 23 BC Hydro's commercial interests.

1 Refer to [Table 14](#) below for a list of the material project risks.

2 **Table 14 Material Project Risks**

Risk Description	Impact and Response Plan Summary
Risk of river diversion system delay if contractor productivity does not meet plan and/or differing geotechnical conditions	<p>Impact: Diversion delay could cause the schedule to slip by a year and increase costs.</p> <p>Response: BC Hydro closely monitors the development of design and construction plans, and labour and equipment productivity for critical construction activities (tunnel excavation/linings, inlet/outlet portals, and gates and cofferdam); provision of incentives through settlement agreement with contractor.</p>
Risk that BC Hydro's borrowing costs for project are higher than budgeted	<p>Impact: Rising interest rates increase the Project's interest costs above the amount budgeted.</p> <p>Response: BC Hydro has hedged interest rates on approximately 75 per cent of future debt placements through fiscal 2025 to reduce the potential impact of rising interest rates.</p>
Risk that worker accommodation is not sufficient	<p>Impact: Increased cost to cover additional bed nights in camp; possible contractor workforce impacts; increased cost for local lodging and potential impacts on the community.</p> <p>Response: Implemented Phase 1 expansion to add 150 beds to the camp in July 2019. Continue to assess forecast bed night requirements and expand and contract the camp capacity to meet the needs of the Project.</p>
Risk of contractor labour rate increases in excess of budgeted amount	<p>Impact: BC Hydro has included provisions in major contracts that allow for labour escalation to a prescribed amount, as well as a cost/savings sharing formula based on general industry rates above or below the prescribed amount. Increased pressure on the labour market would likely drive labour wage rates higher, potentially resulting in general industry increases beyond the prescribed amounts.</p> <p>Response: BC Hydro has defined contract labour escalation formulas in all major contracts.</p>
Risk of a safety incident resulting in fatality or disabling injury	<p>Impact: Serious worker injury or fatality; project delays and associated costs.</p> <p>Response: Continue with BC Hydro and contractor safety steering committee to address shared safety issues and opportunities; BC Hydro and contractors have implemented safety cultural leadership training; increase BC Hydro executive involvement and engagement with site safety leadership; regularly hold on-site safety conferences; contractor to bring in senior safety manager to prepare safety improvement plan for BC Hydro review; continue to include safety in BC Hydro and contractor on-boarding orientations; and continue to promote a strong safety culture.</p>

Risk Description	Impact and Response Plan Summary
For work fronts other than the left bank diversion tunnels: risk of differing geotechnical conditions	<p>Impact: Potential schedule delay and increased cost.</p> <p>Response: Completed detailed geotechnical investigations prior to construction; close monitoring and quick intervention to manage construction risk if geotechnical issues arise.</p>
Risk of additional Engineering costs to complete design, support construction and staff supervision in the field up to Fiscal 2025	<p>Impact: Exceed budget due to work required for as found site conditions, complete design, and support schedule and construction activities; Insufficient resources to complete, manage and/or oversee engineering work.</p> <p>Response: Optimize BC Hydro resources; optimize work front team structure and minimize duplication of activities; work with contractors to increase their quality control staffing.</p>
Risk that Highway 29 costs exceed the approved budget	<p>Impact: As designs are finalized and procurement is conducted, costs could exceed the approved budget.</p> <p>Response: Conduct value engineering during design phase to find cost savings and/or reduce cost increases; conduct independent reviews of cost estimates and optimize the number of contracts using the Ministry of Transportation and Infrastructure’s competitive public tender process.</p>
Risk that spillway costs increase materially due to design changes	<p>Impact: Increased concrete quantities result in higher construction costs.</p> <p>Response: Issue revised drawings to the contractor. Meet with the contractor to plan work so that construction cost increases are minimized.</p>
Risk that Indigenous groups do not support the Project	<p>Impact: Indigenous groups file legal challenges or engage in protest actions that could delay or stop the project work and/or increase costs.</p> <p>Response: Project team to continue to engage and consult with First Nations and ensure commitments to First Nations are met or exceeded; fully support the development of legal response documents; continue to negotiate Impact Benefit Agreements.</p>
Risk that reservoir clearing costs are higher than budget	<p>Impact: Overall reservoir clearing costs increase.</p> <p>Response: Review scope, modify approach, negotiate pricing, provide sufficient time to negotiate; work with BC Hydro Indigenous Relations on procurement of clearing services; develop alternative procurement options if planned procurements are not feasible.</p>
Risk of dam construction delay	<p>Impact: Contractor misses milestone(s) and BC Hydro incurs schedule related delay costs.</p> <p>Response: On-site physical progression captured and reported on a weekly basis for key work fronts. BC Hydro monitors key interface milestones and reviews with contractor on regular basis.</p>

Risk Description	Impact and Response Plan Summary
Risk that productivity for roller-compacted concrete is lower than planned	<p>Impact: Lower productivity may result in delays to project schedule; potential interface issues may arise with other contractors.</p> <p>Response: Detailed planning completed in advance of work starting. Physical progress is captured and reported on a weekly basis for key work fronts. Key interface milestones are monitored and discussed on a regular basis. Meetings are held with the contractor on a regular basis.</p>
Risk that the Project cannot attract and retain sufficient skilled workers	<p>Impact: Contractors may not be able to adequately source, supply, attract, and retain sufficient project labour due to workforce demographics, increased competition for labour from other major projects, and the requirement for specialized workers. This may result in potential impacts to schedule, safety, productivity and cost.</p> <p>Response: Contractors provide labour sourcing and supply plans, provide advance notice of foreign workers, and participate in local job fairs. BC Hydro encourages and facilitates capacity-building initiatives, and monitors employee turnover rates and labour conditions on other projects.</p>
Risk of on-going main civil works contractor claims	<p>Impact: Increased Construction Management & Contract Management effort required to respond to and investigate claims; settlement of claims may results in increased costs.</p> <p>Response: Ensure sufficient Commercial Management and legal resources in place; proactively resolve claims as received; ensure commercial management procedures are in place.</p>
Risk of insufficient on-site aggregate supply to meet demand	<p>Impact: Decreased productivity, schedule delays and increased cost that could impact multiple contracts. Aggregate supply required for concrete production (roller-compacted concrete, cast-in-place concrete/conventional vibrated concrete and shotcrete), dam (general fill, filter materials, drain material, and riprap), and highways.</p> <p>Response: Increase aggregate stockpiles; work with contractors to minimize waste and maximize aggregate production; release BC Hydro on-site contingency aggregate excavation sites and seek out additional aggregate on-site sources; procure off-site and haul in additional aggregate.</p>

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Appendix A

Site Photographs

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Figure A-1 Twenty-two new protection and control panels at Peace Canyon have been added and/or upgraded in preparation to receive the transmission from Site C (April 2019).



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Figure A-2 Two new 500 kV gantries (5L5, 5L6) have been installed at the Peace Canyon Substation to receive the 500 kV lines from Site C. A gantry is where the transmission lines tie onto and anchor at the substation (April 2019).



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Figure A-3 Construction of the 500 kV Site C Substation on the right bank. The structural steel and equipment installations are in progress (April 2019).



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Figure A-4 Environmental scientists release weevils to control Dalmatian toadflax, an invasive and noxious weed near the dam site. This release is an extension of the province's biocontrol program for toadflax, which has been in place since 1991 (April 2019).



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Figure A-5 Transition segment for Unit 1 of 6 of the penstocks. Each penstock starts with a transition piece that is shipped in four parts, each weighing 13,243 kilograms or 31,400 lbs. (April 2019).



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Figure A-6 After moving individual sections from a fabrication shop in Fort St. John, we assemble the penstocks on site. This is one of the six transition pieces which will funnel water from the river into our generating station (May 2019).



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Figure A-7 We will be building and assembling 84 of these penstock sections over the next few years, to create the six penstock pipes for Site C's generating station (May 2019).



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Figure A-8 Grading and levelling is occurring on the new alignment of Highway 29 at Cache Creek West (June 2019).



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Figure A-9 Newly built side channels on the Peace River provide fish habitat (June 2019).



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Figure A-10 Crews inspect the opening that connects both ends of the diversion tunnel excavations shortly after breakthrough in Tunnel 1 (June 2019).



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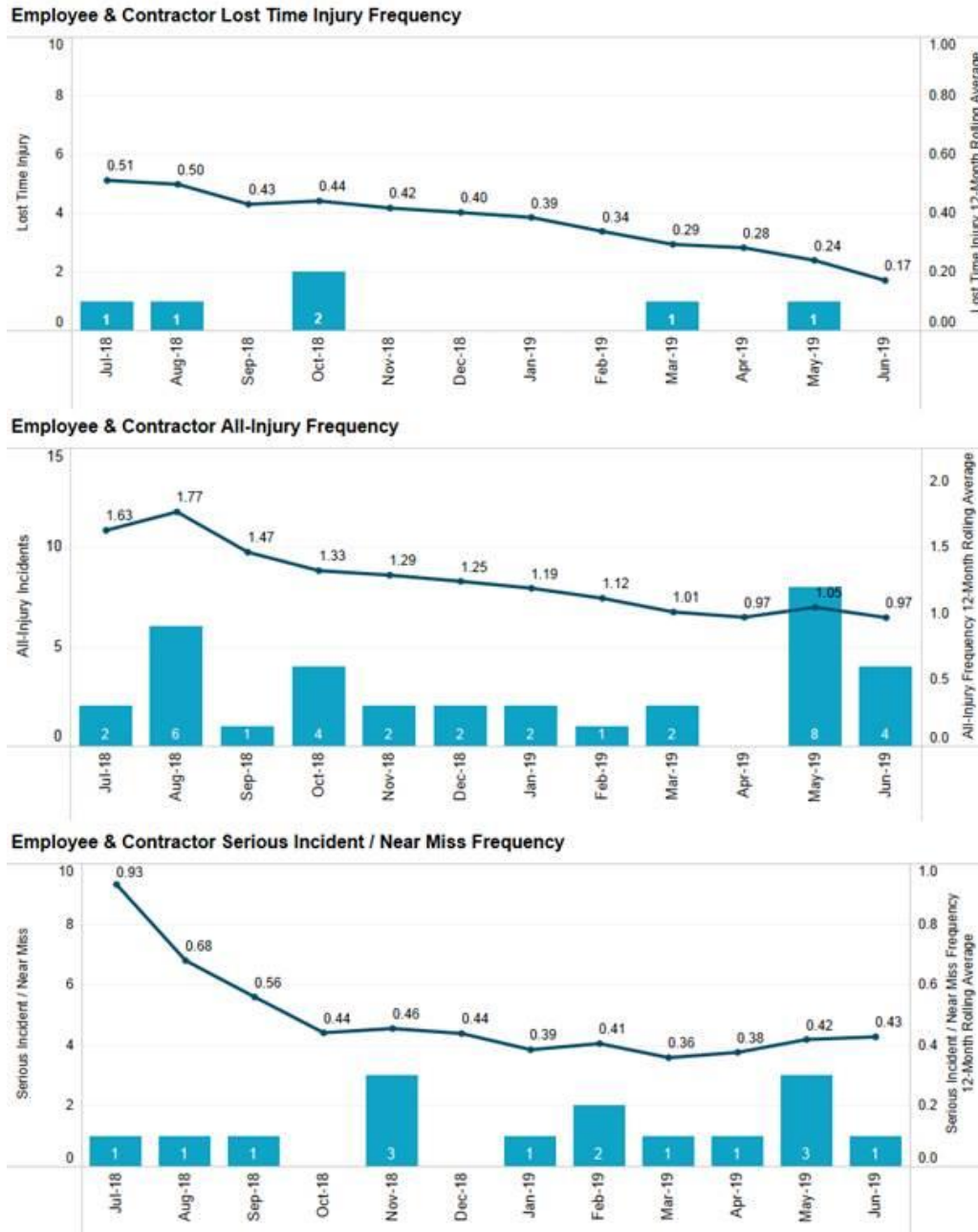
Appendix B

Safety and Security

1 [Figure B-1](#) below provides information on Employee and Contractor Serious
2 Incidents/Near Miss Frequency, Lost Time Injury Frequency and All Injury
3 Frequency from July 1, 2018 to June 30, 2019.

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Figure B-1 Employee and Contractor Serious Incidents/Near Miss Frequency, Lost Time Injury Frequency and All Injury Frequency



1 [Table B-1](#) lists the safety regulatory inspections and orders received from April 2019
2 to June 2019.

3 **Table B-1 Safety Regulatory Inspections and**
4 **Orders**

5 **WorkSafeBC**

Risk Level	Theme	Inspection reports and orders received	Date of Inspection
<p>Inspection #1: WorkSafeBC conducted a general inspection and focused on the lockout and safety program at the Peace Canyon Generation Station. At the time of the inspection, the Peace Canyon Generation Station was undergoing an upgrade to support Site C Dam. The current project entails the erection of two new 500 kV lines supplying power to the Site C Dam. The 500 kV lines will be terminated into gas insulated switch gear. Gas insulated switch gear uses sulfur hexafluoride to insulate the switch, replacing the need for oil filled circuit breakers.</p>			
No Orders			April 4, 2019
<p>Inspection #2: WorkSafeBC conducted an inspection on the Spillway where there was a slide of material.</p> <p>Topics of discussion with the sub-contractor and the prime contractor included, but not limited to, the following.</p> <p>Slide of Material: At 4:00 a.m. on Wednesday, May 29, 2019, there was a slide of material in an area referred to as block 8. The size of the slide was reported to be 5 meters horizontal length by 2 meters vertical length by 0.4 meters to 0.5 meters deep. There was a worker that was struck by the slide and has undetermined injuries.</p>			
Low	Sloping shoring requirements	Order #1: A special inspection must be made when required by malfunction or accident.	May 29, 2019
<p>Inspection #3: WorkSafeBC conducted an inspection as a result of a slide of material that occurred at the roller-compacted concrete spillway buttress excavation that was approximately 5 meters horizontal by 2 meters vertical and 0.5 meters in depth and involved an injury to a worker.</p> <p>That incident is currently under investigation by WorkSafeBC and may result in order being issued, in addition to any orders that are included in this inspection report. This may also be subject to further enforcement action arising out of the orders cited in this inspection report, or in subsequent inspection reports that relate to the incident referred to in this inspection report.</p> <p>The orders cited in this report are to address roller-compacted concrete spillway excavation block 8 section to elevations 383.0 to 396.0 material slide, observed at the workplace, that need attention prior to conducting all work within the hazardous area of the roller-compacted concrete block 8 slope excavation and correspond to written instructions on site.</p>			

Risk Level	Theme	Inspection reports and orders received	Date of Inspection
High Risk	Sloping shoring requirements	Order #1: Based upon the violation cited in this inspection report, WorkSafeBC has reasonable grounds to believe there is a high risk of serious injury, serious illness or death to a worker at this workplace. The WorkSafeBC orders that the roller-compacted concrete spillway buttress excavation block 8 section at this workplace is immediately stopped and that the workplace or any part of the workplace be cleared of persons and isolated by barricades, fencing or any other means suitable to prevent access to the area until the danger is removed.	May 29, 2019
Work Stoppage		Order #2: Excavation work was not done in accordance with the written instructions of a qualified registered professional if the excavation is more than 6 meters (20 ft.) deep.	
<p>Inspection #4: WorkSafeBC conducted an inspection on the Spillway where there was a slide of material. On May 29, 2019, there was a slide of material in an area referred to as block 8. The size of the slide was reported to be 5 meters horizontal by length by 2 meters vertical length by 0.4 meters to 0.5 meters deep. There was a worker employed by the contractor was struck by the slide and has undetermined injuries.</p> <p>At the time of the inspection the contractor was using written instructions by a qualified registered professional as the means of protection of the worker while working on the slope of the excavation.</p>			
High Risk	Sloping shoring requirements	Order #1: The contractor failed to ensure that the sides of the excavation were sloped as specified in writing by a qualified registered professional and sloped at angles, dependent on soil conditions, which will ensure stable faces.	May 29, 2019
<p>Inspection #5: WorkSafeBC conducted an inspection in Area 33 - Generating Stations & Spillways.</p> <ul style="list-style-type: none"> Discussions held with the contractor for submitting Employer Incident Investigations Reports occurred on June 6, 2019. An inspection of the provided documentation has revealed that the contractor has had approximately 100 incidents between February 24, 2019 to May 18, 2019, verification of the Claims Management Solution system of submitted claims by this officer indicates approximately 70 to 80 incidents in 2019, required submission to the WorkSafeBC board within 30 days. An updated (June 20, 2019) search of the WorkSafeBC Employer Incident Investigations Reports submission portal for contractor has shown two investigations being uploaded to date. The requirement to submit investigations to the WorkSafeBC Board within 30 days has not been followed by the contractor. 			
Low	Safety Documentation	Order #1: The contractor failed to submit all the remaining outstanding incidents to the WorkSafeBC Employer Incident Investigations Reports portal, and advise this officer when they uploaded to the system.	June 6, 2019

Risk Level	Theme	Inspection reports and orders received	Date of Inspection
<p>Inspection #6: This incident (IMS# 186015) resulted from the attempted towing of a disabled 14M grader by means of the all-terrain forklift and tractor trailer, a failure to negotiate a 90 degree corner and slight decline grade on left bank haul road L5 intersection. The all-terrain forklift inadvertently flopped over on its right-hand side onto the gravel road surface, which subsequently caused injury to a worker.</p> <p>The orders cited in this report are to address items, noted at the workplace, that need attention prior to conducting more work with respect to responsibilities, transportation, inspection, and work practices noted on location. Refer to orders 1, 2, 3, 4, 5, 6 & 7</p>			
Low Risk	Rights and Responsibilities	Order #1: A special inspection must be made when required by malfunction or accident.	June 6, 2019
High Risk	Safe Machinery and Equipment	Order #2: The contractor failed to ensure that the tow/winch line in the workplace is used in accordance with the manufacturer's instructions.	
High Risk	Rigging - Slings	Order #3: The contractor failed to ensure the edge or the sling must be protected to prevent damage to the sling when a sling is applied to a sharp edge of a load.	
High Risk	Operator's Responsibilities	Order #4: The operator of the mobile equipment failed to ensure to operate the equipment safely, maintain full control of the equipment, and comply with the laws governing the operation of the equipment.	
High Risk	Supervisor's Responsibilities	Order #5: A supervisor has knowingly permitted the workers to conduct a towing practice of the disabled 14M grader that created undue hazard to the health or safety of the workers.	
Low Risk	Standards	Order #6: The contractor failed to ensure the design, fabrication, use, inspection and maintenance of mobile equipment must meet the requirements of the following applicable standard: (e) Rough Terrain Forklifts: ANSI/ITSDF B56.6-2001, Safety Standard for Rough Terrain Forklift Trucks.	
Low Risk	Standards	Order #7: The contractor failed to ensure the design, fabrication, use, inspection and maintenance of mobile equipment must meet the requirements of the standard: Lift Truck Operator training: Canadian Standards Association Standard B335-94, Industrial Lift Truck Operator Training.	

Risk Level	Theme	Inspection reports and orders received	Date of Inspection
<p>Inspection #7: WorkSafeBC conducted an inspection at the till conveyor excavation for the Old Fort Road crossing.</p> <p>A worker and foreman could not provide the written instructions for the excavation, a power pole and sheet pile that cut through the Old Fort Road. Therefore a stop work order was issued.</p>			
Low Risk	Excavation – Work Standards	Order #1: Excavation work was not done in accordance with the written instructions of a qualified registered professional where the excavation was adjacent to a road, sheet pile and power pole.	June 26, 2019
Work Stoppage	Orders to stop work	Order #2: WorkSafeBC has reasonable grounds to believe there is a high risk of serious injury, serious illness or death to a worker at this workplace. Therefore, WorkSafeBC orders that work inside the excavation stop at this workplace is immediately stopped.	
<p>Inspection #8: WorkSafeBC conducted an inspection at SS2 Site 24 Compartment 1B to verify that the horizontal life lines were inspected and certified by a professional engineer.</p> <p>The contractor verified that the horizontal life lines are managed within a preventive maintenance program and that the preventive maintenance for the life lines is current.</p>			
		No orders	June 26, 2019

 1 **Ministry of Energy, Mines and Petroleum Resources**

Risk Level	Theme	Inspection reports and orders received	Date of Inspection
<p>Inspection #1: The inspector of mines examined the mines rescue equipment at the West Pine Quarry. It was noted that while mine rescue equipment is in place, it is deficient in some areas. Examples of this are the unknown age of the ropes and the amount of ropes. Additionally, there is only one harness available for the whole team. This is not sufficient.</p> <p>As per 3.7.5 of the Health, Safety and Reclamation Code of BC: The manager of an open pit mine employing more than 25 persons per shift shall ensure that (1) there is one fully trained and equipped mine rescue team, and (2) on every shift where more than 10 persons are working, there are four persons trained in mine rescue procedures.</p>			
Low	Safety Equipment	Order 1#: The contractor failed to ensure the adequate equipping of the mine rescue cache so as to have an equipped mine rescue team. This should be in conjunction with the mine rescue trainer.	May 14, 2019

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Appendix C

**Summary of Individual Contracts Exceeding
\$10 Million**

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CONFIDENTIAL ATTACHMENT

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Appendix D

Project Progression

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Appendix E

Detailed Project Expenditure

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Appendix F

Workforce Overview

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**Table F-1 Current Site C Jobs Snapshot
 (April 2019 to June 2019)¹⁸**

	Number of BC workers and total workers	Construction and non-construction contractors¹⁹ (including some subcontractors). Excludes work performed outside of B.C. (e.g., manufacturing)	Engineers and project team²⁰	Total
April 2019	BC Workers	1,927	645	2,950
	Total Workers	2,579	709	3,775
May 2019	BC Workers	2,185	673	3,395
	Total Workers	2,855	737	4,385
June 2019	BC Workers	2,293	651	3,521
	Total Workers	3,020	704	4,634

3 Employment numbers provided by Site C contractors are subject to revision. Data
 4 not received by project deadline may not be included in the above numbers.

5 BC Hydro has contracted companies for major contracts, such as main civil works,
 6 who have substantial global expertise. During the month of June 2019 there were
 7 nine workers in a specialized position working for Site C construction and
 8 non-construction contractors, which were subject to the Labour Market Impact
 9 Assessment process under the Federal Temporary Foreign Worker Program.
 10 Additionally, there were 48 management and professionals working for Site C
 11 construction and non-construction contractors through the Federal International
 12 Mobility Program.

¹⁸ Employment numbers are direct only and do not capture indirect or induced employment.

¹⁹ Construction and non-construction contractors includes work performed on Site C dam site, transmission corridor, reservoir clearing area, public roadwork, worker accommodation and services.

²⁰ Engineers and project team are comprised of both on-site and off-site workers. The project team includes BC Hydro construction management and other off-site Site C project staff. An estimate is provided where possible if primary residence is not given.

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**Table F-2 Preliminary Site C Apprentices Snapshot
 (April 2019 to June 2019)**

Month	Number of Apprentices
April 2019	144
May 2019	173
June 2019	189

3 Data is subject to change based on revisions received from the contractors.

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**Table F-3 Current Site C Job Classification
 Groupings**

Biologists and laboratory	Carpenters	Inspectors	Construction managers/supervisors	Crane operators	Electricians	Engineers
Foresters	Health care workers	Heavy equipment operators	Housing staff	Heating, ventilation, and air conditioning	Kitchen staff	Labourers
Mechanics	Millwrights	Office staff	Pipefitters	Plumbers	Sheet metal workers	Truck drivers
Underground mining	Welders	Surveyors	Security guards	Boilermakers	Cement Masons	Crane Operators
Ironworkers						

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**Table F-4 Indigenous Inclusion Snapshot
 (April 2019 to June 2019)**

Month	Number of Indigenous Workers
April 2019	283
May 2019	346
June 2019	361

8 The information shown has been provided by BC Hydro's on-site²¹ construction and
 9 non-construction contractors and their subcontractors that have a contractual
 10 requirement to report on Indigenous inclusion in their workforce.

²¹ On-site includes work performed on Site C dam site, transmission corridor, reservoir clearing area, public roadwork, worker accommodation and services.

1 Employees voluntarily self-declare their Indigenous status to their employer and
2 there may be Indigenous employees that have chosen not to do so, therefore, the
3 number of Indigenous employees may be higher than shown in the table.

4 As with any construction project, the number of workers, and the proportion from any
5 particular location, will vary month-to-month and also reflects the seasonal nature of
6 construction work. The number of workers will also vary as a contract's scope of
7 work is completed by the contractor.

8 ***Women***

9 In June 2019, there were 538 women working for Site C construction and
10 non-construction contractors. The number of women was provided by
11 on-Site Construction and non-construction contractors and engineers that have a
12 contractual requirement to report on the number of women in their workforce.

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Appendix G

Site C Construction Schedule

Site C Construction Schedule

October 2018
80418-1060

Construction Activity	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Dam Site Area											
Clearing: dam site		■	■								
Access roads at the dam site		■	■								
Worker accommodation		■	■								
Peace River construction bridge		■									
Excavation and material relocation		■	■	■	■	■	■	■	■		
Cofferdams and diversion tunnels			■	■	■	■	■	■	■		
Earthfill dam					■	■	■	■	■	■	
Roller-compacted-concrete buttress				■	■	■	■	■	■		
Generating station and spillways				■	■	■	■	■	■	■	
Turbines and generators				■	■	■	■	■	■	■	
Substation				■	■	■	■				
Powerhouse transmission lines							■	■			
Viewpoint construction/landscaping		■	■								
Demobilization and site reclamation										■	■
Roads and Highways*											
Public road improvements											
240 Road		■	■								
269 Road		■	■								
271 Road			■	■							
Old Fort Road		■	■								
Highway 29 realignment											
Cache Creek West					■	■	■	■	■		
Cache Creek/Bear Flat					■	■	■	■	■		
Halfway River					■	■	■	■	■		
Dry Creek						■	■	■			
Farrell Creek							■	■	■		
Farrell Creek East							■	■	■		
Lynx Creek							■	■	■		
Peace River / Reservoir Area*											
Clearing: Lower reservoir and Moberly Drainage		■	■	■	■						
Clearing: Eastern reservoir					■	■					
Clearing: Middle reservoir					■	■	■	■			
Clearing: Western reservoir							■	■	■		
River diversion							■	■	■		
Reservoir filling and operations										■	■
Transmission Works*											
Transmission line clearing					■						
Transmission line construction					■	■	■	■	■	■	
Extension of Peace Canyon switchyard				■	■						
Hudson's Hope Shoreline Protection											
Hudson's Hope Berm/ DA Thomas Road upgrades						■	■	■			
Production & Transport of Materials											
85th Avenue Industrial Lands				■	■	■	■	■	■	■	
Portage Mountain Quarry					■	■	■	■	■		
West Pine Quarry			■	■	■	■	■	■	■	■	
Wuthrich Quarry		■	■	■	■	■	■	■	■	■	

The construction schedule is indicative only and subject to change. The purpose of the schedule is to illustrate the general sequence of construction activities, but the dates and schedule may change.
* Timelines do not include site preparation or wood disposal.