



**Environmental Effects Screening**  
**For Projects Carried Out on Federal Lands or Outside of Canada**  
[\(s.82-83 of the Impact Assessment Act\)](#)

## General Information

**Title of Proposed Project:** Tsay Keh Dene Biomass Energy Project

## Contact Information

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<b>Phone:</b>	343-548-0828
<b>Name of Proponent:</b>	Tsay Keh Dene Nation

## Project Location

<b>Province:</b>	British Columbia
<b>Physical address:</b>	Finlay, River 6, Peace River, BC V0J 3N0
<b>GPS Coordinates:</b>	N56°53'39.84" – W124°57'54"
<b>Status of Land Ownership:</b>	First Nations Reserve Lands
<b>Proximity to Waterbody:</b>	1 km from the Williston Reservoir

## Description of the Current Environment at and Around Project Site

Tsay Keh Dene is located in the Rocky Mountain Trench at the north end of Williston Lake and about 360 km north of Prince George, B.C. The site is located adjacent to and north of Main Street, about 1.1 km east of the Finlay Forest Service Road intersection. The building and structures will have an approximate footprint of 9,975 m<sup>2</sup>, will include grade-supported concrete floor slabs, and will be heated through the 2 winter months. The site is adjacent to an existing gravel road and located in the vicinity of BC Hydro's main distribution line.



The site of the project is on an area that used to house a sawmill building that is now abandoned and the site has been cleared. There will be no clearing of other area for this project. The site surface is levelled and graded.



## Project Background & Purpose

Located in northern British Columbia, the Tsay Keh Dene Nation currently relies on diesel generators, burning more than one million litres of diesel per year, to provide power for their community. The diesel generator system produces significant greenhouse gas emissions and limits the community's ability to expand its power needs for economic growth and meeting its housing demand requirements.

The Tsay Keh Dene Nation seeks to reduce its dependency on B.C. Hydro's diesel generators by building, owning and operating a forest biomass-fueled, combined heat and power energy plant. The project involves installing a biomass heater with an Organic Rankine Cycle turbine to produce power and heat. In addition, the project will also build a forest biomass supply chain and an energy storage system to connect to the BC Hydro power distribution system already in place. The plant will generate 1,200kW of electricity and heat, using forest biomass from the Nation's own forestry operations and wood debris that the Nation must collect and burn from the Williston Reservoir. Once operational, the heat energy produced from the biomass power plant will be used for a district heating system that the community wants to use for greenhouse food production and heating new community buildings.



## General Description of Project

NRCan is in the process of funding \$16 million to the Tsay Keh Dene Nation to build a forest biomass fueled combined heat and power system. There will be 7 structures constructed for this project:

1. The main building will house the combustor (15m x 9m).
2. The organic rankine cycle (ORC) generator and control systems will be situated next to the combustor. (15m x 3m)
3. An e-house will house the protection and control for interconnection to the BC hydro grid (3m x 15m)
4. There will be a pump house for the District Heating System (3m x 7m)
5. A three phase, transformer pad with associated equipment will be built on site near the distribution system (5m x 5m)
6. A fuel processing and conveyor building (15m x 6m)
7. A shed to store biomass will also be constructed (6m x 5m)

In addition, accessory works will be completed such as access roads, mechanical and electrical works, signage and other related works.

The site has been used extensively in the past and is identified as a brownfield site. It has been cleared and graded for its past use as a sawmill. No vegetation needs to be removed. No preparation is required pre-foundation digging and pouring.

Concrete will be poured and digging will occur for the concrete footings. Digging will occur for the pipe runs and cable conduits between buildings. The buildings will be very close to each other. Trenching is also required to lay pipe for the district heating system. All trenching will be in cleared, previously disturbed areas.

An interconnection study has been completed. The ORC generator will generate power at 600V and this will be cabled to the E-House containing the main breaker and full protection and control system to meet BC Hydro's power quality needs. Three phase cables will then be run to the transformer pad which will raise the voltage to distribution level (25kV). Cables will then run up the BC Hydro pole and connect into the distribution line and will cover approximately 3 km of transmission line. PTs, CTs, meters, breakers and disconnects will be incorporated in accordance with BCH interconnection requirements.

## Potential Impact Checklist

Does the Project have the potential to result in:	Yes	No	Briefly Describe the Impact (use bullet points)
Alteration or removal of natural vegetation or wildlife habitat?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Impacts to species covered under the <i>Species At Risk Act</i> or its critical habitat?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Changes to migratory birds and/or their nesting habitat?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	



Changes to a water body, including, but not limited to changes in flow, water level, quality, deposition of silt, soil or other substances into the water, or changes to other characteristic?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Release a polluting substance into the land, water or air?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>In construction some light and heavy equipment emissions and fugitive dust will be produced. This may affect air quality in the immediate vicinity of the project site. However, any effects will be mitigated through construction best management practices (e.g. minimum idling, well maintained equipment etc.)</p> <p>During operation some fugitive dust may be released at the project site during the transfer of wood into the fuel storage unit. This has the potential to affect air quality at that location, but any effect will be transitory and minimal.</p> <p>The biomass plant will burn woody biomass as feedstock. This can be expected to produce emissions. However, with the European design and manufacture of the combustor unit, the biomass plant will burn the feedstock cleanly with almost no visible emissions or odor. Its filtration and combustion parameters will eliminate almost all emissions of particulate matter. Laboratory analysis of feedstock indicates that it can be burned cleanly and efficiently when dry. All applicable air quality and emissions standards will be met.</p>
Involve digging, trenching, or drilling?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Digging is required for footings of buildings (on the perimeter to a depth below the frost line). Trenching is required for the district heating system. The pipes that will convey the heated water and glycol for bioheat will be installed in these trenches. (This is a closed loop system).
Impact to socio-economic and health conditions of people?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Impact to Indigenous rights?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Impact to physical and cultural heritage and/or archaeological sites?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Impact to recreation and land use?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Impacts to air quality?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	As stated above, the plant design will include filters and electrostatic precipitators to reduce particulate matter, volatile organic compounds and hazardous air pollutants to meet all federal and provincial emissions standards
Increased noise exposure?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<p>Delivery and operation of construction equipment will increase ambient noise at the project site. Ambient noise levels will be typical for a small-scale construction project. Best construction management practices will be adopted.</p> <p>The noisiest component is the on-site chipper. (Some chipping in the field is also planned). Chippers have a noise level of 70 to 80 on average. The on-site chipper will be housed in an enclosure designed for noise abatement. The on-site chipper will operate 1 to 3 hours daily (if that often) in the morning hours.</p>



			Noise from other components of the project will be similar to a small scale industrial workshop. The project is located approximately $\frac{3}{4}$ to one kilometre from the nearest building and separated by forest.
Contamination or destruction of country foods?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

**Table 1. Please list each physical work and each corresponding physical activity, as well as potential impacts, proposed standard mitigation measures, residual effects, and any needed monitoring or follow-up. Add additional rows as needed.**

Physical Work	Physical Activity	Potential Impact	Proposed Mitigation Measure	Describe Residual Effect(s)	Proposed Monitoring/Follow-Up Measures
For the following buildings: Combustor Building, Organic Rankin Cycle generator, E- House, Pump House, Transformer pad, Fuel processing and conveyor building, Biomass storage shed. (See section “General Description of the Project” for floor plan dimensions)	Construction (see below)				
Foundations	Excavation	Dust or mud creation. Stockpiles of earth	Dampen dust, allow site to drain of rainwater. Bund the stockpiles and tarp if necessary. At end of job, spread out stockpiled earth across site. If contaminated soils are discovered during excavation work, contaminated soils will be disposed of in accordance with the provincial regulation.	None	None



Foundations	Excavation	Displacement of an artefact that is of historical, archaeological, paleontological or architectural significance	Implement a chance find procedure in the event that previously unidentified physical or cultural heritage features or structures, sites or things of historical, archaeological, paleontological or architectural significance are discovered during excavation work.	None	None
Foundations	Concrete pour	Delivery of concrete products to site from Prince George	Use reputable suppliers with experience of delivery to this area. Set up bunded mixing area	None	None
Pipe, cable and drainage Trenches	Trenching	Temp. stockpiles of earth	Manage the stockpiles as above	None	None
Pipe, cable and drainage Trenches	Lay cable	None	NA	None	None
Pipe, cable and drainage Trenches	Backfill	None	NA	None	None
Steel buildings	Erection	Noise	Fence off the site and wear hearing protection	None	Include fencing in maintenance plan
Steel buildings	Equipment install	Moving heavy equipment	Fence off site and ensure signage exists along with correct PPE for workers. Ensure all heavy machinery is in good working order before entering the construction site to avoid potential leak.	None	None
Plant Operation	Commissioning	Energized equipment	Lock out procedures and PPE. No public access to site	None	
Plant Operation	Timber delivery	Truck on roads and at site, heavy equipment operating	Cordon off safe walking areas and truck routes. PPE for all workers	None	
Plant Operation	Power generation	High pressure/ temperature thermal oil in plant	Very thorough commissioning and training processes to ensure safe operation. Design will meet requirements of Technical Safety BC to operate without	None	



			Steam Plant Operator certification requirement		
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## Accidents and Malfunctions

**Table 2. Please describe any potential accidents or malfunctions, which could have adverse impacts on the environment or factors related to the environment. Provide a description of how these will be mitigated. Add additional rows as needed.**

Accident or Malfunction	Description of Adverse Effect	Measures to Prevent or Remediate Accidents or Malfunctions
Pipe burst	Release of glycol from DHS	Use food grade diluted glycol and insulate/protect pipes
Equipment failure	Release of thermal oil from system	Establish a thorough maintenance program per supplier guidelines and monitor activities to ensure compliance
Equipment failure	Fire	Fire protection system to meet insurer requirements (and sprinkler system will be fed from water tower)
Leaching from stockpiled forestry slash	Could enter site drainage and go into forest	Professionally designed drainage system to separate contaminants from site drainage

## Departmental & Regulatory Coordination

Question	Yes	No	Explanation
Is another federal department or agency conducting its own Section 82/83 impact assessment on this project?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<i>If yes, for each other federal authority, provide:</i> <b>Contact Name:</b> Laurence Provençal-Vincent <b>Department/Agency:</b> Infrastructure Canada <b>Role in assessment:</b> Co-funding department assessor
Will the Project require an approval or issuance of an authorization or permit by a federal regulatory body (e.g., <i>Explosives Act, Fisheries Act, Species at Risk Act, etc.</i> )?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Will the Project require approval, authorization, or licensing (or has already received approval) by a Provincial or Territorial regulatory body?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Has the proponent conducted any preliminary studies such as wildlife and wildlife habitat assessments, assessments for presence of species at risk, characterization of relevant geology, etc.?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

## Indigenous Rights and Knowledge & Community Knowledge



Question	Yes	No	Explanation
Were impacts to Indigenous Rights assessed?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	The biomass plant is wholly situated on a Tsay Keh Dene reserve. No overlapping Indigenous claims exist. Also feedstock from the biomass plant will consist of wood waste from forestry, debris from the Williston Reservoir, and wood from wildfire mitigation projects. This woody biomass will largely be collected within a radius of 100 kilometers of the Tsay Keh Dene reserve. To Tsay Keh Dene's knowledge, no overlapping Indigenous claims exist within this area.
Was Indigenous knowledge incorporated into the assessment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Use of wood waste for energy generation to mitigate wildfire risks (a form of hazard abatement) and to promote forest regeneration is consistent with Indigenous knowledge and values.
Does the Project have the potential to generate any public concern?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Any concerns, if any, are likely confined to the Tsay Keh Dene community. The main concern for any project in the community has been to ensure the project is designed to a high standard, technically and environmentally. We believe these concerns have been met.
Was community knowledge incorporated into the assessment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	See the foregoing.

### Strategic Assessment of Climate Change

Question	Yes	No	Explanation
Will your project result in an increase in greenhouse gas emissions?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

### Assessment Determination

<input type="checkbox"/>	Significant environmental effects are unlikely with the implementation of <u>routine or site-specific mitigation measures</u> .
<input type="checkbox"/>	Significant environmental effects are likely

### Impact Assessment Approval:

Natural Resources Canada

<b>Name:</b>	
<b>Title:</b>	
<b>Date:</b>	



Natural Resources  
CanadaRessources naturelles  
Canada

<b>Decision:</b>	
<b>Rationale:</b>	
<b>Conditions:</b>	<i>The conditions listed here are a requirement for approval of this Section 82/83 impact assessment and must be implemented by the proponent:</i>

Infrastructure Canada

<b>Name:</b>	
<b>Title:</b>	
<b>Date:</b>	

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