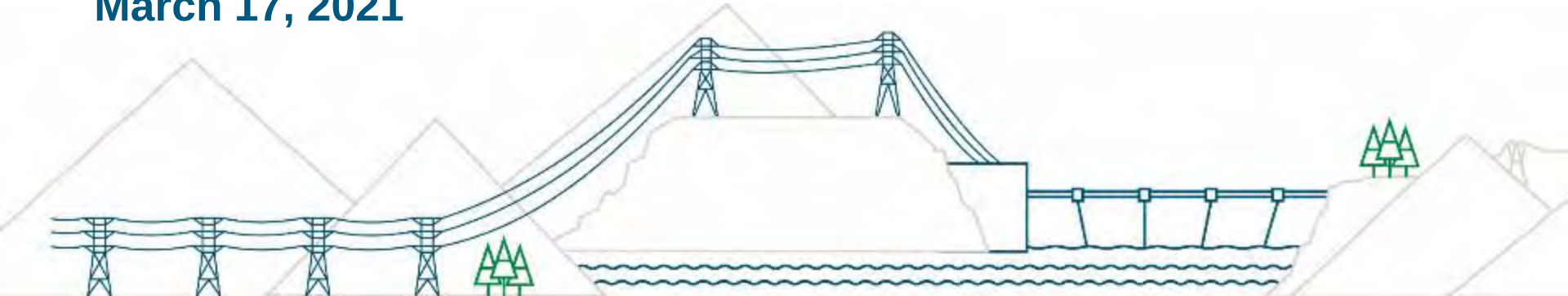


Site C Clean Energy Project

Regional Community Liaison Committee Project Briefing

March 17, 2021



On dam site construction update



On dam site construction update

Main Civil Works

- Stage 2 cofferdams – upstream and downstream
- Dewatering centre section and fish salvage
- Core trench & earthfill dam
- Bar Island excavations
- Approach channel excavations
- Roller compacted concrete (RCC)

Powerhouse, intakes, penstocks, and spillway

- Powerhouse structural steel placement
- Intakes and penstocks installation
- Spillway

Foundation enhancements

Turbines and Generators

- Equipment delivery – runners
- Installation of equipment units 1-3

Main Civil Works

Stage 2 cofferdams – upstream and downstream



Fish salvage



Date & Time: Thu, Feb 25, 2021, 11:27:06 MST



Fish released downstream of the dam



Right Bank core trench

Left Bank core trench

Bar Island – October 18, 2020



Bar Island – November 12, 2020



Bar Island – February 3, 2021



Approach channel



Dam buttress roller compacted concrete placement



Dam buttress roller compacted concrete placement



Powerhouse, penstocks, intakes, and spillway





Powerhouse structural steel installation



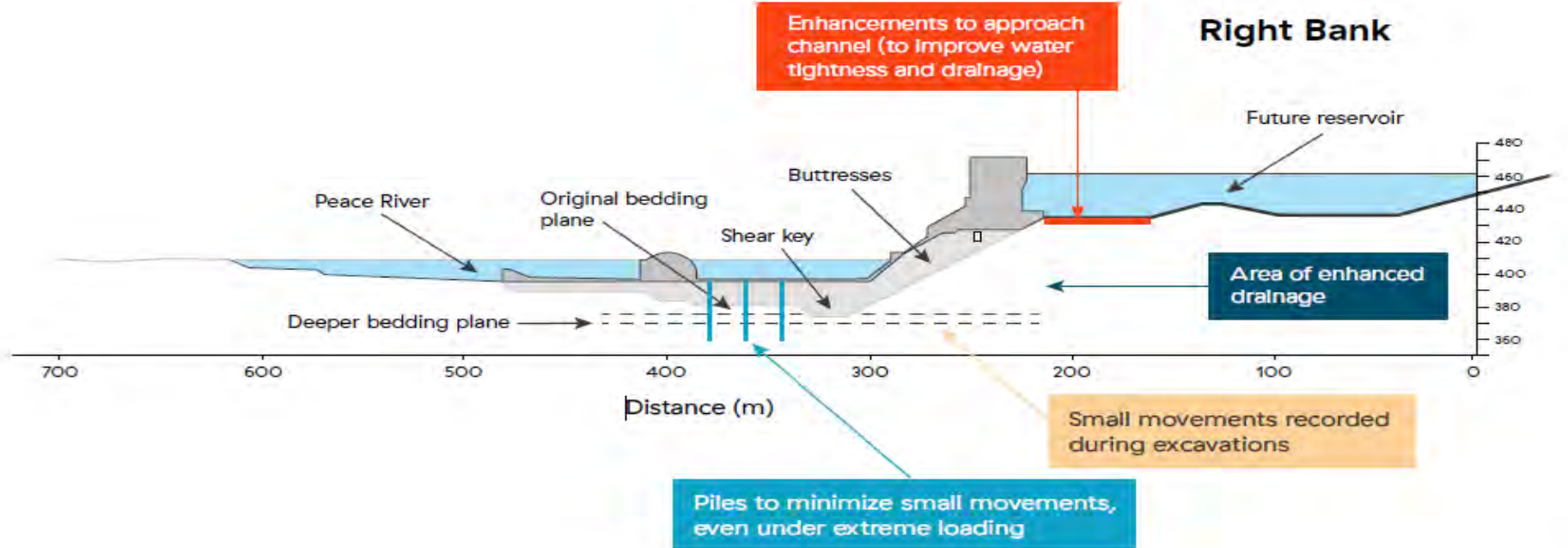
Intakes and penstocks installation

Spillway



Spillway stilling basin





Turbines and Generators - First turbine runner delivered to site



Powerhouse unit turbine area





Powerhouse – stay ring lowered into unit 1

Off dam site construction update

Transmission work

Highway 29 realignment

Hudson's Hope shoreline protection

Reservoir clearing work

Portage Mountain Quarry update

Transmission – Installing a Helical Pile foundation



Transmission – Installing a guyed tower



Transmission - Installing a self-supporting tower



01/16/2021 13:13

Highway 29 realignment segments



Construction Schedule Start to Finish

Lynx Creek – 8.1 km	2019 to 2023
Dry Creek - 1.4 km	2020 to 2022
Farrell Creek – 1.9 km	2020 to 2023
Farrell Creek East – 3.0 km	2021 to 2023

Halfway River – 3.7 km	2018 to 2023
Cache Creek West – 4.0 km	2018 to 2020
Cache Creek East – 8.6 km	2019 to 2023

Highway 29 realignment – Cache Creek east



Highway 29 realignment – Cache Creek east temporary construction bridge



Date & Time: Thu, Mar 04, 2021, 11:01:09 MST
g2 a installed
AFachler/McElhanney/Hwy 29 Halfway

Highway 29 realignment – Installing the last steel girder

Highway 29 realignment – Girder installation complete



Highway 29 realignment – Farrell Creek (facing east)



Highway 29 realignment – Farrell Creek (facing west)



Highway 29 realignment – Farrell Creek pier one



Highway 29 realignment – Dry Creek



Highway 29 realignment - Lynx Creek artist rendering



Highway 29 realignment – Lynx Creek



Shoreline protection – toe berm

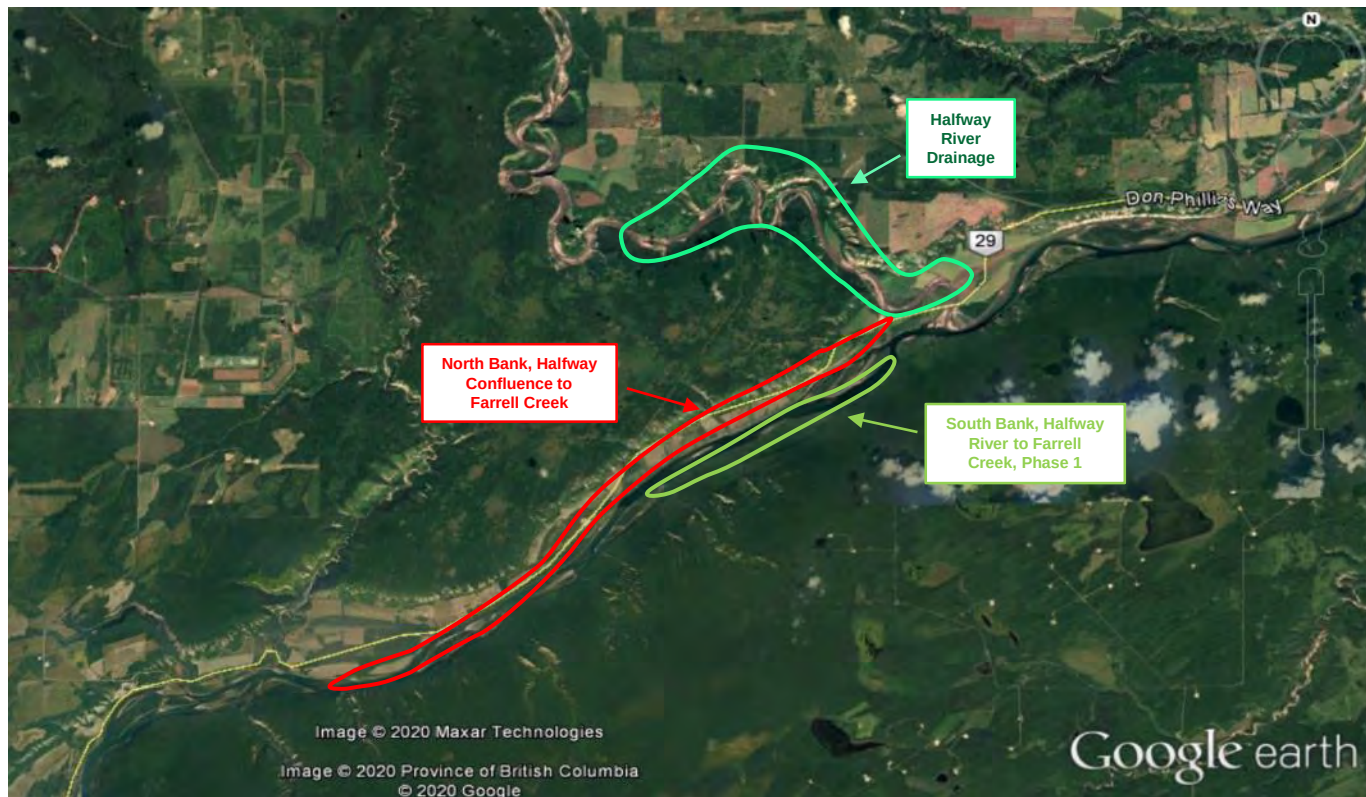


Hudson's Hope shoreline protection laydown area



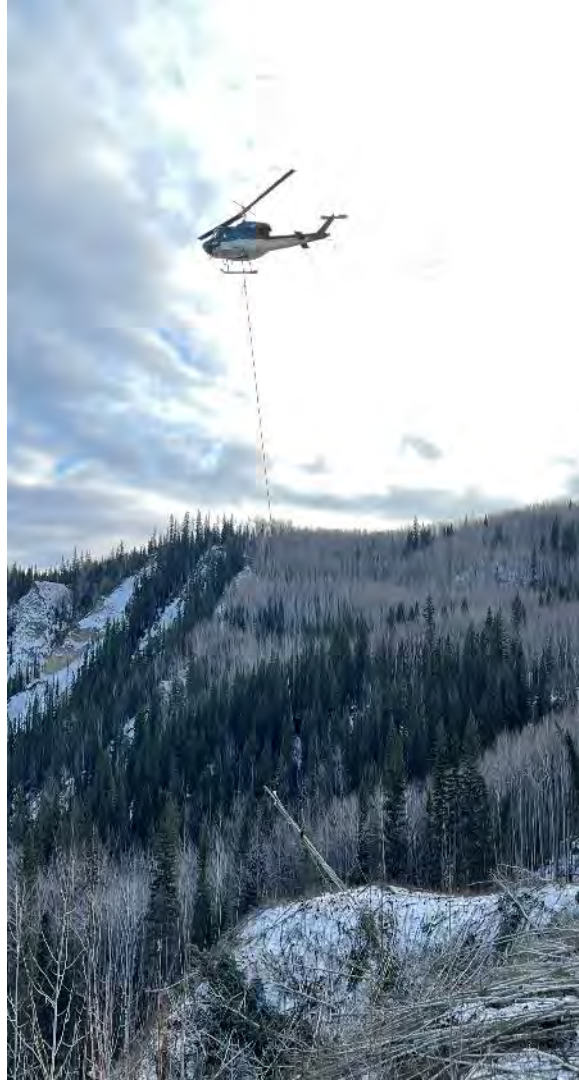
Shoreline protection - spreading filter material on the toe berm





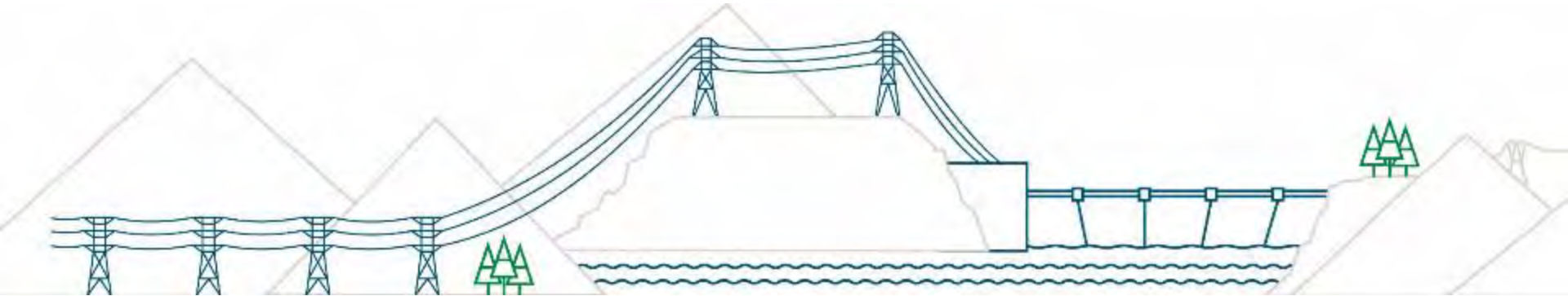
Fall Winter Clearing work:

- Halfway River Drainage
- Western Reservoir South Bank, HR to FC Phase 1
- Western Reservoir North Bank, HR to FC



EAC Amendment Update

Karen von Muehldorfer



EAC Amendments Update

EAC Amendments Issued	EAC Amendments In Progress	Anticipated EAC Amendments
1) Generating Station and Spillway design changes 2) Highway 29 – Halfway River Bridge design change 3) Use of West Pine Quarry as a materials source for Highway 29 realignment and Hudson's Hope berm 4) Selective use of machinery to clear in riparian areas 5) Worker Camp Expansion 6) Highway 29 Cache Creek Revised Alignment 7) Halfway River East Borrow Source	N/A	1) 85th Avenue – hauling material to dam site in event of conveyor breakdown 2) Eastern Reservoir Boat Launch Location (Halfway River)

85th Ave EAC Amendment

Reason for Request:

- ~3 million m³ of this material must be transported to the dam site area for the approach channel and earthfill dam
- Transport of material to the dam site can only take place during warmer seasons
- Stoppages to the delivery of material to the dam site during this 7-month window could result in significant construction delays
- Moving material via trucks will offset potential construction impacts on these components of the Project.



85th Ave EAC Amendment

DRAFT EAC Amendment Request:

- Shared with Indigenous groups, local governments, MOTI, EAO and local residents in January 2021
- Indicated BC Hydro would be hauling approximately 10 days per season (April to October) for maintenance, and for longer periods when the conveyor was not operational due to mechanical breakdowns
- Haul Route: from 85th Avenue/Shaman Industrial Way to the Dam Site via Old Fort Road, 240th Road, and 269th Road to Gate A



85th Ave EAC Amendment

Draft EAC Amendment Request:

- PRRD, City of Fort St. John and local resident feedback on draft EAC Amendment Request:
 - Questions about alternatives (stockpiling material on site, constructing another conveyor, constructing road beside till haul conveyor)
 - Concerns about noise, air quality, traffic impacts, and safety

85th Ave EAC Amendment

Revised EAC Amendment Request - Alternatives to Hauling:

- ***Sourcing material from another till location:***
 - 85th Avenue Industrial Lands is the best source of glacial till
 - 85th Avenue is also close enough to the dam site to transport material via conveyor
- ***Constructing an Additional Till Conveyor:***
 - Would require the widening of the current right-of-way
 - Impacts on wooded areas, agricultural land reserve, private property owners adjacent to the right-of-way.
- ***Hauling on Service Maintenance Road:***
 - Would require both upgrading of the road base to accommodate haul truck loads, and widening of the right-of-way to accommodate two-way traffic.
 - Impacts on wooded areas, the agricultural land reserve and private properties.
 - Hauling on non-paved road may cause dust levels adverse to human health

85th Ave EAC Amendment

Revised EAC Amendment Request – Mitigation Measures

- ***Air Quality:***

- Cover truck loads, check truck tires for rocks and dislodge as required
- Keep paved road clean by water flushing
- Wet sweep to dislodge soil from trucks/roads
- Apply dust suppressant to gravel roads at borrow pit

- ***Noise***

- Maintain equipment in good working order
- Haul during daytime hours only
- Outfit equipment with appropriate mufflers
- Implement construction communications plan, notifying potentially affected residents

- ***Safety***

- Adhere to all MOTI and Provincial Legislation governing use of legal industrial trucks on public roads
- Adhere to speed limits and adapt to inclement conditions
- Install signage, flagging and traffic personnel as required
- Develop Traffic Management Plan in accordance with MOTI requirements

85th Ave EAC Amendment

Revised EAC Amendment Request Reflects Revised Haul Route



85th Ave EAC Amendment

Revised EAC Amendment Request Reflects Revised Contingency Hauling Proposal

No hauling required during periods of regular or planned maintenance.

“Haul trucks may be required to transport material from 85th Avenue Industrial Lands to the dam site area via public roads **when the conveyor is not operational due to events beyond BC Hydro’s control**. Hauling may commence when the conveyor is expected to be not operational for more than three days.”

85th Ave EAC Amendment

Revised EAC Amendment Request Reflects Revised Contingency Hauling Proposal

Potential Causes of Conveyor System Downtime Triggering Need to Haul:

- Vandalism
- Extreme and prolonged inclement weather
- Equipment repair delay/disruption
- Expertise disruption
- Localized fires
- Vehicle, equipment, or human accident
- “Force Majeure” or “Act of God” events

85th Ave EAC Amendment

Next Steps

- Final EAC Amendment Request to be submitted to EAO Week of March 15th
- Opportunities during EAO Amendment Review process to provide comment on request

Halfway East Boat Launch Location EAC Amendment



Halfway East Boat Launch Layout

- Replaces the existing launch at Halfway River and support boat access to and from the new reservoir.
- Replacement boat launch design will include
 - a double-wide boat ramp,
 - parking lot,
 - a day-use site with picnic area
 - inclusively accessible toilets.



Halfway East Boat Launch Location EAC Amendment Process

Next Steps

- Draft EAC Amendment Application shared with Indigenous groups, local governments and stakeholders (RCLC) for review and comment
- Submission of final EAC Amendment Request to EAO mid April 2020

Air Quality Monitoring and Public Complaint Response

Molly Brewis and Lindsay Routledge



Project Overview

Roads & highways

- Upgrades to 240, 269, 271 and Old Fort Roads
- Realignment of six segments of Highway 29

Hudson's Hope shoreline protection

- Upgrades to DA Thomas Road
- Construction of a berm along the shoreline
- Re-paving of Clarke Ave, if required

Peace River / Reservoir area

- Public safety signs and beacons installed upstream and downstream of the dam site
- Clearing activities, river diversion and reservoir filling

Production & transport of materials

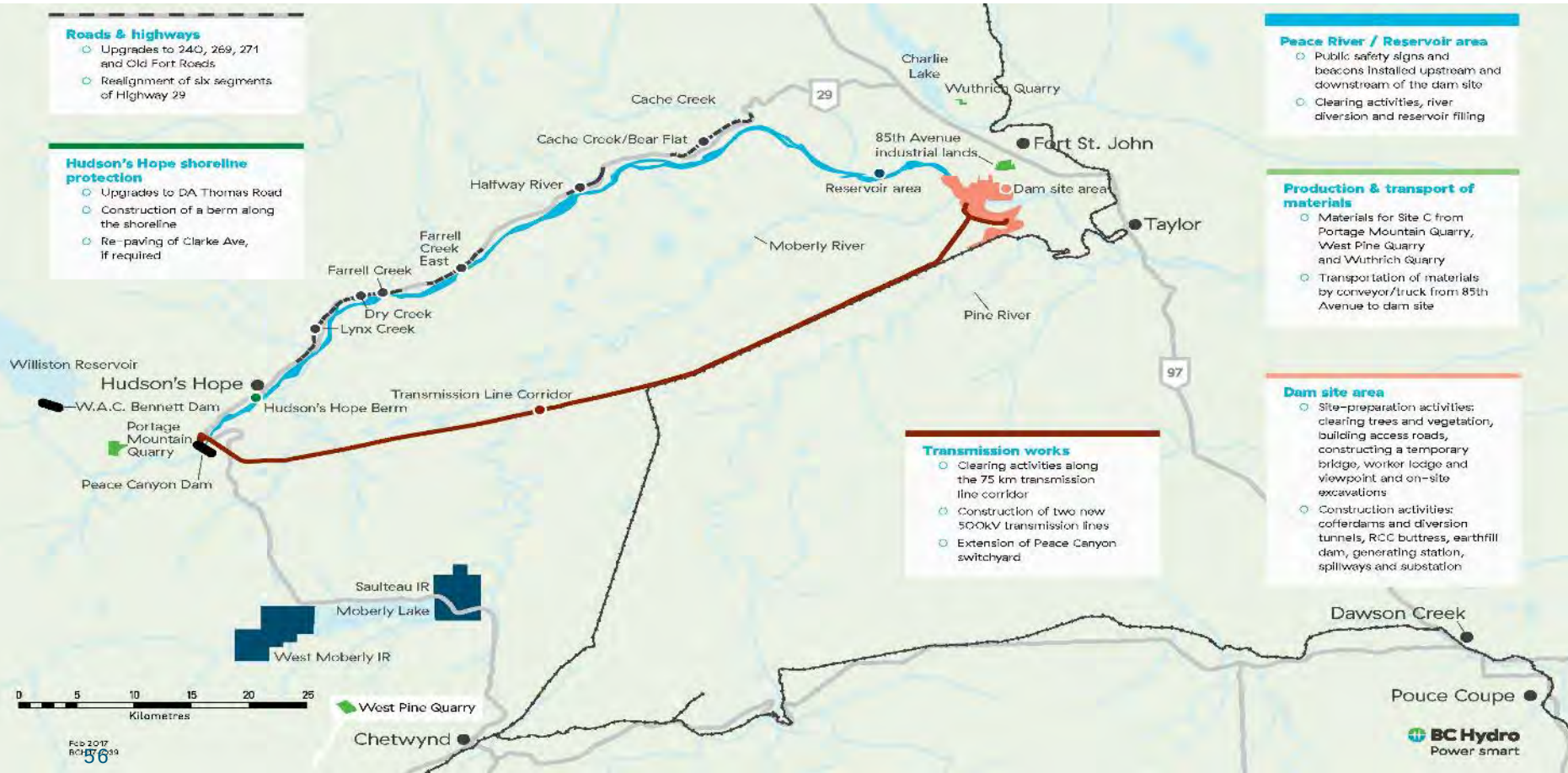
- Materials for Site C from Portage Mountain Quarry, West Pine Quarry and Wuthrich Quarry
- Transportation of materials by conveyor/truck from 85th Avenue to dam site

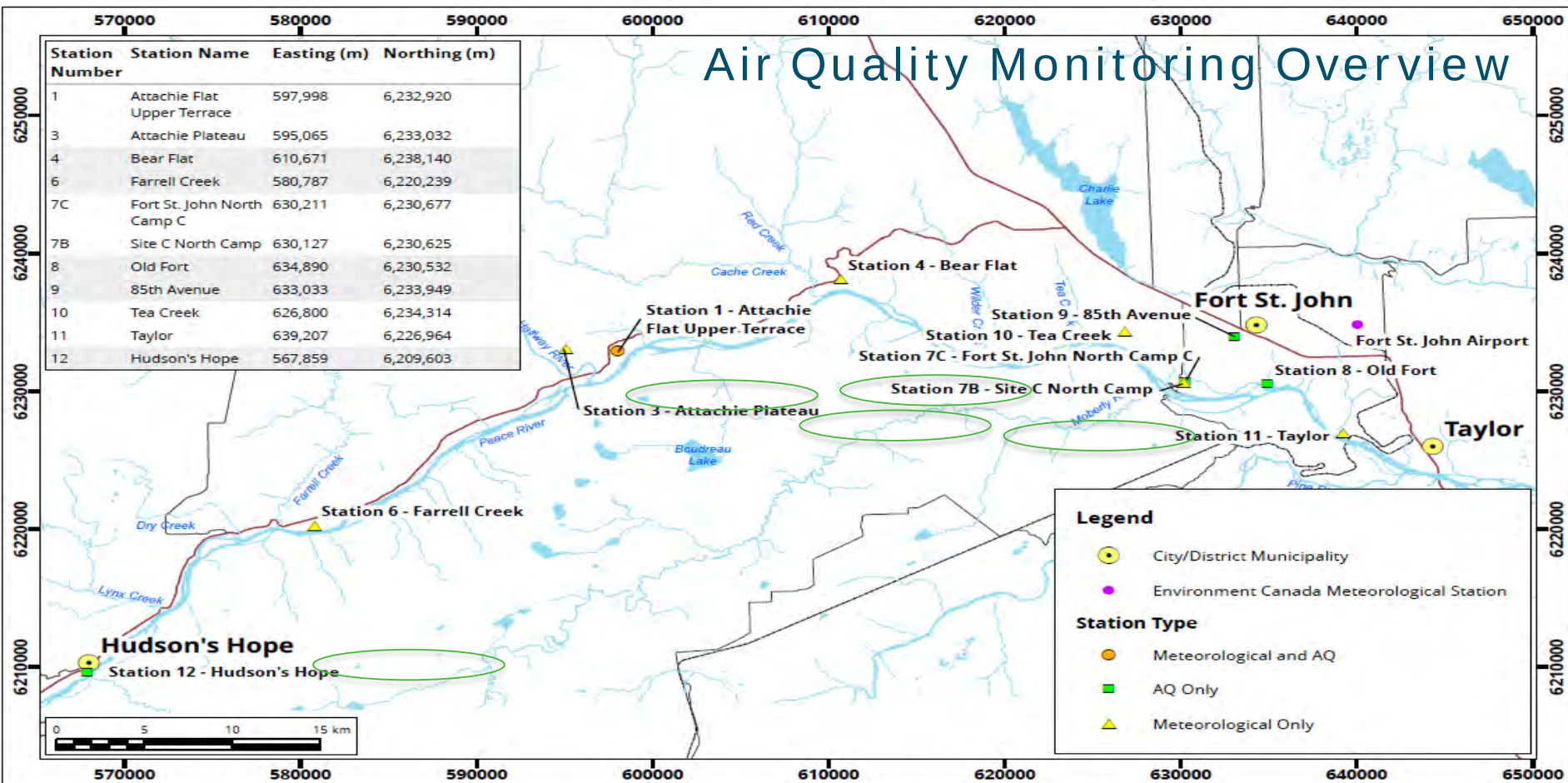
Dam site area

- Site-preparation activities: clearing trees and vegetation, building access roads, constructing a temporary bridge, worker lodge and viewpoint and on-site excavations
- Construction activities: cofferdams and diversion tunnels, RCC buttress, earthfill dam, generating station, spillways and substation

Transmission works

- Clearing activities along the 75 km transmission line corridor
- Construction of two new 500kV transmission lines
- Extension of Peace Canyon switchyard





BC Hydro - Site C Meteorological and Air Quality Stations



Air Quality Stations



Exterior: Peace Valley Attachie Flat Upper Terrace



Interior: Site C North Camp



PM2.5
smoke

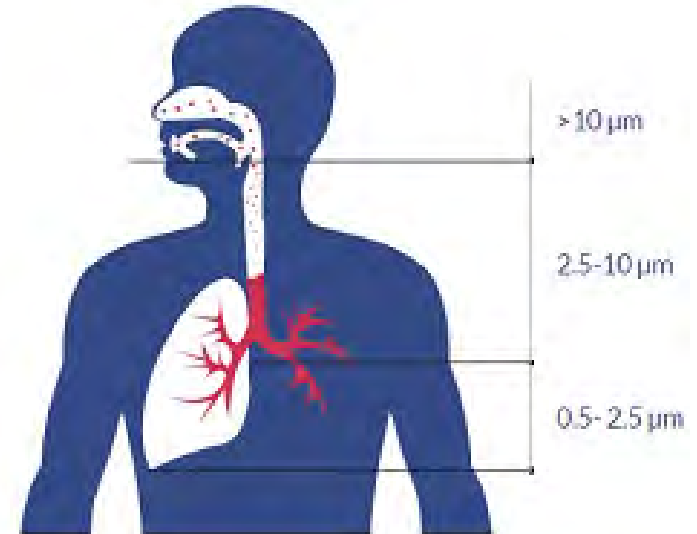
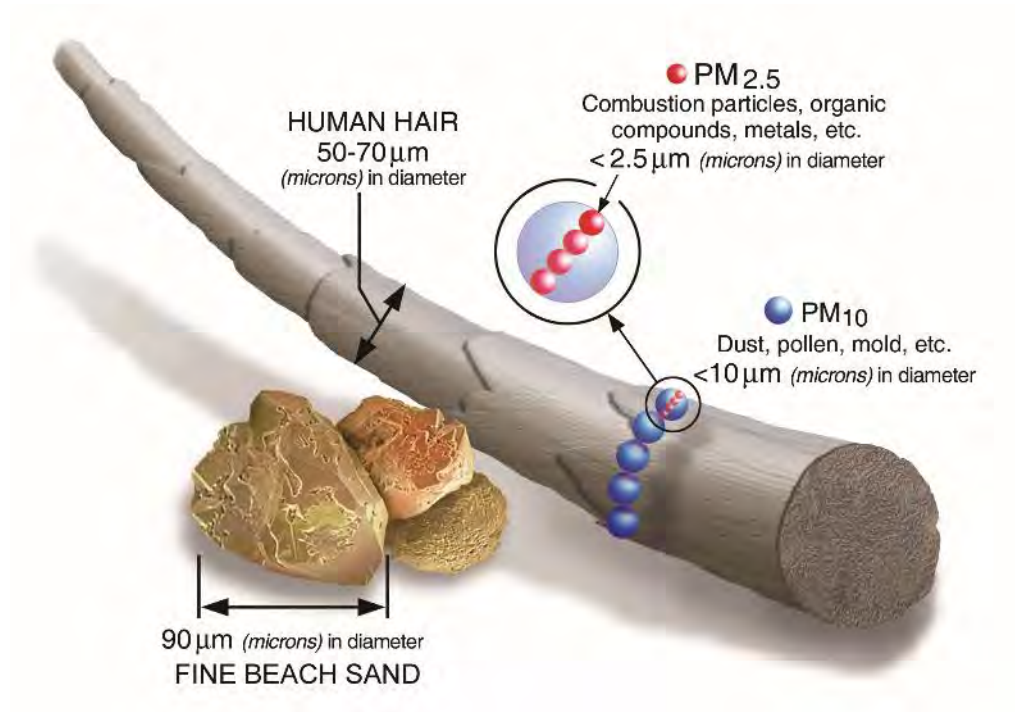


PM10
dust



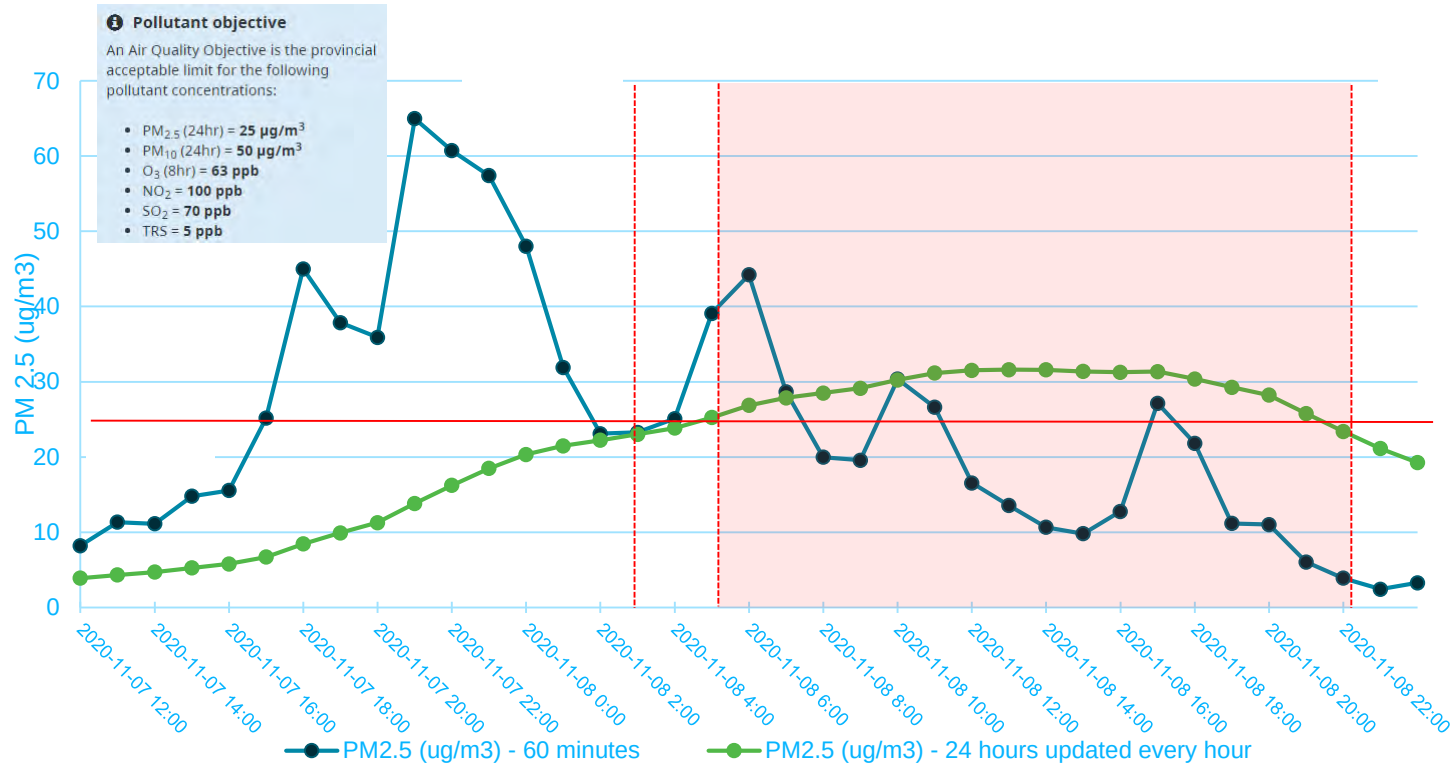
NO₂, SO₂, CO
exhaust

Particulate Size



Source: [WHO](#)

Site C Automated Alerting System



Site C Contractor Response



Drop height reductions (< 2 m)



Speed limits



Load inspections



Hydroseeding



Dust suppressants



Skeleton buckets

Public Data Access

Google "[northeast air zone](#)"

Interactive Map



Use our [interactive map](#) to see an overview of air monitoring station readings from across the province. A [mobile device-friendly version](#) is also available.

Individual Air Monitoring Stations

1. [Bessborough 237 Road](#)
2. [Farmington Community Hall](#)
3. [Fort St John 85th Avenue](#)
4. [Fort St John Key Learning Centre](#)
5. [Fort St John North Camp](#)
6. [Fort St John Old Fort](#)
7. [Hudsons Hope Dudley Drive](#)
8. [Kwoen Gas Plant](#)
9. [Peace Valley Attachie Flat Upper Terrace](#)
10. [Pine River Gas Plant](#)
11. [Pine River Hasler](#)
12. [Taylor South Hill](#)
13. [Taylor Townsite](#)

Public Data Access – Interactive Map



BC Air Quality

[Air Quality Health Index](#)

[Current air quality data](#)

[Air Quality Advisories](#)

[BC Air Data Archive](#)

Current particulate matter - PM₁₀ (24 hour average) data map

View the latest PM₁₀ data. Data is refreshed every 60 minutes. [View instructions on how to use the map.](#)

Please note that air quality data may be missing for many reasons that are beyond our control including local power or communications outages, instrument calibration cycles or failure.

[AQHI](#)

[PM_{2.5}](#)

[PM_{2.5}\(24hr\)](#)

[PM₁₀](#)

[PM₁₀\(24hr\)](#)

[O₃](#)

[O₃\(8hr\)](#)

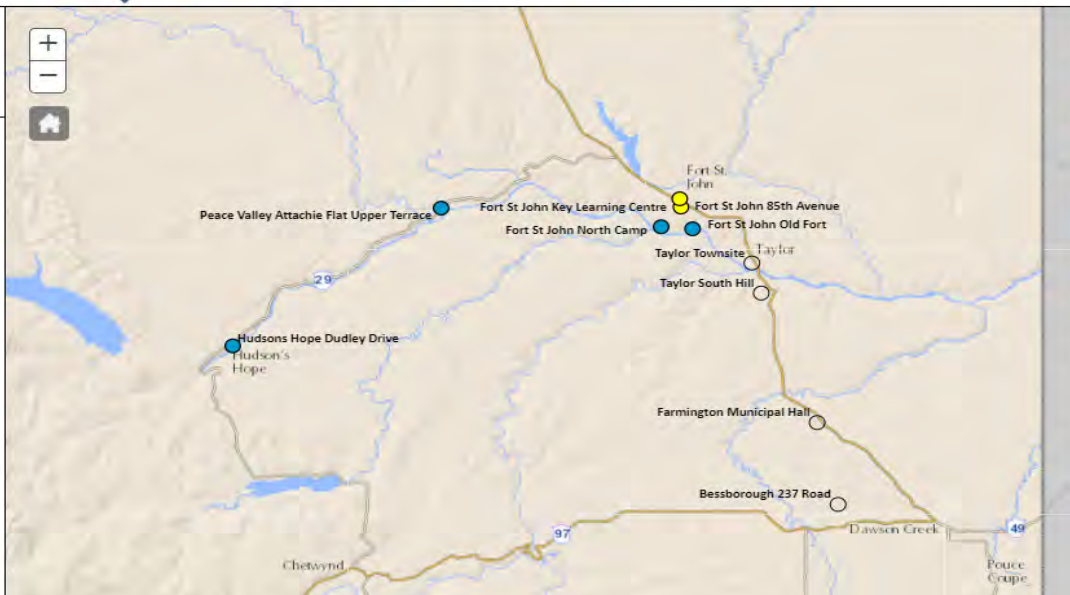
[NO₂](#)

[SO₂](#)

[TRS](#)

[All Station Data](#)

1. Select a station on the map



PM₁₀ µg/m³ (24hr)

50 +
* Exceeding 24-hr Objective.
25 - 50
0 - 25
No PM ₁₀ data

▲ Pollutant Objective

50 µg/m³

An Air Quality Objective is the provincial acceptable limit for PM₁₀ concentration, averaged over a 24-hour period.

[Read more about the province's Air Quality Objectives and Standards.](#)

Public Data Access - Graphical



BC Air Quality

[Air Quality Health Index](#)

[Current air quality data](#)

[Air Quality Advisories](#)

[BC Air Data Archive](#)

Hudsons Hope Dudley Drive - Air monitoring station

Latest data at: **Monday 8 March 2021 03PM (PST)**. Current data is displayed below and you can select each one to view a 30-day graph  of the analyser.

PM2.5
1.9 $\mu\text{g}/\text{m}^3$

PM2.5 (24hr)
6.99 $\mu\text{g}/\text{m}^3$

PM10
17.7 $\mu\text{g}/\text{m}^3$

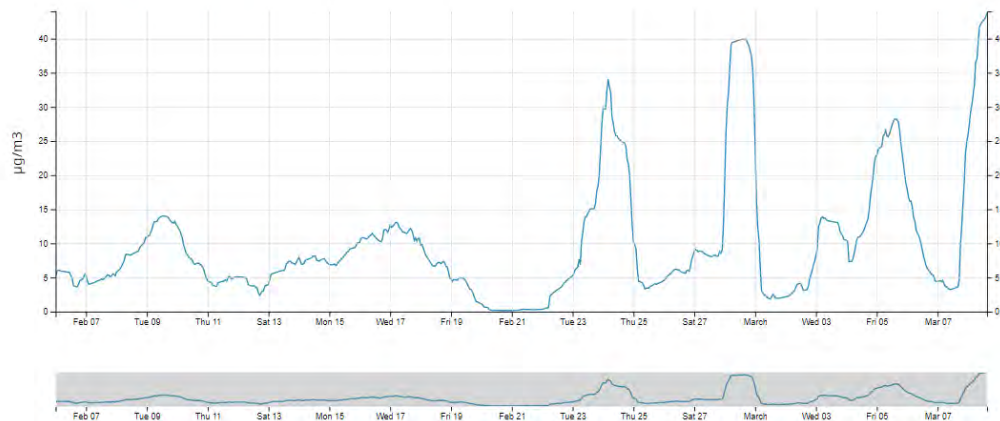
PM10 (24hr)
43.77 $\mu\text{g}/\text{m}^3$

NO2
1.8 ppb

NO2 (24hr)
6.09 ppb

SO2
0.1 ppb

SO2 (24hr)
0.07 ppb



Pollutant objective

An Air Quality Objective is the provincial acceptable limit for the following pollutant concentrations:

- PM_{2.5} (24hr) = 25 $\mu\text{g}/\text{m}^3$
- PM₁₀ (24hr) = 50 $\mu\text{g}/\text{m}^3$
- O₃ (8hr) = 63 ppb
- NO₂ = 100 ppb
- SO₂ = 70 ppb
- TRS = 5 ppb

Pollutant objectives will be highlighted by a **red bar** on the graph. Read more about the province's Air Quality Objectives and Standards.

A **red bar** will appear to show the ambient air quality objective. If that is not visible, the readings lower than that concentration.

Provincial Air Quality Objectives

- Air quality objectives are **non-statutory limits** on the acceptable presence of contaminants in the atmosphere, established by government agencies to protect human health and the environment.
- They are used to **guide air management decisions**.
- They are generally expressed in terms of a **concentration** (e.g., micrograms per cubic metre, or parts per billion) measured **over a specific period of time** (e.g., one hour, 24 hours or one year).
- BC has adopted air quality objectives and standards for a number of contaminants, including Particulate Matter (PM10 and PM2.5), ozone, sulphur dioxide, nitrogen dioxide and carbon monoxide.

Data Sharing with the Ministry of Environment and Climate Change Strategy



Ministry of
Environment and
Climate Change Strategy



MEDIA RELEASE
For Immediate Release - Attention Editor

DUST ADVISORY ISSUED FOR FORT ST. JOHN

(March 28, 2019 9:00 - Prince George). The Ministry of Environment and Climate Change Strategy in collaboration with Northern Health has issued an Air Quality Advisory for Fort St. John due to high concentrations of particulate matter (PM₁₀). This advisory remains in effect until further notice.

Exposure to PM₁₀ is particularly a concern for infants, the elderly and those who have diabetes, and lung or heart disease. Persons with chronic underlying medical conditions should postpone strenuous exercise near busy roads until the advisory is lifted. If you are experiencing symptoms such as continuing eye or throat irritation, chest discomfort, shortness of breath, cough or wheezing, follow the advice of your health care provider.

Real-time air quality observations and information regarding the health effects of air pollution can be found at www.bc.airquality.ca.

Tips to reduce your personal health risk:

- Avoid roads with heavy vehicle traffic.
- Use common sense regarding outdoor physical activity; if your breathing becomes difficult or uncomfortable, stop or reduce the activity.
- Maintaining good overall health is a good way to prevent health effects resulting from short-term exposure to air pollution.
- People with heart or lung conditions may be more sensitive to the effects of poor air quality and should watch for any change in symptoms that may be due to poor air quality exposure. Continue to control medical conditions such as asthma, hay fever, and chronic respiratory disease. If symptoms continue to be bothersome, seek medical attention.
- Keep windows and doors closed, and reduce indoor sources of pollution such as smoking and vacuuming.
- Run an air cleaner. Some room air cleaners, such as HEPA filters, can help reduce indoor concentrations of particulate matter provided the filters are the right size for your home and are kept clean.
- Buildings which have large indoor volumes of filtered outside air may provide temporary relief for those with respiratory and cardiac issues.

Additional Information:

- The current dusty conditions are caused by elevated wind speeds and road traffic stirring up winter traction materials that have accumulated on roadways over the past winter.
- The Provincial Ambient Air Quality Objective for PM₁₀ is 50 micrograms per cubic metre (µg m⁻³), averaged over 24 hours. Current 24-hour average PM₁₀ concentrations for Fort St. John and neighbouring communities are:

Community	Fort St. John	Prince George
24 hr Concentration (µg m ⁻³)	74.3	32.8

- For general information about smoke, poor air quality and your health, contact HealthLink BC available toll free, 24 hours a day, 7 days a week at 8-1-1, or via the web at <http://www.healthlinkbc.ca/kbaltindex.aspx>.
- For information on the effects of air quality on persons with respiratory or cardiac illnesses, contact Northern Health at (250) 565-2150. For additional information and resources related to air quality, visit Northern Health's website at <http://www.northernhealth.ca/>.

Contacts:

Gail Roth
Air Quality Meteorologist
Ministry of Environment and
Climate Change Strategy
250.565.4210

Northern Health Media Line
1.877.961.7724

Mobile Air Quality Monitoring

- To supplement the fixed air quality monitoring station, we have recently rented a **mobile monitoring unit**



Source: <https://www.tsi.com/environmental-dustrak-aerosol-monitor/>

Response to air quality enquiries

- Site C Community Relations receives enquiry and gathers information
- Site C Environment analyzes air quality monitoring station data and, if required, completes localized monitoring to inform decision making
- Site C Construction Management determines resolution and actions it
- Site C Community Relations responds to complainant and makes a record in the Site C enquiries database

Information and notification program



sitecproject.com



[@sitecproject](https://twitter.com/sitecproject)



[1-877-217-0777](tel:1-877-217-0777)



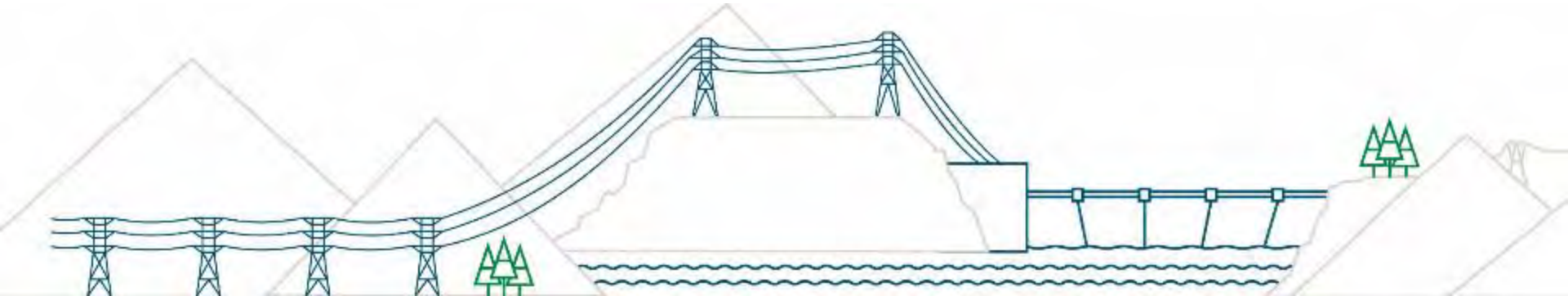
sitec@bchydro.com



www.bcbid.gov.bc.ca

Long Term Regional Benefits

Nancy Pepper



Regional Economic Benefits - Construction

Based on the analysis in the Environmental Impact Statement (2012), the region is expected to experience the following economic benefits during construction:

- Direct expenditures on goods, services, and wages of \$226 million
- Increased output (value of industry production) of \$323.9 million

2020 Q3 Regional Business Participation

Companies engaged by BC Hydro and Site C contractors to provide goods & services in relation to Site C construction between July – September 2020

Community	Number of Businesses	Community	Number of Businesses
Baldonnel	2	Montney	1
Cecil Lake	1	Pink Mountain	1
Charlie Lake	28	Pouce Coupe	5
Chetwynd	58	Prince George	42
Dawson Creek	44	Rolla	1
Fort Nelson	2	Rose Prairie	2
Fort St. John	479	Taylor	10
Hudson's Hope	10	Tumbler Ridge	4
Mackenzie	2	Wonowon	2
Moberly Lake	8		
Total		702	

Mitigation - Construction

Selection of construction phase mitigation for Project impacts:

- Public road pavement monitoring
- Canyon Drive brake check
- Traffic Management Plan
- Air quality monitoring
- Noise complaint response process
- Surface water monitoring
- Drinking water well monitoring
- Temporary fish passage
- Fish habitat enhancement
- Fish monitoring
- Compensation for directly impacted landowners
- Site C Emergency Planning Guide
- On-site health clinic
- Armoring and weighting the Charlie Lake Outfall
- Heritage and archaeological inventory and impact assessment and collection of artifacts
- Creating new wetlands and restoring historically impacted wetlands
- Wildlife monitoring
- Build wildlife habitat structures
- Revegetation

Legacy Benefits Agreement

- Legacy benefits were negotiated with the PRRD Board separate from Project mitigation
- The Legacy Benefit Agreement was signed in 2013 with \$2.4 million paid annually for 70 years, indexed to inflation
- Funding distributed between communities and rural areas based on a formula determined by the PRRD Board



Grants-in-Lieu-of-Taxes During Operations

- BC Hydro pays grants-in-lieu-of-taxes as directed by the provincial government.
- Based on current provincial direction, BC Hydro anticipates making the following estimated payments in the first year of operations (in 2012 dollars):
 - \$1.3 M to local governments for the generating station and
 - \$800,000 for school taxes for transmission assets to the provincial government.

Projected Population and Community and Social Mitigation Planning

- Community and social mitigation measures for the Project were based on estimates of the impact of the Project workforce exceeding the population growth already planned for by the City of Fort St. John and the PRRD.
- Both jurisdictions have experienced lower population growth than estimated without the Project.

	2020	
	Fort St. John	PRRD
BC Stats Population	22,283	67,284
Estimated Population without Site C	23,701	72,263
Difference	-1,418	-4,979

BC Housing Building



Margaret “Ma” Murray Daycare



Education and Training

- \$1 million to Northern Lights College Foundation to support trades and skills training through the creation of student bursaries.
- \$184,000 to Northern Opportunities for the creation of a school district career counsellor position that helped students transition into trades and career training.
- \$100,000 to the North East Native Advancing Society in support of trades training under its North East Aboriginal Trades Training program.
- \$175,000 over five years to Northern Opportunities for its pre-apprenticeship program.
- Work with contractors to identify and increase apprenticeship opportunities and participate in regional workforce training initiatives.



Peace Island Park Serviced RV Sites

Highway 97 intersection and lighting improvements in Taylor



Highway 29 Improvements





Old Fort Road Repaving and Shoulder Widening

Old Fort Road Corner Realignment





BC Hydro Peace Agricultural Compensation Fund

Outdoor Recreation

An aerial rendering of a proposed outdoor recreation facility. The facility is situated on a peninsula or shoreline, bordered by a dense forest of green trees. A large, rectangular, light-brown paved area serves as a boat launch and parking lot, filled with numerous small boats and cars. A paved road curves around the facility, with a car and a boat visible on it. The facility is adjacent to a body of water, with a rocky shoreline and a small dock visible in the distance.

- Two boat launches with day use sites
- One small craft launch with day use site
- Rustic Recreation Site Fund
- Reservoir Recreation Opportunities Plan

Jobs and business opportunities



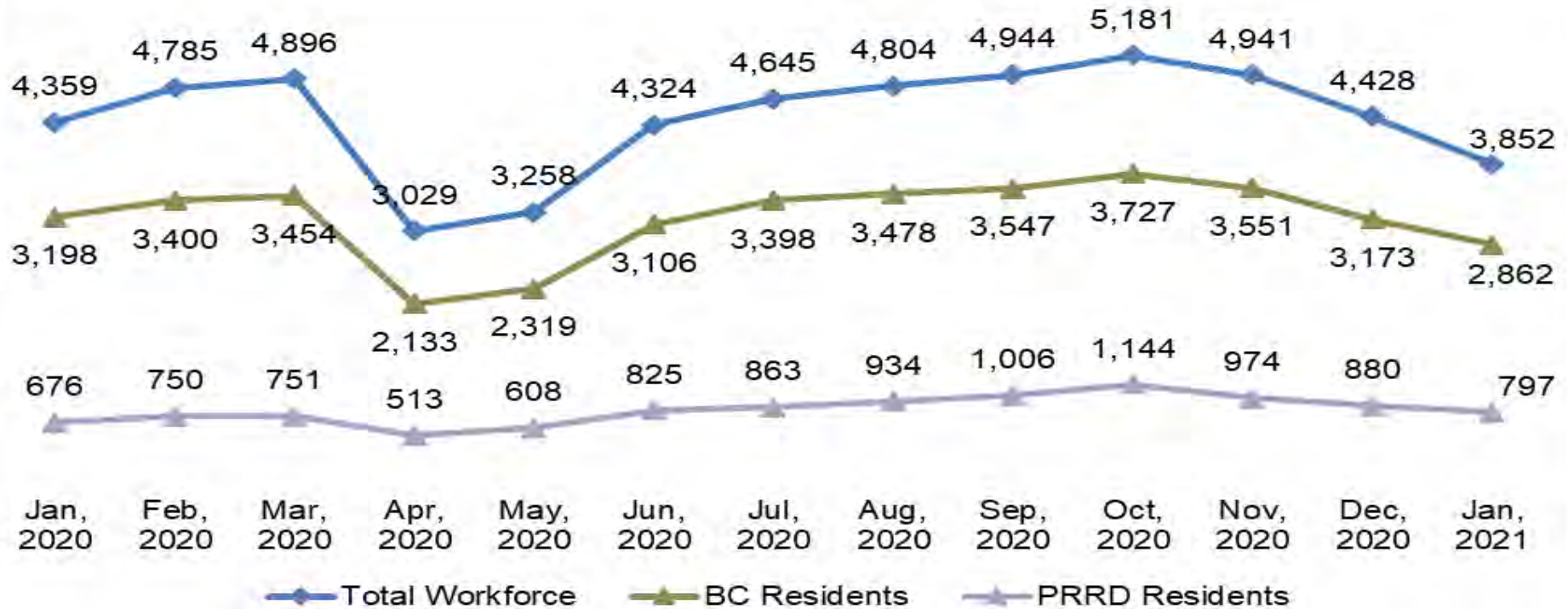
Employment statistics

Note: The January workforce numbers reflect the the Provincial Health Officer order for large-scale industrial camps to gradual resume construction activities.

- BC Hydro requires all major contractors to report employment information.
- Total of **3,852** workers in January 2021; **2,862** from B.C (74%). Total of **797** workers from PRRD (25%).

Site C Employment Statistics – January 2021			
	# of Total Workers	# of BC Primary Residents	% of BC Workers
Construction and Environmental Contractors	3,136	2,197	70%
Engineers and Project Team	716	665	93%
Total Workforce	3,852	2,862	74%

Site C Jobs Annual Trending (January 2021)



2020 Q4 Regional Business Participation

Companies engaged by BC Hydro and Site C contractors to provide goods & services in relation to Site C construction between October – December 2020

Community	Number of Businesses	Community	Number of Businesses
Baldonnel	3	Pine Pass	1
Charlie Lake	29	Pink Mountain	1
Chetwynd	62	Pouce Coupe	1
Dawson Creek	46	Prince George	50
Fort Nelson	1	Rolla	1
Fort St. John	518	Rose Prairie	1
Hudson's Hope	16	Taylor	8
Mackenzie	2	Tumbler Ridge	3
Moberly Lake	10	Wonowon	3
Montney	1		
Total		757	

